3 Properties of low-lying levels in the isotopes from Z= 21 to Z= 36

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3.1 Introduction

In this chapter experimentally established properties of levels in nuclei with mass number Z from 21 to 36 are presented. The nuclei are ordered, firstly, by the Z-number and, secondly, by the atomic mass number A within isotopic chains from lesser to larger values. Only the levels with well-established values of angular momentum J and parity π are included in this compilation. All stable and unstable (with a half-life time of more than one minute) nuclei are presented. Exceptions are isotopes with a half-life time of a few minutes in which only one or two excited levels in accordance with the selection procedure are known. The information on level properties is adapted from the Nuclear Data Sheets and the data base at the National Nuclear Data Center, Brookhaven National Laboratory.

3.1.1 Description of the level schemes

An example of the level scheme is shown in Fig. 3.1. Levels are plotted by horizontal lines, the thick line corresponds to the nuclear ground state. At the left-hand side of the figures information on the total angular momentum J and parity π of the levels is provided as J^π_n. The index $n = 1, 2, \ldots$ indicates whether the state J^π is the first, second, etc., in the total energy spectrum. The excitation energies of the levels relative to the ground state are given in keV at the right-hand side of the figures. The decay of levels by γ-transitions is shown by vertical lines. For each level the transition which has the largest intensity is plotted by a thick line. If a level decays into only one other level, it is also specified by a thick line. At the bottom of each level scheme the values of neutron, S_n, and proton, S_p, separation energies and of mass excess Δ in keV are provided for the ground state.

In a few exceptional cases it was not possible to represent all known levels in the figure for technical reasons. Then the figure is cut at high energies. The information on truncated levels is provided in the table.

3.1.2 Description of the tables

The tables contain basic information on nuclei levels, their population and decay properties. In the first and second columns of the tables the J^π_n quantum numbers and excitation energies (in keV) of the levels are presented, respectively. There is one-to-one correspondence to the same quantities on the left-hand side and right-hand side of the figures. The half-life time of levels, $T_{1/2}$, is given

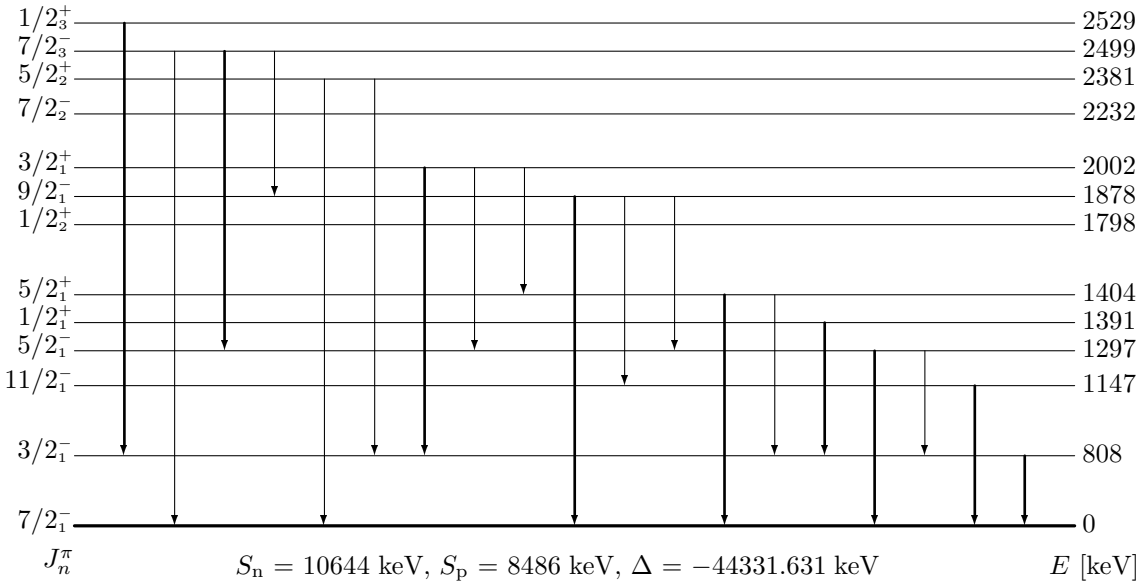


Figure 3.1: Part of the level scheme for ^{47}Sc.

in the third column. The following conventional units are used: y = year, d = day, h = hour, m = minute, s = second, ms = 10^{-3} s, μs = 10^{-6} s, ns = 10^{-9} s, ps = 10^{-12} s, fs = 10^{-15} s. For levels above the particle threshold the width of levels in eV is given.

Other information on properties of the levels is collected in the last column of the tables. The following information is provided:

1) quadrupole, Q, (in barn) and magnetic, μ, (in nuclear magnetons, μ_n) moments of the ground state and excited levels;

2) $\log ft$ values for β^- (β^-) decays or β^+ and electron capture decays (β^+). In brackets the quantum numbers J^π of the level in neighboring nuclei, (A, $Z-1$) or (A, $Z+1$), respectively, from which the decay takes place are specified;

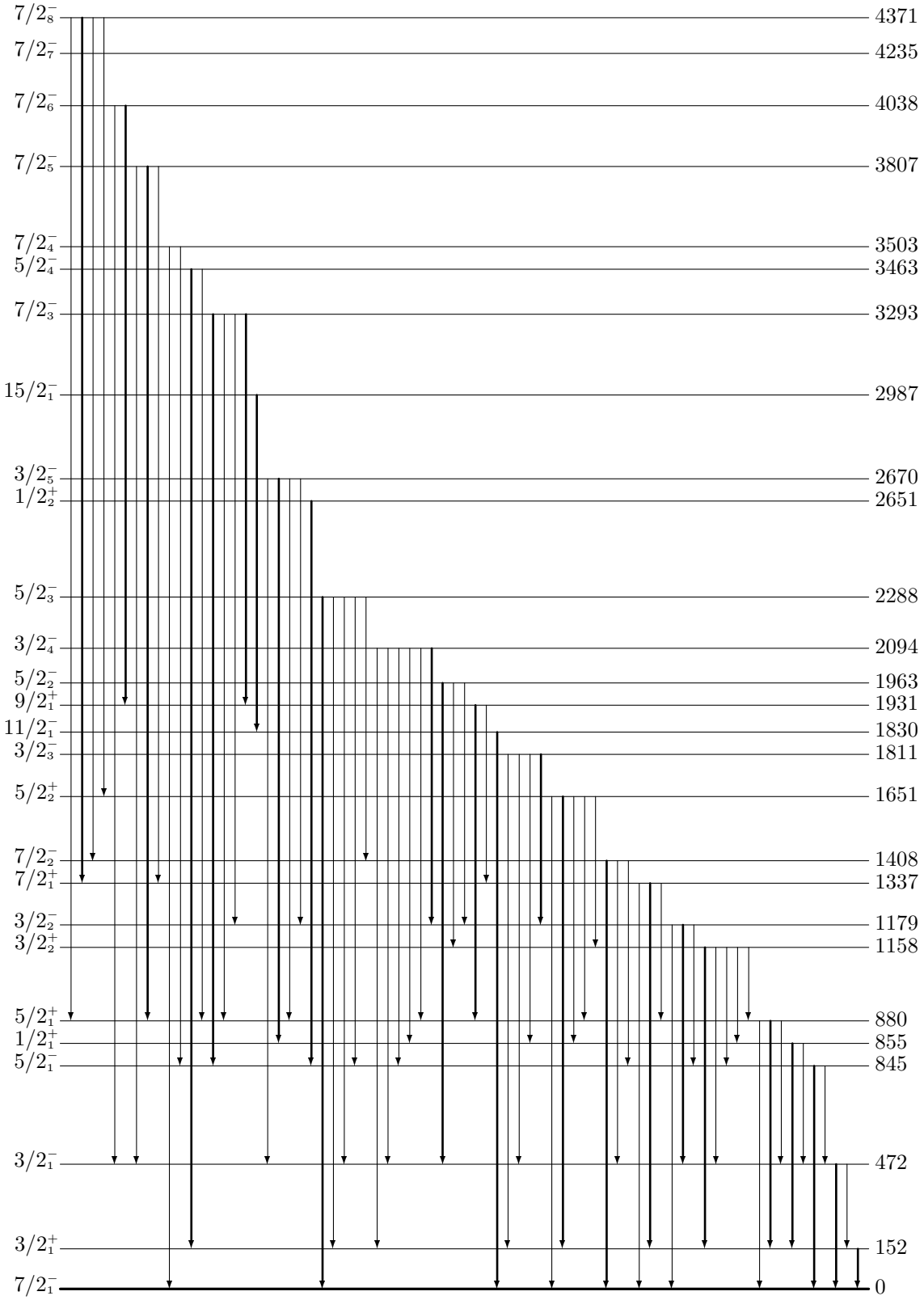
3) reduced transition probabilities $B(\mathrm{E}\lambda \to J_n^\pi)$ or $B(\mathrm{M}\lambda \to J_n^\pi)$ for γ-decay of the level into levels at lower energies with quantum numbers J_n^π. They are given in Weisskopf units (W.u.):

$$B(\mathrm{E}\lambda)_\mathrm{W.u.} = \frac{1}{4\pi}\left(\frac{3}{\lambda+3}\right)^2 (1.2 \cdot A^{1/3})^{2\lambda} \quad \mathrm{e}^2\ \mathrm{fm}^{2\lambda}\ ,$$

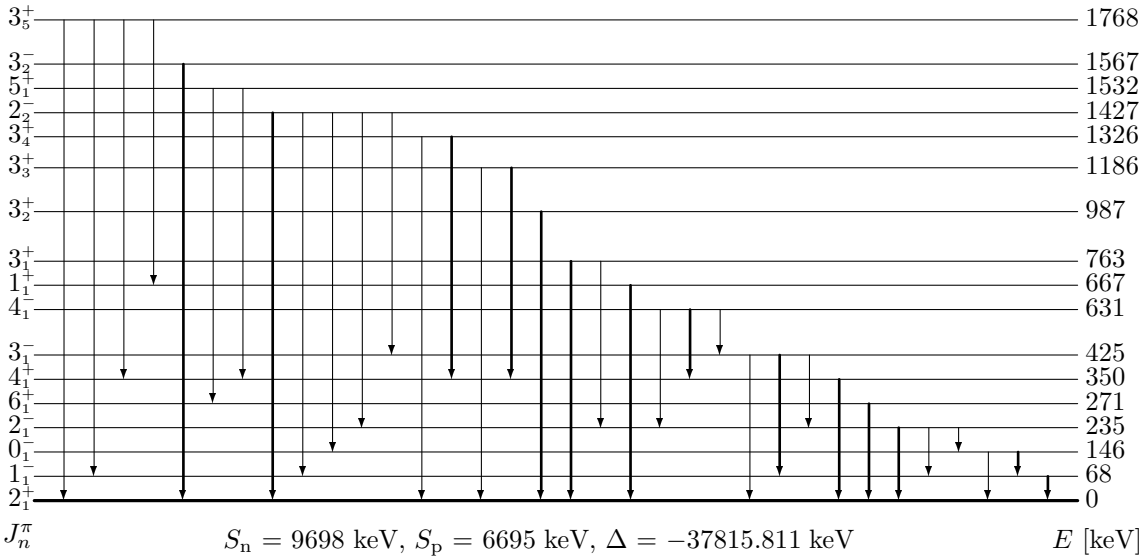
$$B(\mathrm{M}\lambda)_\mathrm{W.u.} = \frac{10}{\pi}\left(\frac{3}{\lambda+3}\right)^2 (1.2 \cdot A^{1/3})^{2\lambda-2} \quad \mu_n^2\ \mathrm{fm}^{2\lambda-2}\ .$$

$B(\mathrm{M1/E2} \to J_n^\pi)$ means that the decay to the J_n^π level occurs by M1 and E2 transitions. For such cases the mixing ratio, δ, is given in brackets if known;

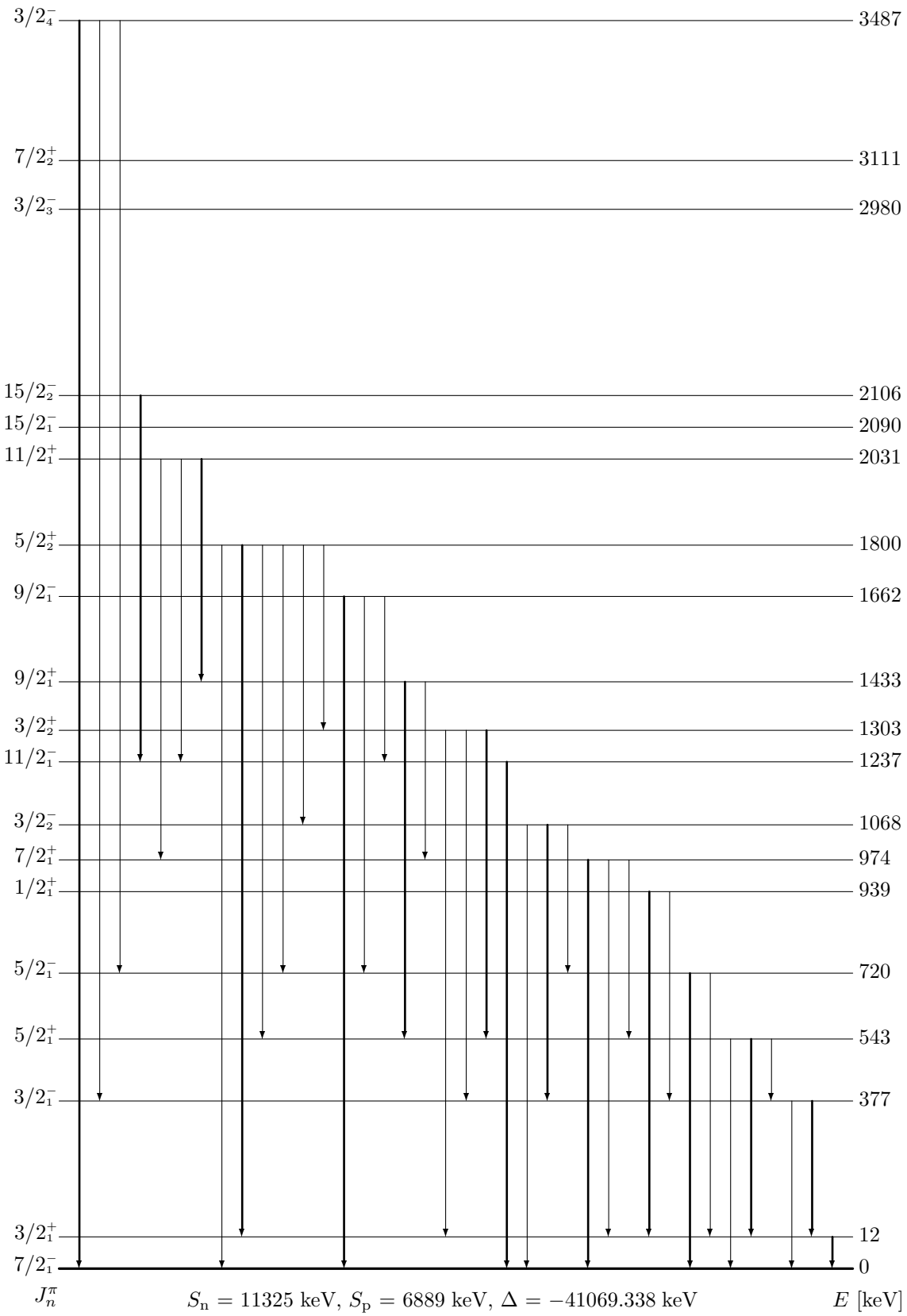
4) main nuclear reactions in which the level have been populated. These are: a) Coulomb excitation (Coul. ex.); b) inelastic scattering of γ's, electrons, protons, deuterons and α-particles; c) one-nucleon transfer reactions; d) two-nucleon transfer reactions. If the $\log ft$ value is given for the level, it means that it is also populated in β^+ or β^- decays, respectively, or in both.


7/2₈⁻ 4371
7/2₇⁻ 4235
7/2₆⁻ 4038
7/2₅⁻ 3807
7/2₄⁻ 3503
5/2₄⁻ 3463
7/2₃⁻ 3293
15/2₁⁻ 2987
3/2₅⁻ 2670
1/2₂⁺ 2651
5/2₃⁻ 2288
3/2₄⁻ 2094
5/2₂⁻ 1963
9/2₁⁺ 1931
11/2₁⁻ 1830
3/2₃⁻ 1811
5/2₂⁺ 1651
7/2₂⁻ 1408
7/2₁⁺ 1337
3/2₂⁻ 1179
3/2₂⁺ 1158
5/2₁⁺ 880
1/2₁⁺ 855
5/2₁⁻ 845
3/2₁⁻ 472
3/2₁⁺ 152
7/2₁⁻ 0
J_n^π
S_n = 12136 keV, S_p = 4930 keV, Δ = −36187.623 keV
E [keV]

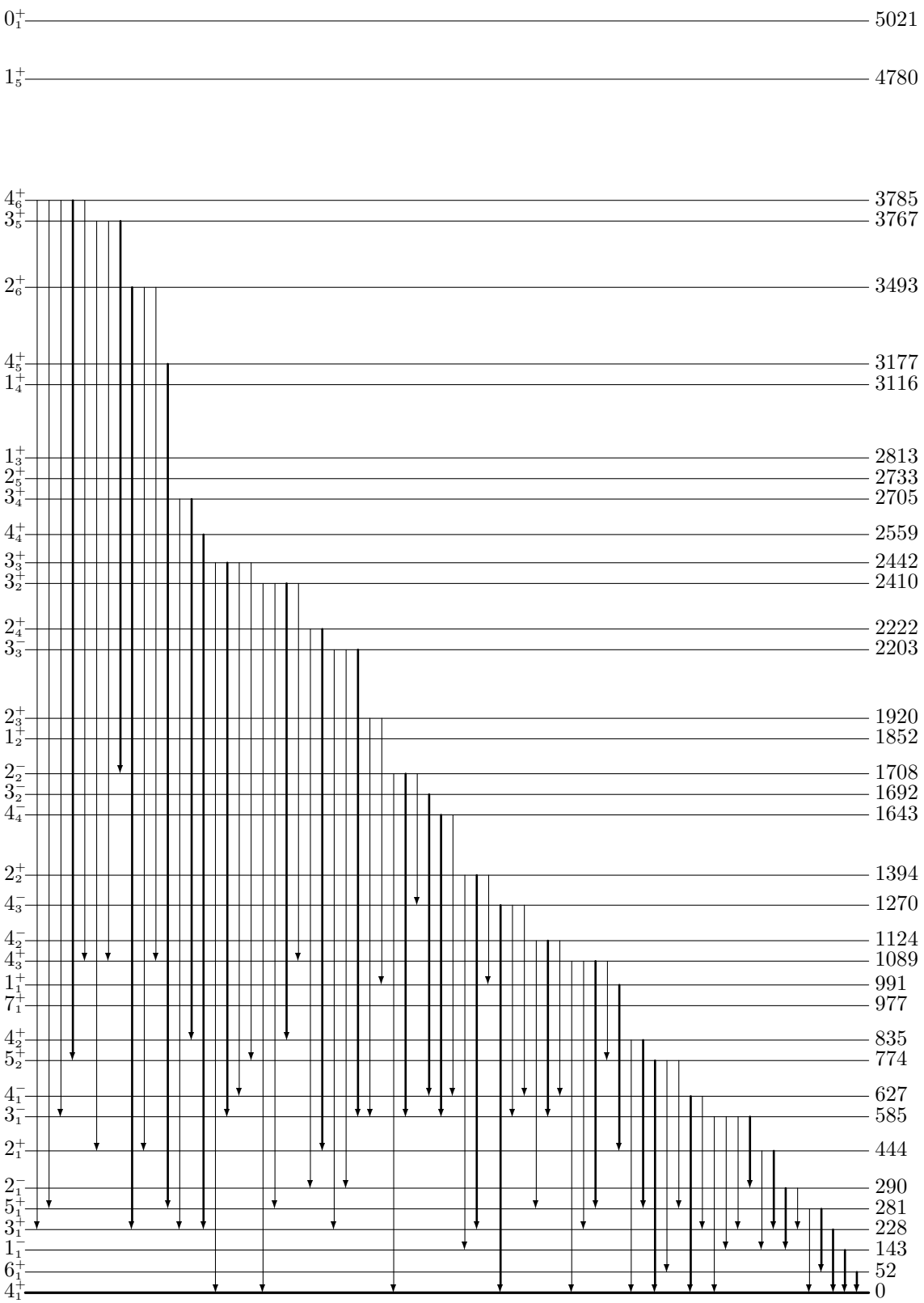
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [90E, 98B]
$7/2_1^-$	0	3.891 h	log ft = 3.56 (β^+ from $7/2^-$), Q = −0.26 barn, μ = 4.62 μ_n, (d,n), (^{3}He,d), (p,t)
$3/2_1^+$	152	438 μs	B(M2→ $7/2_1^-$) = 0.071 W.u., μ = 0.348 μ_n, (d,n), (^{3}He,d)
$3/2_1^-$	472	157 ps	B(E1→ $3/2_1^+$) = 4.3 · 10^{-6} W.u., B(E2→ $7/2_1^-$) = 16.5 W.u., (d,n), (^{3}He,d), (p,t)
$5/2_1^-$	845	180 fs	B(M1→ $7/2_1^-$) = 0.20 W.u., log ft = 4.77 (β^+ from $7/2^-$), (p,t)
$1/2_1^+$	855	22 ps	B(E1→ $3/2_1^-$) = 8.9 · 10^{-5} W.u., (d,n), (^{3}He,d)
$5/2_1^+$	880	4.4 ps	B(M1/E2→ $3/2_1^+$) = 0.0101/14 W.u. (δ = −0.51)
$3/2_2^+$	1158	4.4 ps	B(M1→ $5/2_1^+$) = 0.047 W.u., B(M1→ $1/2_1^+$) = 0.043 W.u., B(M1/E2→ $3/2_1^+$) = 0.0010/4.7 W.u. (δ = −1.3)
$3/2_2^-$	1179	485 fs	B(M1→ $5/2_1^-$) = 0.15 W.u., B(M1→ $3/2_1^-$) = 0.09 W.u., B(E2→ $7/2_1^-$) = 9 W.u., (d,n), (^{3}He,d), (p,t)
$7/2_1^+$	1337	0.8 ps	B(M1→ $5/2_1^+$) = 0.050 W.u., B(E2→ $3/2_1^+$) = 21 W.u., B(E1→ $7/2_1^-$) = 5.4 · 10^{-5} W.u.
$7/2_2^-$	1408	195 fs	B(M1→ $5/2_1^-$) = 0.08 W.u., B(E2→ $3/2_1^-$) = 22 W.u., B(M1→ $7/2_1^-$) = 0.032 W.u., log ft = 5.12 (β^+ from $7/2^-$), (p,t)
$5/2_2^+$	1651	175 fs	B(M1→ $3/2_2^+$) = 0.21 W.u., B(E2→ $1/2_1^+$) = 34 W.u., B(M1→ $3/2_1^+$) = 0.021 W.u., B(E1→ $7/2_1^-$) = 9.8 · 10^{-5} W.u.
$3/2_3^-$	1811	15 fs	B(M1→ $3/2_2^-$) = 2.2 W.u., B(E1→ $1/2_1^+$) = 0.007 W.u., B(M1→ $3/2_1^-$) = 0.20 W.u., B(E1→ $3/2_1^+$) = 0.0008 W.u., (d,n), (^{3}He,d), (p,t)
$11/2_1^-$	1830	200 fs	B(E2→ $7/2_1^-$) = 15.4 W.u., (p,t)
$9/2_1^+$	1931	2.4 ps	B(M1→ $7/2_1^+$) = 0.009 W.u., B(E2→ $5/2_1^+$) = 16 W.u., (p,t)
$5/2_2^-$	1963	70 fs	B(M1→ $3/2_2^-$) = 0.085 W.u., B(E1→ $3/2_2^+$) = 0.00046 W.u., B(M1→ $3/2_1^-$) = 0.076 W.u., log ft = 6.31 (β^+ from $7/2^-$), (d,n), (^{3}He,d)
$3/2_4^-$	2094	305 fs	B(M1→ $3/2_2^-$) = 0.031 W.u., B(E1→ $5/2_1^+$) = 0.00010 W.u., B(E1→ $1/2_1^+$) = 0.00017 W.u., B(E1→ $3/2_1^+$) = 4.2 · 10^{-5} W.u., (d,n), (^{3}He,d)
$5/2_3^-$	2288	<20 fs	log ft = 3.84 (β^+ from $7/2^-$), (^{3}He,t), (d,n), (^{3}He,d), (p,t)
$1/2_2^+$	2651		(d,n)
$3/2_5^-$	2670		(^{3}He,d), (p,t)
$15/2_1^-$	2987	5.6 ps	B(E2→ $11/2_1^-$) = 5.4 W.u., (^{3}He,t), (^{3}He,d), (p,t)
$7/2_3^-$	3293	>55 fs	(p,t)
$5/2_4^-$	3463		(^{3}He,t), (^{3}He,d), (p,t)
$7/2_4^-$	3503		(^{3}He,d), (p,t)
$7/2_5^-$	3807		(p,t)
$7/2_6^-$	4038		(p,t)
$7/2_7^-$	4235		(^{3}He,t), (d,n), (^{3}He,d), (p,t)
$7/2_8^-$	4371		(^{3}He,t), (d,n), (^{3}He,d)
$3/2_6^-$	6143	125 eV	(d,n), (^{3}He,d)
$1/2_3^+$	6222	50 eV	
$1/2_1^-$	6685	125 eV	(^{3}He,d)
$1/2_2^-$	6696	70 eV	(^{3}He,d)
$1/2_3^-$	6710	1.3 keV	(^{3}He,d)



J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [90E, 98B]
2^+_1	0	3.927 h	Q = 0.10 barn, μ = 2.56 μ_n, (d,t), (^{3}He,d), (d,α)
1^-_1	68	155.6 ns	B(E1→ 2^+_1) = 1.12 · 10^{-5} W.u., log ft = 9.10 (β^+ from 0^+), Q = 0.21 barn, μ = 0.344 μ_n, (d,α)
0^-_1	146	51.1 μs	B(M1→ 1^-_1) = 8.7 · 10^{-7} W.u., B(M2→ 2^+_1) = 0.00066 W.u., log ft = 6.50 (β^+ from 0^+), (d,α)
2^-_1	235	6.1 ns	B(M1→ 1^-_1) = 0.000241 W.u., B(E1→ 2^+_1) = 4.7 · 10^{-6} W.u., μ = 0.68 μ_n, (d,α)
6^+_1	271	58.6 h	B(E4→ 2^+_1) = 1.42 W.u., Q = −0.19 barn, μ = 3.88 μ_n, (d,t), (^{3}He,d)
4^+_1	350	3.1 ns	B(E2→ 2^+_1) = 3.78 W.u., μ = 3.6 μ_n, (d,t), (^{3}He,d), (d,α)
3^-_1	425	380 ps	B(M1→ 2^-_1) = 0.0022 W.u., B(E2→ 1^-_1) = 16.1 W.u., B(E1→ 2^+_1) = 3.0 · 10^{-6} W.u., (d,t), (^{3}He,d), (d,α)
4^-_1	631	400 ps	B(E1→ 4^+_1) = 2.92 · 10^{-5} W.u., B(E2→ 2^-_1) = 6.8 W.u., (d,t), (^{3}He,d), (d,α)
1^+_1	667	51 fs	B(M1→ 2^+_1) = 1.5 W.u., (d,t), (^{3}He,d), (d,α)
3^+_1	763	225 fs	B(E1→ 2^-_1) = 0.0011 W.u., B(M1→ 2^+_1) = 0.20 W.u., (d,t), (^{3}He,d), (d,α)
3^+_2	987	14 ps	(^{3}He,d), (d,α)
3^+_3	1186	38 fs	B(M1→ 4^+_1) = 0.59 W.u., B(M1→ 2^+_1) = 0.14 W.u., (d,t), (^{3}He,d), (d,α)
3^+_4	1326	125 fs	B(M1→ 4^+_1) = 0.106 W.u., B(M1→ 2^+_1) = 0.033 W.u., (d,α)
2^-_2	1427	40 fs	(d,t), (^{3}He,d), (d,α)
5^+_1	1532		(d,t), (^{3}He,d), (d,α)
3^-_2	1567		(d,t), (d,α)
3^+_5	1768	55 fs	(^{3}He,d), (d,α)
4^-_2	2031		(^{3}He,t), (d,t), (^{3}He,d), (d,α)
4^-_3	2213		(^{3}He,t), (d,t), (d,α)
2^+_2	2241		(^{3}He,t), (d,t), (^{3}He,d), (d,α)
4^-_4	2490		(^{3}He,t), (d,t), (d,α)
0^+_1	2783		(^{3}He,t), (d,t), (^{3}He,d)


3/2$_4^-$ 3487
7/2$_2^+$ 3111
3/2$_3^-$ 2980
15/2$_2^-$ 2106
15/2$_1^-$ 2090
11/2$_1^+$ 2031
5/2$_2^+$ 1800
9/2$_1^-$ 1662
9/2$_1^+$ 1433
3/2$_2^+$ 1303
11/2$_1^-$ 1237
3/2$_2^-$ 1068
7/2$_1^+$ 974
1/2$_1^+$ 939
5/2$_1^-$ 720
5/2$_1^+$ 543
3/2$_1^-$ 377
3/2$_1^+$ 12
7/2$_1^-$ 0
J_n^π
S_n = 11325 keV, S_p = 6889 keV, Δ = −41069.338 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92B1, 98B]
$7/2_1^-$	0	stable	log $ft = 5.98$ (β^- from $7/2^-$), log $ft = 4.59$ (β^+ from $7/2^-$), $Q = -0.22$ barn, $\mu = 4.7564866\ \mu_n$
$3/2_1^+$	12	318 ms	log $ft = 10.30$ (β^- from $7/2^-$), log $ft = 9.30$ (β^+ from $7/2^-$), (γ,γ'), Coul. ex., (p,p′), (d,d′), (^{3}He,d), (d,^{3}He)
$3/2_1^-$	377	43.3 ps	B(E2→ $7/2_1^-$) = 14.9 W.u., Coul. ex., (p,p′), (d,d′), (^{3}He,d), (d,^{3}He), (^{3}He,p), (d,α)
$5/2_1^+$	543	5.5 ps	B(M1/E2→ $3/2_1^+$) = 0.0120/35 W.u. ($\delta = -0.55$), B(E1→ $3/2_1^-$) = $9.\cdot10^{-5}$ W.u., B(E1→ $7/2_1^-$) = 0.00025 W.u., log $ft = 8.50$ (β^+ from $7/2^-$), (γ,γ'), Coul. ex., (p,p′), (d,d′), (d,^{3}He), (d,α)
$5/2_1^-$	720	206 fs	B(M1/E2→ $7/2_1^-$) = 0.271/28 W.u. ($\delta = 0.14$), B(E1→ $3/2_1^+$) = 0.00025 W.u., log $ft = 6.24$ (β^+ from $7/2^-$), (γ,γ'), Coul. ex., (p,p′), (d,d′), (^{3}He,d), (d,^{3}He), (^{3}He,p), (d,α)
$1/2_1^+$	939	7.3 ps	B(E1→ $3/2_1^-$) = $7.1\cdot10^{-5}$ W.u., (p,p′), (d,d′), (^{3}He,d), (d,^{3}He), (d,α)
$7/2_1^+$	974	2.54 ps	B(M1/E2→ $5/2_1^+$) = 0.0105/62 W.u. ($\delta = -0.24$), B(E2→ $3/2_1^+$) = 8.9 W.u., B(E1→ $7/2_1^-$) = 0.000133 W.u., log $ft = 7.20$ (β^+ from $7/2^-$), (γ,γ'), Coul. ex., (p,p′)
$3/2_2^-$	1068	0.28 ps	B(M1/E2→ $5/2_1^-$) = 0.43/ < 120 W.u. ($\delta = 0.04$), B(M1/E2→ $3/2_1^-$) = 0.17/12 W.u. ($\delta = -0.11$), B(E2→ $7/2_1^-$) = 4.7 W.u., Coul. ex., (p,p′), (d,d′), (^{3}He,d), (d,^{3}He), (^{3}He,p), (d,α)
$11/2_1^-$	1237	1.80 ps	B(E2→ $7/2_1^-$) = 11.4 W.u., (γ,γ'), Coul. ex., (p,p′), (d,d′), (d,^{3}He), (^{3}He,p), (d,α)
$3/2_2^+$	1303	2.3 ps	B(E1→ $3/2_1^-$) = $6.0\cdot10^{-5}$ W.u., B(E2→ $3/2_1^+$) = 2.5 W.u., (p,p′), (d,d′), (d,^{3}He), (d,α)
$9/2_1^+$	1433	3.6 ps	B(E1→ $11/2_1^-$) = 0.0005 W.u., B(E2→ $5/2_1^+$) = 20 W.u., B(M1/E2→ $7/2_1^+$) = 0.011/8 W.u. ($\delta = -0.24$), B(E1/M2→ $7/2_1^-$) = $6.\cdot10^{-6}$/2 W.u. ($\delta = -0.11$), (p,p′), (d,d′), (^{3}He,d)
$9/2_1^-$	1662	98 fs	B(M1/E2→ $11/2_1^-$) = 0.38/ < 60 W.u. ($\delta = -0.03$), B(M1/E2→ $7/2_1^-$) = 0.027/5.9 W.u. ($\delta = -0.47$), B(E2→ $5/2_1^-$) = $8.\cdot10^1$ W.u., log $ft = 5.60$ (β^+ from $7/2^-$), (γ,γ'), Coul. ex., (p,p′), (d,d′), (^{3}He,p)
$5/2_2^+$	1800	65 fs	B(M1→ $3/2_2^+$) = 0.34 W.u., B(E1→ $3/2_2^-$) = 0.00066 W.u., B(E1→ $5/2_1^-$) = 0.00021 W.u., B(E1→ $3/2_1^-$) = 0.00026 W.u., B(E1→ $7/2_1^-$) = 0.00012 W.u., log $ft = 8.00$ (β^+ from $7/2^-$), (γ,γ'), (p,p′), (d,d′), (d,^{3}He), (d,α)
$11/2_1^+$	2031	0.71 ps	B(M1/E2→ $9/2_1^+$) = 0.067/18 W.u. ($\delta = -0.19$), B(E1→ $11/2_1^-$) = $9.\cdot10^{-5}$ W.u., B(E2→ $7/2_1^+$) = 30 W.u., (p,p′), (d,d′), (d,α)
$15/2_1^-$	2090		
$15/2_2^-$	2106	>1.4 ps	B(E2→ $11/2_1^-$) < 86 W.u., (d,d′)
$3/2_3^-$	2980		(p,p′), (d,d′), (^{3}He,d), (^{3}He,p)
$7/2_2^+$	3111		(p,p′), (d,d′), (^{3}He,d)
$3/2_4^-$	3487		(p,p′), (d,d′), (^{3}He,d)
$7/2_2^-$	6699		(^{3}He,p)
$3/2_5^-$	8112	37 eV	B(E1→ $1/2_1^+$) = 0.000211 W.u., B(E1/M2→ $3/2_1^+$) = 0.0003216/0.02 W.u. ($\delta = -0.03$), (p,p′)
$3/2_6^-$	8128	23 eV	B(E1→ $3/2_1^+$) = $7.63\cdot10^{-5}$ W.u., (p,p′)
$5/2_3^+$	8472		(p,p′)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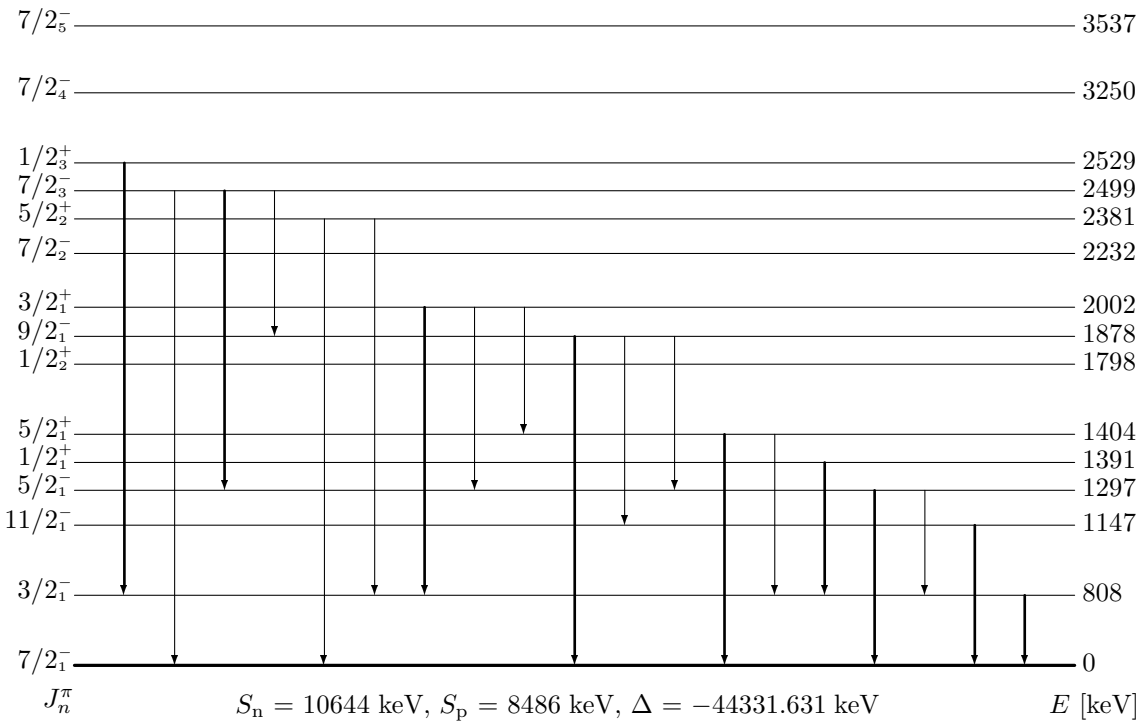
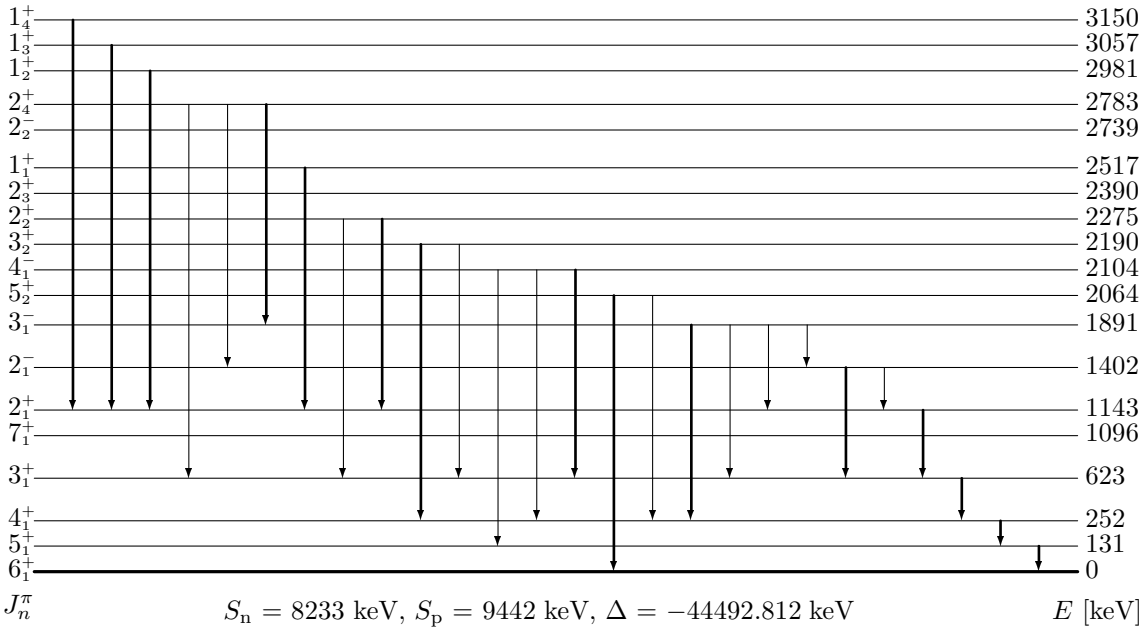
1_5^+ 4780
4_6^+ 3785
3_5^+ 3767
2_6^+ 3493
4_5^+ 3177
1_4^+ 3116
1_3^+ 2813
2_5^+ 2733
3_4^+ 2705
4_4^+ 2559
3_3^+ 2442
3_2^+ 2410
2_4^+ 2222
3_3^- 2203
2_3^+ 1920
1_2^+ 1852
2_2^- 1708
3_2^- 1692
4_4^- 1643
2_2^+ 1394
4_3^- 1270
4_2^- 1124
4_3^+ 1089
1_1^+ 991
7_1^+ 977
4_2^+ 835
5_2^+ 774
4_1^- 627
3_1^- 585
2_1^+ 444
2_1^- 290
5_1^+ 281
3_1^+ 228
1_1^- 143
6_1^+ 52
4_1^+ 0
J_n^π
S_n = 8761 keV, S_p = 8235 keV, Δ = −41758.637 keV
E [keV]

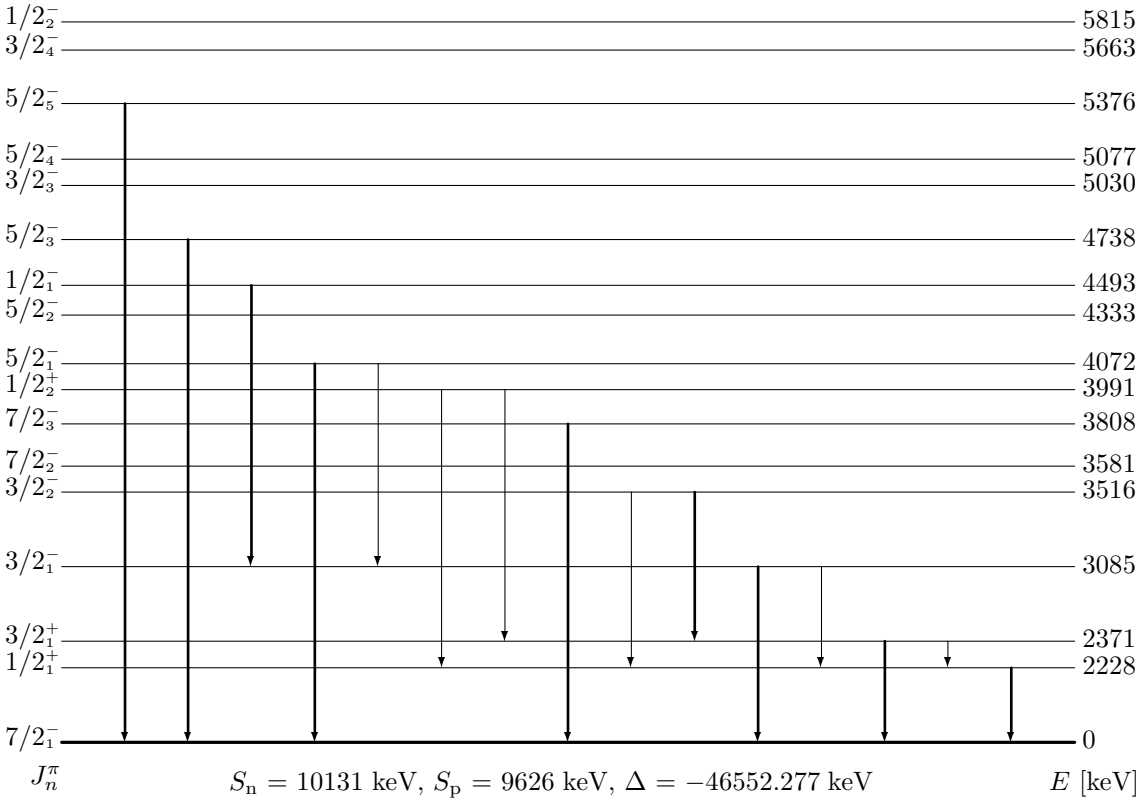
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93P, 98B]
4_1^+	0	83.79 d	$Q = 0.119$ barn, $\mu = 3.03\ \mu_n$
6_1^+	52	9.4 μs	
1_1^-	143	18.75 s	
3_1^+	228	270 ps	
5_1^+	281	270 ps	
2_1^-	290	380 ps	
2_1^+	444	270 ps	
3_1^-	585	4 ps	
4_1^-	627	200 ps	
5_2^+	774		
4_2^+	835	200 ps	(d,p), (d,^{3}He), (t,d), (t,^{3}He), (^{3}He,t)
7_1^+	977		(d,p), (t,d), (t,^{3}He), (^{3}He,t), (d,α)
1_1^+	991		(d,^{3}He), (t,^{3}He), (^{3}He,t), (p,^{3}He), (^{3}He,p), (d,α)
4_3^+	1089		(d,p), (t,d), (t,^{3}He), (^{3}He,t), (p,^{3}He)
4_2^-	1124	1.1 ps	(d,p), (d,^{3}He), (t,^{3}He), (p,^{3}He), (d,α)
4_3^-	1270		(d,p), (d,^{3}He), (t,^{3}He), (p,^{3}He), (d,α)
2_2^+	1394		(d,p), (t,^{3}He), (^{3}He,t), (p,^{3}He), (^{3}He,p), (d,α)
4_4^-	1643		(d,p), (t,^{3}He), (p,^{3}He), (^{3}He,p), (d,α)
3_2^-	1692		(d,p)
2_2^-	1708		(d,^{3}He), (t,^{3}He), (p,^{3}He), (d,α)
1_2^+	1852		(d,p), (t,^{3}He), (^{3}He,t), (p,^{3}He), (^{3}He,p), (d,α)
2_3^+	1920		(d,p), (t,^{3}He), (p,^{3}He), (d,α)
3_3^-	2203		(d,p), (p,^{3}He), (d,α)
2_4^+	2222		(d,p), (t,^{3}He), (^{3}He,t), (p,^{3}He), (d,α)
3_2^+	2410		(d,p), (t,^{3}He), (^{3}He,t), (p,^{3}He), (^{3}He,p), (d,α)
3_3^+	2442		(t,^{3}He), (p,^{3}He), (d,α)
4_4^+	2559		(t,^{3}He), (^{3}He,t), (p,^{3}He), (d,α)
3_4^+	2705		(^{3}He,t), (p,^{3}He), (d,α)
2_5^+	2733		(t,^{3}He)
1_3^+	2813		(t,^{3}He), (p,^{3}He), (d,α)
1_4^+	3116		(t,^{3}He), (p,^{3}He)
4_5^+	3177		(d,p), (t,^{3}He)
2_6^+	3493		(t,^{3}He), (p,^{3}He)
3_5^+	3767		(d,p), (t,^{3}He)
4_6^+	3785		(d,p), (t,^{3}He)
1_5^+	4780		(^{3}He,p)
0_1^+	5021		(d,p), (p,^{3}He), (^{3}He,p)



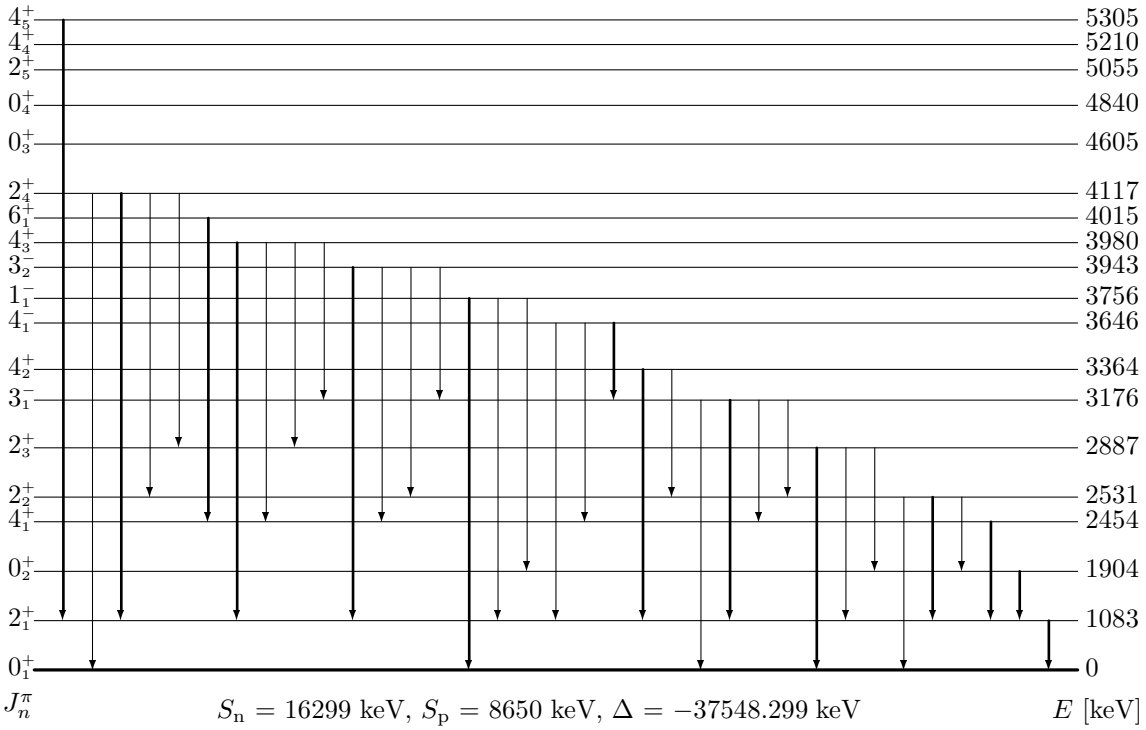
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95B1, 98B]
$7/2_1^-$	0	3.3492 d	log ft = 8.50 (β^- from $7/2^-$), Q = −0.22 barn, μ = 5.34 μ_n
$3/2_1^-$	808	15 ps	B(E2→ $7/2_1^-$) = 11 W.u., (d,^{3}He), (^{3}He,d), (t,α), (d,α), (t,p)
$11/2_1^-$	1147	3.2 ps	B(E2→ $7/2_1^-$) = 9 W.u., (d,α), (t,p)
$5/2_1^-$	1297	62 fs	B(M1/E2→ $3/2_1^-$) = 0.23/1.1 · 10^2 W.u. (δ = −0.21), B(M1/E2→ $7/2_1^-$) = 0.15/0.09 W.u. (δ = −0.020), log ft = 6.04 (β^- from $7/2^-$), (t,α), (d,α), (t,p)
$1/2_1^+$	1391	9 ps	B(E1→ $3/2_1^-$) = 0.00025 W.u., (d,^{3}He), (^{3}He,d), (t,α)
$5/2_1^+$	1404	0.97 ps	B(E1→ $3/2_1^-$) = 0.00021 W.u., B(E1/M2→ $7/2_1^-$) = 0.00014/0.5 W.u. (δ = −0.04)
$1/2_2^+$	1798		(t,α), (d,α), (t,p)
$9/2_1^-$	1878	0.12 ps	B(M1/E2→ $11/2_1^-$) = 0.14/13 W.u. (δ = −0.14), B(M1/E2→ $7/2_1^-$) = 0.019/0.3 W.u. (δ = −0.14), log ft = 6.69 (β^- from $7/2^-$), (t,p)
$3/2_1^+$	2002	0.40 ps	B(E1→ $5/2_1^-$) = 0.0007 W.u., B(E1→ $3/2_1^-$) = 0.00044 W.u., (d,^{3}He), (t,α)
$7/2_2^-$	2232		(t,p)
$5/2_2^+$	2381	<0.17 ps	B(E1→ $3/2_1^-$) > 0.00014 W.u., B(E1→ $7/2_1^-$) > 8.6 · 10^{-5} W.u., (d,^{3}He), (t,α)
$7/2_3^-$	2499	<0.15 ps	B(M1→ $5/2_1^-$) > 0.043 W.u., B(M1→ $7/2_1^-$) > 0.00090 W.u., (d,^{3}He), (^{3}He,d), (t,p)
$1/2_3^+$	2529	<0.21 ps	B(E1→ $3/2_1^-$) > 0.00033 W.u., (d,^{3}He), (t,α), (t,p)
$7/2_4^-$	3250		(^{3}He,d), (t,p)
$7/2_5^-$	3537		(t,p)



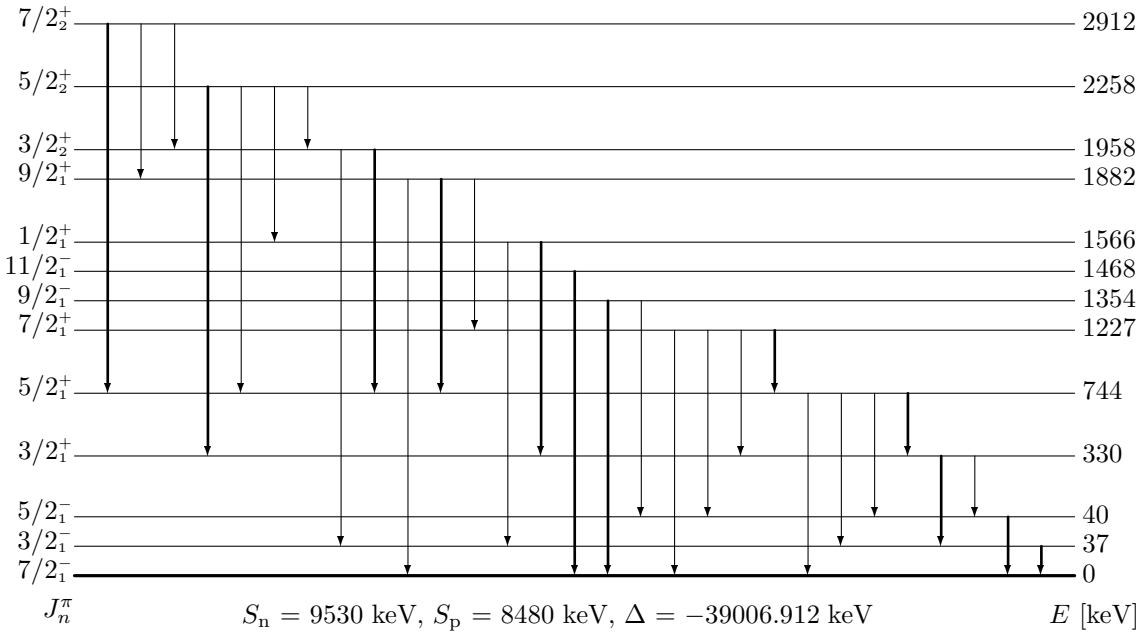
J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93B1, 98B]
6^+_1	0	43.67 h	(p,n), (d,^{3}He), (t,^{3}He), (^{3}He,t), (p,^{3}He), (^{3}He,p), (d,α), (α,d)
5^+_1	131		(p,n), (d,^{3}He), (t,^{3}He), (^{3}He,t), (^{3}He,p), (d,α), (α,d)
4^+_1	252		(p,n), (d,^{3}He), (t,^{3}He), (^{3}He,t), (^{3}He,p), (d,α), (α,d)
3^+_1	623		(p,n), (d,^{3}He), (t,^{3}He), (^{3}He,t), (^{3}He,p), (d,α), (α,d)
7^+_1	1096		(d,^{3}He), (t,^{3}He), (^{3}He,t), (^{3}He,p), (d,α), (α,d)
2^+_1	1143		(p,n), (d,^{3}He), (t,^{3}He), (^{3}He,t), (^{3}He,p), (d,α), (α,d)
2^-_1	1402		(p,n), (d,^{3}He), (t,^{3}He), (^{3}He,t), (d,α)
3^-_1	1891		(p,n), (d,^{3}He), (t,^{3}He), (d,α)
5^+_2	2064		(p,n), (t,^{3}He), (^{3}He,p)
4^-_1	2104		(p,n), (d,^{3}He), (t,^{3}He), (^{3}He,t), (d,α)
3^+_2	2190		(p,n), (t,^{3}He)
2^+_2	2275		(p,n), (t,^{3}He), (^{3}He,t), (^{3}He,p), (α,d)
2^+_3	2390		(d,^{3}He), (t,^{3}He), (d,α)
1^+_1	2517		(p,n), (t,^{3}He), (^{3}He,t), (^{3}He,p), (d,α), (α,d)
2^-_2	2739		(d,^{3}He), (t,^{3}He), (d,α)
2^+_4	2783		(p,n), (t,^{3}He)
1^+_2	2981		(p,n), (t,^{3}He), (^{3}He,t), (^{3}He,p), (d,α), (α,d)
1^+_3	3057		(p,n), (t,^{3}He), (^{3}He,t), (^{3}He,p), (d,α), (α,d)
1^+_4	3150		(t,^{3}He), (^{3}He,p)
1^+_5	3711		(p,n), (t,^{3}He), (^{3}He,p)
1^+_6	4175		(p,n), (^{3}He,p), (d,α)
1^+_7	4676		(^{3}He,t), (^{3}He,p)
1^+_8	4778		(^{3}He,p)
1^+_9	5454		(^{3}He,t), (^{3}He,p)
1^+_{10}	5742		(^{3}He,p)
0^+_1	6678		(^{3}He,t), (p,^{3}He), (^{3}He,p)



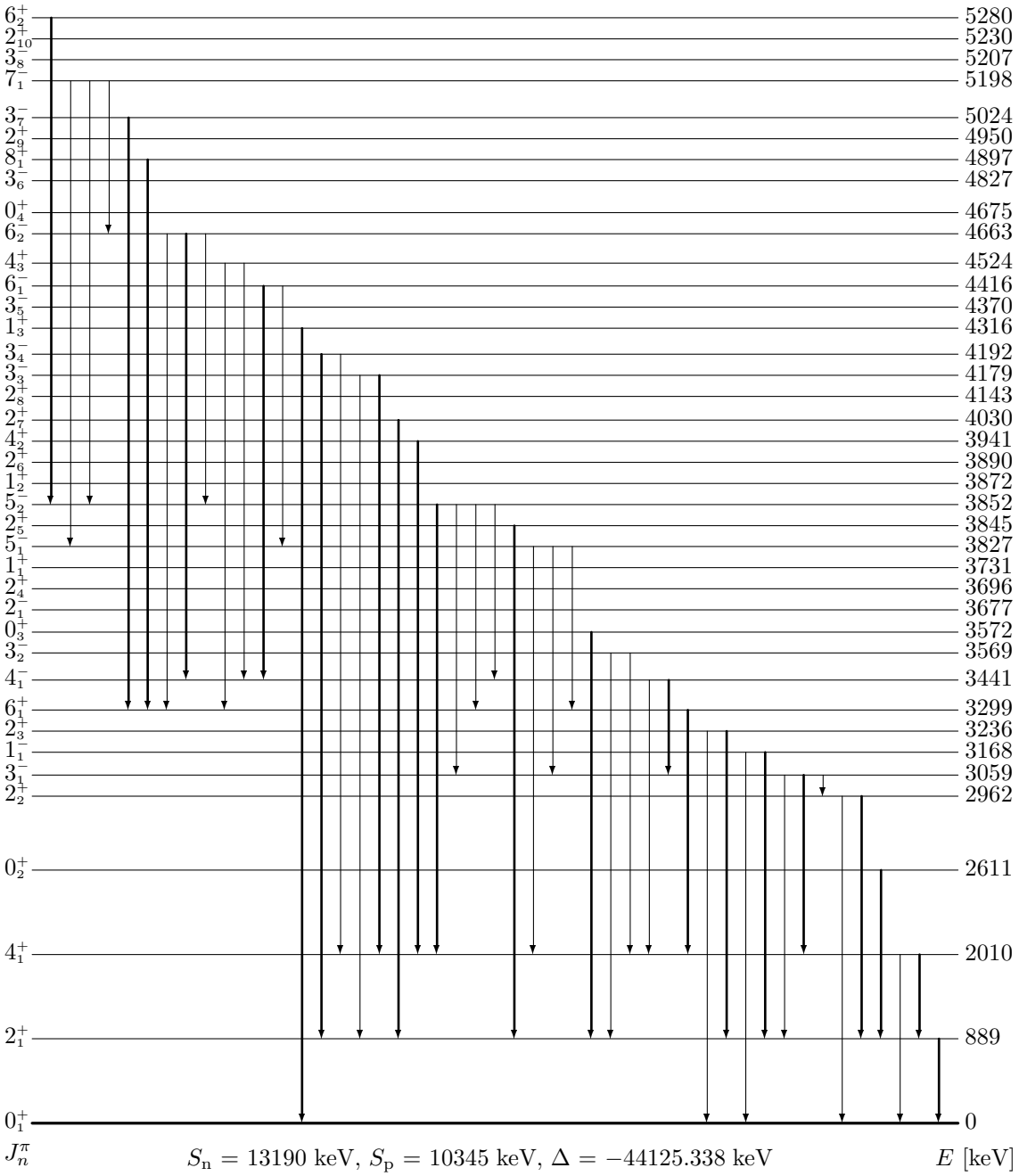
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95B3, 98B]
$7/2_1^-$	0	57.2 m	(d,n), (d,^{3}He)
$1/2_1^+$	2228	29.9 ns	B(E3→ $7/2_1^-$) = 1.04 W.u., log ft = 9.40 (β^- from $3/2^-$), (d,n), (d,^{3}He)
$3/2_1^+$	2371	1.40 ns	B(M2→ $7/2_1^-$) = 0.020 W.u., log ft = 8.00 (β^- from $3/2^-$), (d,n), (d,^{3}He)
$3/2_1^-$	3085	48 fs	B(E2→ $7/2_1^-$) = 4.0 W.u., log ft = 5.07 (β^- from $3/2^-$), (d,n)
$3/2_2^-$	3516		log ft = 7.40 (β^- from $3/2^-$), (d,n)
$7/2_2^-$	3581		(d,n)
$7/2_3^-$	3808	21 fs	(d,n)
$1/2_2^+$	3991	≥0.7 ns	(d,n), (d,^{3}He)
$5/2_1^-$	4072	28 fs	log ft = 5.12 (β^- from $3/2^-$), (d,n)
$5/2_2^-$	4333		(d,n)
$1/2_1^-$	4493	23 fs	log ft = 5.41 (β^- from $3/2^-$), (d,n), (d,^{3}He)
$5/2_3^-$	4738	≤14 fs	log ft = 5.30 (β^- from $3/2^-$), (d,n)
$3/2_3^-$	5030		
$5/2_4^-$	5077		(d,n)
$5/2_5^-$	5376	21 fs	(d,n)
$3/2_4^-$	5663		(d,n)
$1/2_2^-$	5815		(d,n)
$5/2_6^-$	6306		(d,n)
$7/2_4^-$	6415	21 fs	(d,n)



J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [90E, 98B]
0^+_1	0	63 y	(p,t)
2^+_1	1083	3.1 ps	B(E2→ 0^+_1) = 13 W.u., (p,t)
0^+_2	1904	>480 fs	(p,t)
4^+_1	2454	415 fs	B(E2→ 2^+_1) = 30 W.u., (p,t)
2^+_2	2531	0.97 ps	B(E2→ 0^+_2) = 24 W.u., B(E2→ 2^+_1) = 7.1 W.u., B(E2→ 0^+_1) = 0.15 W.u., (p,t)
2^+_3	2887	345 fs	B(E2→ 0^+_1) = 0.52 W.u., (p,t)
3^-_1	3176	>2 ps	(p,t)
4^+_2	3364	345 fs	B(E2→ 2^+_2) = 22 W.u., B(E2→ 2^+_1) = 2.7 W.u., (p,t)
4^-_1	3646	2.7 ps	
1^-_1	3756	165 fs	B(E1→ 2^+_1) = $4.8 \cdot 10^{-5}$ W.u., B(E1→ 0^+_1) = $4.5 \cdot 10^{-5}$ W.u.
3^-_2	3943	0.83 ps	B(E1→ 4^+_1) = $1.0 \cdot 10^{-5}$ W.u., B(E1→ 2^+_1) = $2.7 \cdot 10^{-5}$ W.u., (p,t)
4^+_3	3980	345 fs	B(E2→ 2^+_3) = 28 W.u., B(E2→ 2^+_1) = 0.45 W.u., (p,t)
6^+_1	4015	390 fs	B(E2→ 4^+_1) = 17.0 W.u., log ft = 4.00 (β^+ from (6^+)), (p,t)
2^+_4	4117	110 fs	B(E2→ 0^+_1) = 0.14 W.u.
0^+_3	4605		(p,t)
0^+_4	4840		
2^+_5	5055		(p,t)
4^+_4	5210		
4^+_5	5305	345 fs	(p,t)
2^+_6	6220		
2^+_7	6598		(p,t)
4^+_6	6959		(p,t)

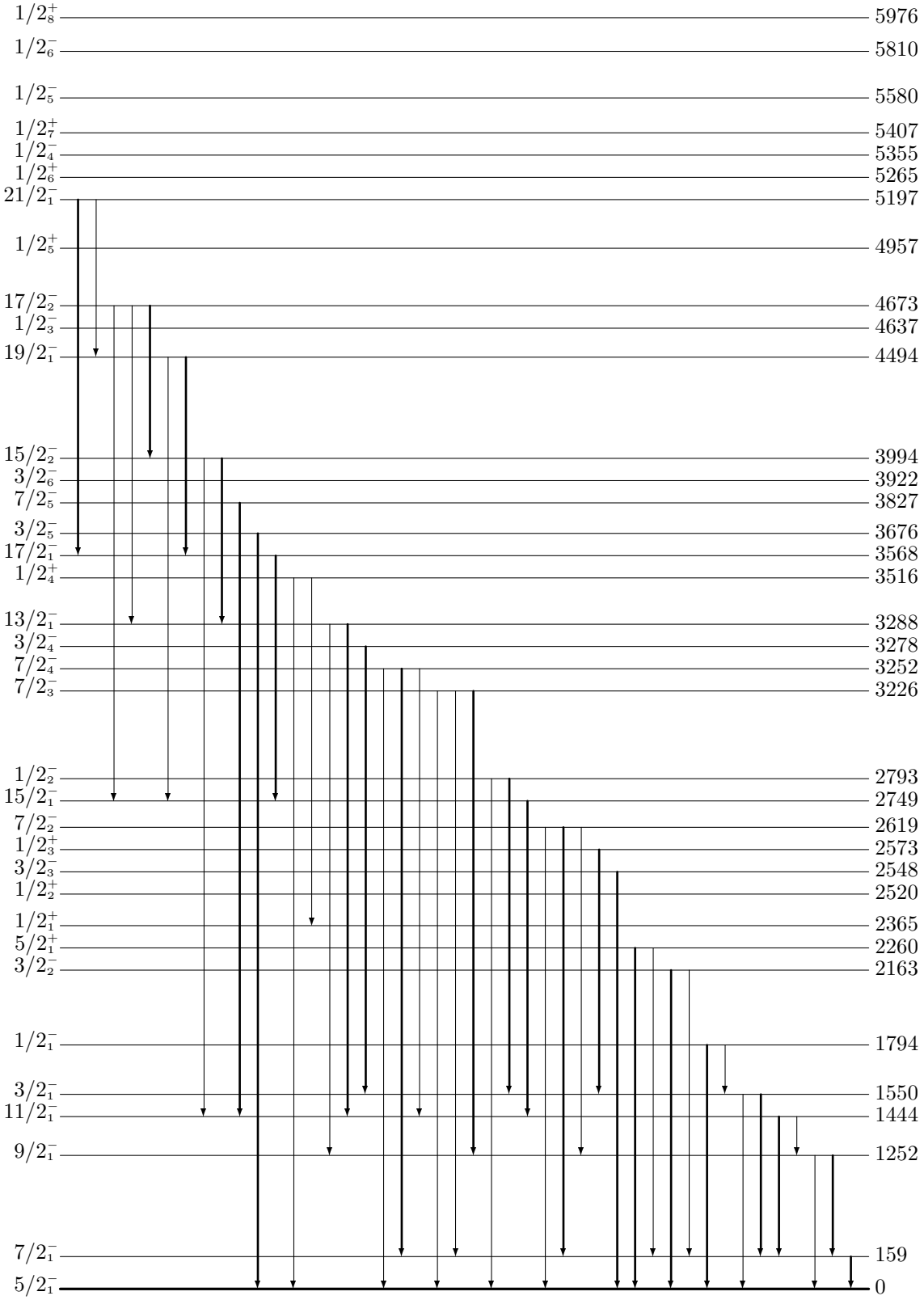


J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92B1, 98B]
$7/2_1^-$	0	184.8 m	log ft = 3.64 (β^+ from $7/2^-$), Q = 0.015 barn, μ = 0.095 μ_n, (p,n), (^{3}He,t), (p,d), (d,t),(^{3}He,α)
$3/2_1^-$	37	3.0 μs	B(E2→ $7/2_1^-$)$^{>14.0}_{<16.3}$ W.u., (p,n), (p,d), (d,t),(^{3}He,α)
$5/2_1^-$	40	11.29 ns	B(M1/E2→ $7/2_1^-$) = 0.00227/ < 2.37 W.u., log ft = 5.00 (β^+ from $7/2^-$), $\mu = -0.133$ μ_n, (p,n)
$3/2_1^+$	330	1.099 ns	B(E1/M2→ $5/2_1^-$) < $1.1 \cdot 10^{-7}$/ < 6 W.u., μ = 1.05 μ_n, B(E1→ $3/2_1^-$) = $9.64 \cdot 10^{-6}$ W.u., (p,n), (p,d), (d,t),(^{3}He,α)
$5/2_1^+$	744	10.5 ps	B(M1/E2→ $3/2_1^+$) = 0.023/58 W.u. (δ = 0.40), B(E1→ $5/2_1^-$) = $3.7 \cdot 10^{-6}$ W.u., B(E1/M2→ $3/2_1^-$) = $1.01 \cdot 10^{-5}$/0.3 W.u. (δ = 0.06), B(E1/M2→ $7/2_1^-$) < $2.4 \cdot 10^{-7}$/ < 2.0 W.u., (p,n)
$7/2_1^+$	1227	2.8 ps	B(E2→ $3/2_1^+$) = 14 W.u., B(M2→ $3/2_1^-$) < 0.13 W.u., B(M1/E2→ $5/2_1^+$) = 0.028/26 W.u. (δ = 0.28), B(E1/M2→ $7/2_1^-$) = $6. \cdot 10^{-6}$/2.3 W.u. ($\delta = -0.34$), (p,n)
$9/2_1^-$	1354	0.103 ps	B(M1/E2→ $7/2_1^-$) = 0.069/16 W.u. ($\delta = -0.39$), B(E2→ $5/2_1^-$) = 10.7 W.u., (p,n), (p,d), (d,t),(^{3}He,α)
$11/2_1^-$	1468	0.48 ps	B(E2→ $7/2_1^-$) = 9.0 W.u., (p,n), (p,d), (d,t),(^{3}He,α)
$1/2_1^+$	1566	>2.8 ps	B(M1/E2→ $3/2_1^+$) < 0.0036/ < 6.4 W.u., B(E1→ $3/2_1^-$) < $7.0 \cdot 10^{-6}$ W.u., (p,d), (d,t),(^{3}He,α)
$9/2_1^+$	1882	0.69 ps	B(M1/E2→ $7/2_1^+$) = 0.026/12 W.u. (δ = 0.27), (p,n), B(E1/M2→ $7/2_1^-$) < $5.6 \cdot 10^{-6}$/ < 7.2 W.u., B(E2→ $5/2_1^+$) = 16 W.u.
$3/2_2^+$	1958	0.83 ps	B(E1/M2→ $3/2_1^-$) < $1.4 \cdot 10^{-5}$/ < 18 W.u., (p,n), (p,d), (d,t),(^{3}He,α)
$5/2_2^+$	2258	0.194 ps	B(M1/E2→ $5/2_1^+$) = 0.0045/10 W.u. (δ = 1.4), B(M1/E2→ $3/2_2^+$) < 0.12/ < $3.8 \cdot 10^3$ W.u., B(M1/E2→ $3/2_1^+$) = 0.0073/0.9 W.u. (δ = 0.42), B(E2→ $1/2_1^+$) = $4. \cdot 10^1$ W.u., (p,n), (p,d), (d,t),(^{3}He,α)
$7/2_2^+$	2912	0.36 ps	B(E2→ $3/2_2^+$) = 48 W.u.

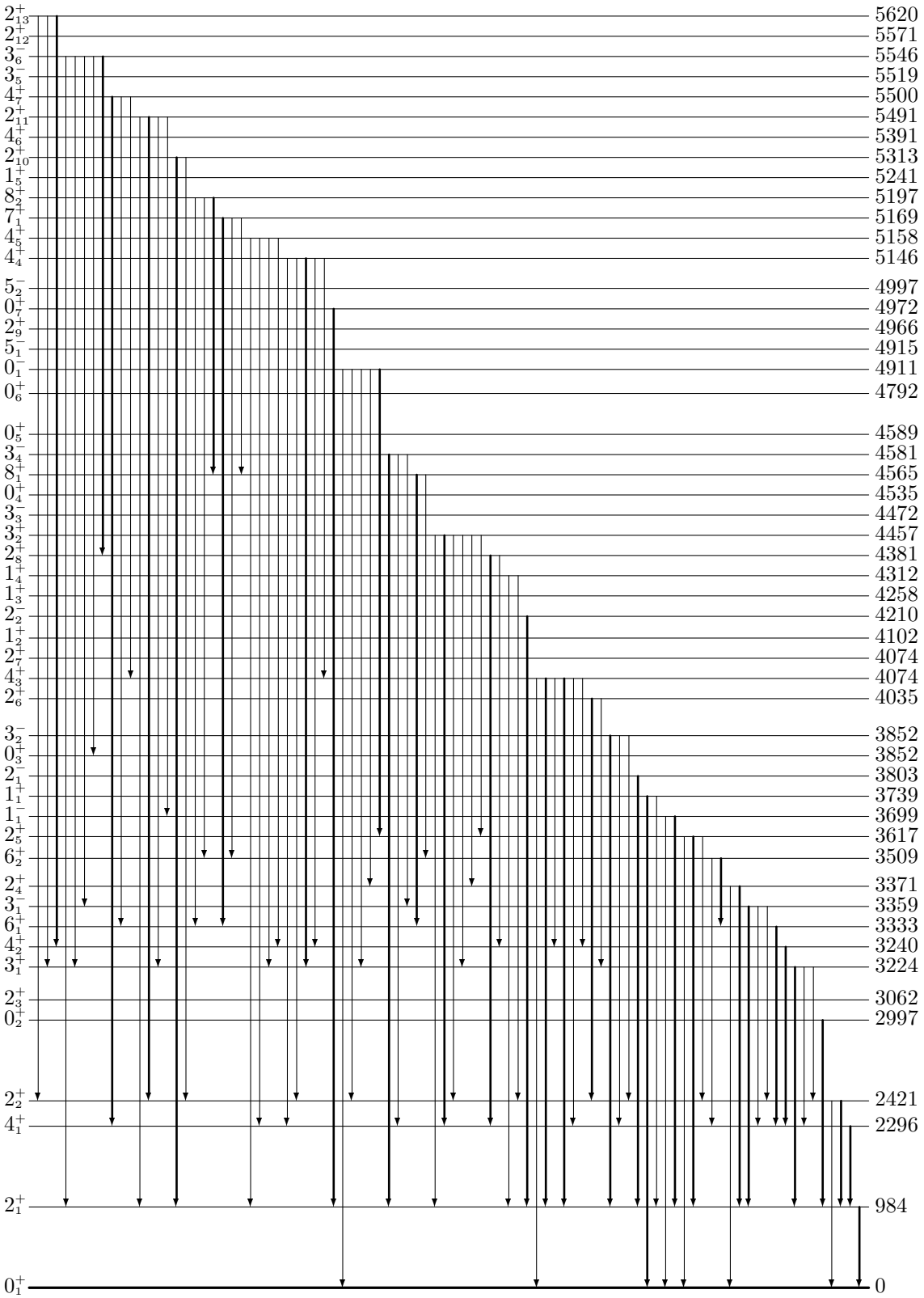


J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93P, 98B]
0_1^+	0	stable	log ft = 3.48 (β^+ from 0), (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (p,d), (d,t), (^{3}He,d), (^{3}He,n), (p,t)
2_1^+	889	5.1 ps	B(E2→ 0_1^+) = 20.4 W.u., log ft = 12.94 (β^- from 4), Q = −0.21 barn, μ = 0.98 μ_n, (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (p,d), (d,t), (^{3}He,d), (^{3}He,n), (p,t)

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93P, 98B]
4_1^+	2010	1.64 ps	B(E2$\rightarrow 2_1^+$) = 20.0 W.u., B(E4$\rightarrow 0_1^+$) = 4. · 10^2 W.u., log ft = 6.20 (β^- from 4), (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (p,d), (d,t), (^{3}He,d), (p,t)
0_2^+	2611	76 fs	B(E2$\rightarrow 2_1^+$) = 50 W.u., (p,p′), (d,d′), (p,t)
2_2^+	2962	166 fs	B(M1/E2$\rightarrow 2_1^+$) = 0.0058/5.2 W.u. ($\delta = -1.21$), B(E2$\rightarrow 0_1^+$) = 0.064 W.u., (e,e′), (p,p′), (d,d′), (p,γ), (^{3}He,d)
3_1^-	3059	7 ps	B(E1/M2$\rightarrow 4_1^+$) = 5.7 · 10^{-5}/2.9 W.u. ($\delta = 0.11$), B(E1$\rightarrow 2_2^+$) = 0.008 W.u., (p,p′), (d,d′), (p,γ), (^{3}He,d), (p,t)
1_1^-	3168	176 fs	B(E1$\rightarrow 2_1^+$) = 0.000138 W.u., B(E1$\rightarrow 0_1^+$) = 4.3 · 10^{-5} W.u., (γ,γ'), (p,p′), (p,γ)
2_3^+	3236	29 fs	B(M1/E2$\rightarrow 2_1^+$) = 0.025/11.8 W.u., B(E2$\rightarrow 0_1^+$) = 0.89 W.u., (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (p,d), (^{3}He,d), (p,t)
6_1^+	3299	0.99 ps	B(E2$\rightarrow 4_1^+$) = 16.4 W.u., (p,p′), (p,γ), (d,t), (^{3}He,d), (p,t)
4_1^-	3441	66 ps	(p,p′), (p,γ), (^{3}He,d)
3_2^-	3569	50 fs	(p,p′), (d,d′), (α,α'), (p,γ), (p,d), (^{3}He,d)
0_3^+	3572	203 fs	B(E2$\rightarrow 2_1^+$) = 2.05 W.u., (d,d′), (p,γ), (^{3}He,d)
2_1^-	3677		(e,e′), (p,p′)
2_4^+	3696		(e,e′)
1_1^+	3731		(e,e′)
5_1^-	3827	3.7 ps	(α,α'), (p,γ)
2_5^+	3845	8.9 fs	(p,γ), (^{3}He,d), (p,t)
5_2^-	3852	4.8 ps	
1_2^+	3872		(e,e′)
2_6^+	3890	0.38 ps	(p,p′), (p,γ), (^{3}He,n)
4_2^+	3941	38 fs	(p,p′), (p,γ)
2_7^+	4030		(e,e′), (p,p′), (^{3}He,d)
2_8^+	4143		(p,p′), (α,α'), (p,γ), (^{3}He,d), (p,t)
3_3^-	4179		(p,t)
3_4^-	4192		(p,p′), (p,γ), (^{3}He,d)
1_3^+	4316	2.7 fs	(γ,γ'), (e,e′), (p,p′), (p,d)
3_5^-	4370		(p,p′)
6_1^-	4416	0.45 ps	(p,p′)
4_3^+	4524	0.07 ps	
6_2^-	4663	1.4 ps	
0_4^+	4675		(p,t)
3_6^-	4827		(p,p′), (p,γ)
8_1^+	4897	0.45 ps	B(E2$\rightarrow 6_1^+$) = 12.3 W.u., (p,p′)
2_9^+	4950		(^{3}He,d), (p,t)
3_7^-	5024		(p,p′), (α,α'), (p,γ), (^{3}He,d)
7_1^-	5198	0.83 ps	
3_8^-	5207		(p,p′), (p,t)
2_{10}^+	5230		(e,e′), (p,p′)
6_2^+	5280		(α,α')
2_{11}^+	5321		(e,e′), (^{3}He,d)
2_{12}^+	5363		(e,e′), (^{3}He,d)
3_9^-	5409		(p,p′)
2_{13}^+	5515		(p,p′)
3_{10}^-	5535		(p,γ), (^{3}He,d), (p,t)
0_5^+	5610		(^{3}He,d), (^{3}He,n)

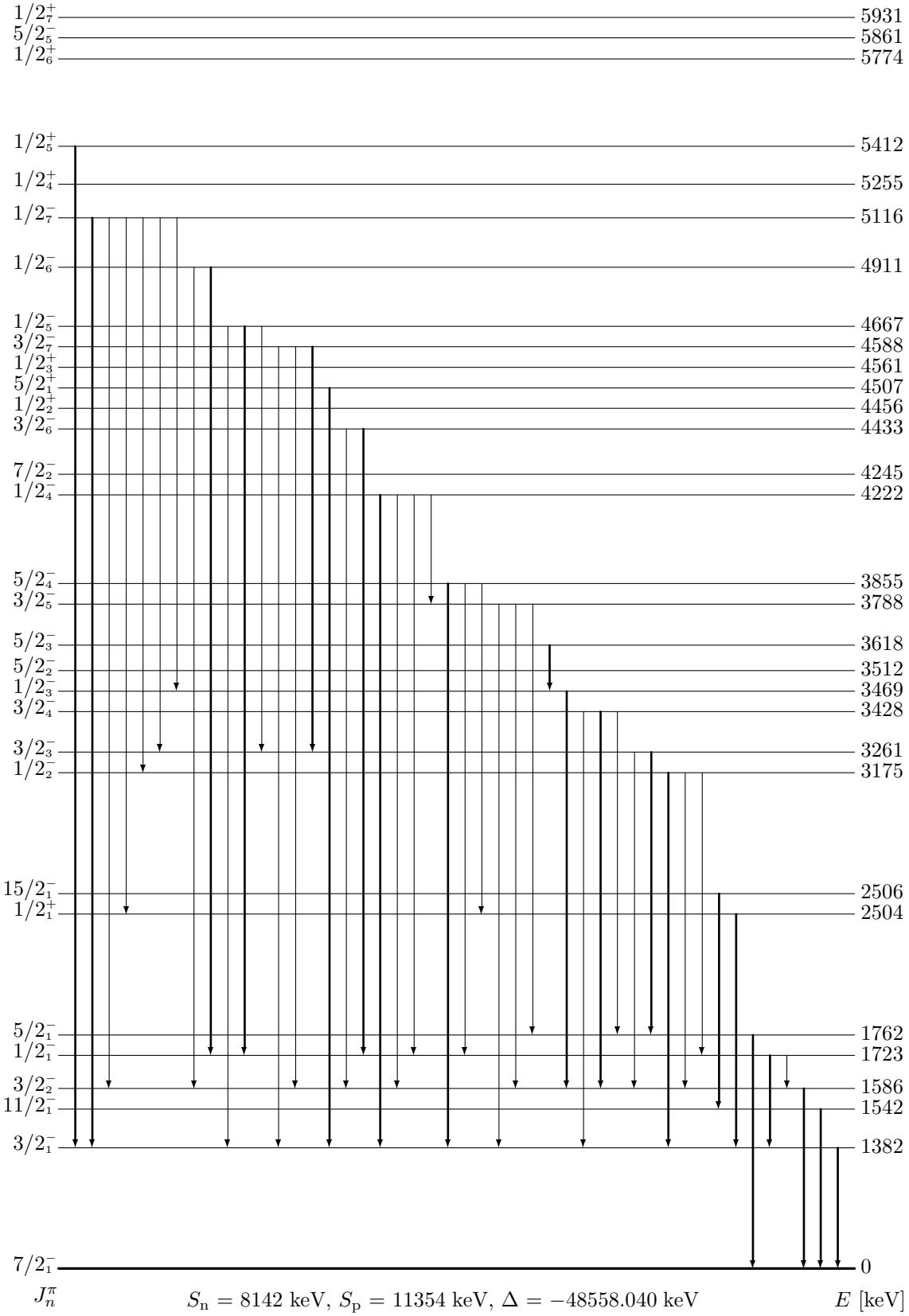

$1/2_8^+$ 5976
$1/2_6^-$ 5810
$1/2_5^-$ 5580
$1/2_7^+$ 5407
$1/2_4^-$ 5355
$1/2_6^+$ 5265
$21/2_1^-$ 5197
$1/2_5^+$ 4957
$17/2_2^-$ 4673
$1/2_3^-$ 4637
$19/2_1^-$ 4494
$15/2_2^-$ 3994
$3/2_6^-$ 3922
$7/2_5^-$ 3827
$3/2_5^-$ 3676
$17/2_1^-$ 3568
$1/2_4^+$ 3516
$13/2_1^-$ 3288
$3/2_4^-$ 3278
$7/2_4^-$ 3252
$7/2_3^-$ 3226
$1/2_2^-$ 2793
$15/2_1^-$ 2749
$7/2_2^-$ 2619
$1/2_3^+$ 2573
$3/2_3^-$ 2548
$1/2_2^+$ 2520
$1/2_1^+$ 2365
$5/2_1^+$ 2260
$3/2_2^-$ 2163
$1/2_1^-$ 1794
$3/2_1^-$ 1550
$11/2_1^-$ 1444
$9/2_1^-$ 1252
$7/2_1^-$ 159
$5/2_1^-$ 0
J_n^π
S_n = 8878 keV, S_p = 10462 keV, Δ = −44931.732 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95B1, 98B]
$5/2_1^-$	0	stable	log ft = 6.10 (β^- from $7/2^-$), log ft = 4.90 (β^+ from $3/2^-$), Q = 0.303 barn, $\mu = -0.78848\ \mu_n$
$7/2_1^-$	159	210 ps	B(M1/E2→ $5/2_1^-$) = 0.0255/25 W.u. ($\delta = -0.099$), log ft = 5.28 (β^- from $7/2^-$), $\mu = -1.9\ \mu_n$
$9/2_1^-$	1252	140 fs	B(M1/E2→ $7/2_1^-$) = 0.105/19 W.u. ($\delta = -0.29$), B(E2→ $5/2_1^-$) = 7 W.u., Coul. ex., (p,p′), (p,d), (d,t), (^{3}He,p)
$11/2_1^-$	1444	0.90 ps	B(M1/E2→ $9/2_1^-$) = 0.20/3. · 10^1 W.u. ($\delta = 0.05$), B(E2→ $7/2_1^-$) = 17 W.u.
$3/2_1^-$	1550	1.5 ps	B(M1/E2→ $5/2_1^-$) = 0.0015/0.33 W.u. ($\delta = 0.46$), B(E2→ $7/2_1^-$) = 3.9 W.u., log ft = 6.08 (β^+ from $3/2^-$)
$1/2_1^-$	1794	1.7 ps	B(M1/E2→ $3/2_1^-$) = 0.27/1.0 · 10^4 W.u. ($\delta = -0.30$), B(E2→ $5/2_1^-$) = 1.2 W.u., log ft = 5.10 (β^+ from $3/2^-$), (p,p′), (d,p), (d,t), (^{3}He,p)
$3/2_2^-$	2163	25 fs	B(E2→ $7/2_1^-$) = 3.6 W.u., B(M1→ $5/2_1^-$) = 0.083 W.u., (^{3}He,p), log ft = 5.36 (β^+ from $3/2^-$), (γ,γ'), (p,p′), (d,p), (p,d), (d,t)
$5/2_1^+$	2260	0.54 ps	B(E1→ $7/2_1^-$) = 1.9 · 10^{-5} W.u., B(E1→ $5/2_1^-$) = 6.8 · 10^{-5} W.u., (p,p′), (d,p), (p,d), (d,t)
$1/2_1^+$	2365	>1.53 ps	(p,p′), (d,p), (p,d), (d,t)
$1/2_2^+$	2520		(d,p), (d,t)
$3/2_3^-$	2548	6.2 fs	B(M1→ $5/2_1^-)^{>0.15}_{<0.24}$ W.u., log ft = 5.77 (β^+ from $3/2^-$), (γ,γ'), (p,p′), (d,p), (d,t)
$1/2_3^+$	2573	0.53 ps	B(E1→ $3/2_1^-$) = 6.7 · 10^{-4} W.u., (p,p′), (d,p), (p,d)
$7/2_2^-$	2619	29 fs	(p,p′), (d,p), (p,d), (d,t), (^{3}He,p)
$15/2_1^-$	2749	1.11 ps	B(E2→ $11/2_1^-$) = 13 W.u., (p,p′)
$1/2_2^-$	2793		log ft = 5.18 (β^+ from $3/2^-$), (p,p′), (d,p)
$7/2_3^-$	3226	7 fs	(p,p′), (d,p)
$7/2_4^-$	3252	29 fs	B(E2→ $11/2_1^-$) = 29 W.u., (p,p′), (d,p), (^{3}He,p)
$3/2_4^-$	3278	42 fs	(p,p′), (d,p)
$13/2_1^-$	3288	0.51 ps	B(M1→ $11/2_1^-$) = 0.044 W.u., B(E2→ $9/2_1^-$) = 0.22 W.u., (p,p′)
$1/2_4^+$	3516	40 fs	(p,p′), (d,p), (d,t)
$17/2_1^-$	3568	69 fs	B(M1/E2→ $15/2_1^-$) = 0.57/60 W.u. ($\delta = -0.16$), (p,p′)
$3/2_5^-$	3676	<40 fs	(p,p′), (d,p)
$7/2_5^-$	3827	17 fs	(p,p′), (d,p), (^{3}He,p)
$3/2_6^-$	3922		(γ,γ'), (d,p), (d,t), (^{3}He,p)
$15/2_2^-$	3994	0.10 ps	B(M1→ $13/2_1^-$) = 0.6 W.u., B(E2→ $11/2_1^-$) = 0.6 W.u.
$19/2_1^-$	4494	0.11 ps	B(M1/E2→ $17/2_1^-$) = 0.23/2 W.u. ($\delta = -0.05$), B(E2→ $15/2_1^-$) = 2.9 W.u., (p,p′)
$1/2_3^-$	4637		(d,p)
$17/2_2^-$	4673	0.12 ps	B(M1→ $15/2_2^-$) = 0.39 W.u., B(E2→ $13/2_1^-$) = 20 W.u.
$1/2_5^+$	4957		(d,p)
$21/2_1^-$	5197	0.12 ps	B(M1→ $19/2_1^-$) = 0.24 W.u., B(E2→ $17/2_1^-$) = 22 W.u.
$1/2_6^+$	5265		(d,p)
$1/2_4^-$	5355		(d,p)
$1/2_7^+$	5407		(d,p)
$1/2_5^-$	5580		(d,p)
$1/2_6^-$	5810		(d,p)
$1/2_8^+$	5976		(d,p)
$23/2_1^-$	6089	35 fs	B(M1/E2→ $21/2_1^-$) = 0.8/2. · 10^1 W.u. ($\delta = -0.09$), B(E2→ $19/2_1^-$) = 19 W.u.


2^+_{13} 5620
2^+_{12} 5571
3^-_6 5546
3^-_5 5519
4^+_7 5500
2^+_{11} 5491
4^+_6 5391
2^+_{10} 5313
1^+_5 5241
8^+_2 5197
7^+_1 5169
4^+_5 5158
4^+_4 5146
5^-_2 4997
0^+_7 4972
2^+_9 4966
5^-_1 4915
0^-_1 4911
0^+_6 4792
0^+_5 4589
3^-_4 4581
8^+_1 4565
0^+_4 4535
3^-_3 4472
3^+_2 4457
2^+_8 4381
1^+_4 4312
1^+_3 4258
2^-_2 4210
1^+_2 4102
2^+_7 4074
4^+_3 4074
2^+_6 4035
3^-_2 3852
0^+_3 3852
2^-_1 3803
1^+_1 3739
1^-_1 3699
2^+_5 3617
6^+_2 3509
2^+_4 3371
3^-_1 3359
6^+_1 3333
4^+_2 3240
3^+_1 3224
2^+_3 3062
0^+_2 2997
2^+_2 2421
4^+_1 2296
2^+_1 984
0^+_1 0
J^π_n
S_n = 11627 keV, S_p = 11444 keV, Δ = −48487.000 keV
E [keV]

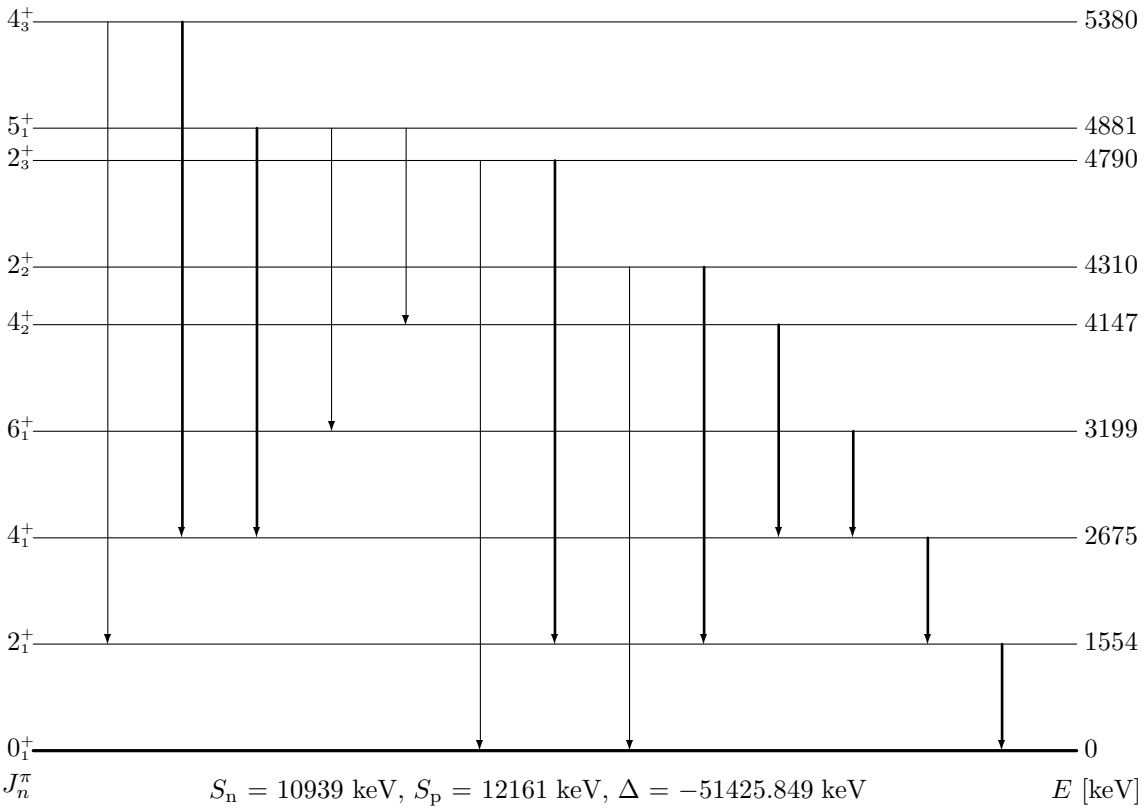
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93B1, 98B]
0_1^+	0	stable	
2_1^+	984	4.27 ps	B(E2→ 0_1^+) = 13.9 W.u., log ft = 9.90 (β^+ from 4), Q = −0.177 barn, μ = 0.86 μ_n, (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (p,d), (d,t), (d,p), (p,t), (t,p)
4_1^+	2296	1.27 ps	B(E2→ 2_1^+) = 11.2 W.u., log ft = 6.17 (β^+ from 4), (γ,γ'), (p,p′), (d,d′), (α,α'), (p,d), (d,t), (d,p), (p,t)
2_2^+	2421	40.7 fs	B(M1/E2→ 2_1^+) = 0.167/6.5 W.u. (δ = 0.18), B(E2→ 0_1^+) = 0.83 W.u., log ft = 10.00 (β^+ from 4), (γ,γ'), (e,e′), (p,p′), (d,d′), (α,α'), (p,d), (d,t), (d,p), (p,t)
0_2^+	2997	77 fs	B(E2→ 2_1^+) = 19 W.u., (e,e′), (p,p′), (d,d′), (α,α'), (p,d), (d,t), (p,t), (t,p)
2_3^+	3062		(e,e′), (p,p′)
3_1^+	3224	30 fs	B(M1/E2→ 2_1^+) = 0.037/1.2 W.u. (δ = 0.26), log ft = 6.56 (β^+ from 4), (e,e′), (p,d), (d,t), (d,p)
4_2^+	3240	46 fs	B(M1→ 4_1^+) = 0.59 W.u., log ft = 6.18 (β^+ from 4), (p,p′), (d,d′), (α,α'), (p,d), (d,t), (p,t)
6_1^+	3333		B(E2→ 4_1^+)$^{5.1}_{<2.1}\cdot 10^2$ W.u., log ft = 5.53 (β^- from 6), (α,α'), (p,d), (d,t), (d,p), (p,t)
3_1^-	3359	183 fs	B(E1→ 2_1^+) = 0.000189 W.u., log ft = 8.70 (β^+ from 4), (e,e′), (p,p′), (d,d′), (α,α'), (p,d), (d,t)
2_4^+	3371	11.3 fs	B(M1/E2→ 2_1^+)$^{>0.100}_{<0.125}$/ < 11 W.u. (δ = 0.5), (γ,γ'), (e,e′), (d,d′), (α,α'), (p,d), (d,t), (d,p), (p,t)
6_2^+	3509		B(M1→ 6_1^+)$^{1.29}_{<2.21}$ W.u., B(E2→ 4_1^+)$^{2.10}_{<3.59}$ W.u., log ft = 6.01 (β^- from 6), (p,p′), (α,α'), (p,d), (d,t), (d,p), (p,t)
2_5^+	3617	42 fs	(e,e′), (p,p′), (α,α'), (p,d), (d,t), (d,p), (p,t), (t,p)
1_1^-	3699		B(E1→ 2_1^+)$^{>0.00068}_{<0.00284}$ W.u., B(E1→ 0_1^+)$^{>0.000146}_{<0.00061}$ W.u., (γ,γ'), (e,e′), (p,p′), (d,p)
1_1^+	3739	2.91 fs	B(M1/E2→ 2_1^+) = 0.08/4 W.u. (δ = −0.4), B(M1→ 0_1^+) = 0.098 W.u., (γ,γ'), (e,e′), (p,d), (d,t), (d,p), (p,t)
2_1^-	3803		(e,e′), (p,p′)
0_3^+	3852		(p,t)
3_2^-	3852	49 fs	B(E1→ 2_1^+) = 0.00033 W.u., (e,e′), (p,p′), (α,α'), (p,d), (d,t), (d,p)
2_6^+	4035	42 fs	(α,α'), (p,d), (d,t), (d,p), (t,p)
4_3^+	4074	35 fs	(p,p′), (p,d), (d,t), (d,p), (p,t)
2_7^+	4074		(p,p′), (α,α'), (p,d), (d,t), (d,p)
1_2^+	4102		(e,e′)
2_2^-	4210		(e,e′), (d,p)
1_3^+	4258		(e,e′), (t,p)
1_4^+	4312	2.2 fs	B(M1→ 0_1^+) = 0.073 W.u., (γ,γ'), (p,p′), (d,p)
2_8^+	4381	24 fs	(α,α'), (p,d), (d,t), (t,p)
3_2^+	4457	49 fs	B(M1/E2→ 2_1^+) = 0.0024/$^{>0.0048}_{<0.008}$ W.u., (p,d), (d,t), (d,p)
3_3^-	4472		(p,p′)
0_4^+	4535		(p,p′), (p,t)
8_1^+	4565		B(E2→ 6_2^+)$^{>0.0042}_{<1.19}$ W.u., B(E2→ 6_1^+)$^{>0.017}_{<4.96}$ W.u.
3_4^-	4581	28 fs	B(E1→ 2_2^+) = 0.00016 W.u., (e,e′), (p,p′), (α,α'), (p,d), (d,t), (d,p), (p,t)
0_5^+	4589		(p,t), (t,p)
0_6^+	4792	28 fs	(p,p′), (α,α'), (p,d), (d,t), (d,p), (p,t), (t,p)
0_1^-	4911		(e,e′), (p,p′), (d,p)

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93B1, 98B]
5_1^-	4915	0.19 ps	(α,α'), (p,d), (d,t), (p,t)
2_9^+	4966		(p,p′), (α,α')
0_7^+	4972		(e,e′), (p,p′), (p,t), (t,p)
5_2^-	4997		(p,p′), (α,α'), (p,d), (d,t), (d,p), (p,t)
4_4^+	5146	49 fs	(α,α'), (p,d), (d,t), (d,p), (p,t)
4_5^+	5158	<25 fs	(p,p′), (p,d), (d,t), (p,t)
7_1^+	5169	28 fs	B(M1/E2→ 6_2^+) = 0.051/0.6 W.u. ($\delta = 0.11$), B(M1/E2→ 6_1^+) = 0.08/0.5 W.u. ($\delta = 0.09$), (p,d), (d,t)
8_2^+	5197	76 fs	B(M1/E2→ 8_1^+) = 0.9/ < 100 W.u. ($\delta = -0.03$), B(E2→ 6_2^+) = 7 W.u., (p,d), (d,t)
1_5^+	5241		(e,e′)
2_{10}^+	5313		(e,e′), (p,p′), (α,α'), (p,d), (d,t), (d,p)
4_6^+	5391		(p,p′), (d,p)
2_{11}^+	5491		(d,p), (p,t), (t,p)
4_7^+	5500	26 fs	(p,t)
3_5^-	5519		(p,p′), (α,α'), (p,d), (d,t), (p,t)
3_6^-	5546		(p,p′), (d,p), (p,t)
2_{12}^+	5571		(e,e′), (p,t)
2_{13}^+	5620		(e,e′), (p,p′), (α,α'), (d,p)
1_6^+	5640	0.53 fs	(γ,γ'), (e,e′), (d,p)
3_7^-	5642	24 fs	(p,d), (d,t)
1_7^+	5657		(e,e′)
2_{14}^+	5764		(e,e′), (p,p′), (d,p)
3_8^-	5826		(e,e′), (α,α'), (p,d), (d,t)
3_9^-	5846	<21 fs	(e,e′), (p,p′), (α,α')
2_{15}^+	5885		(e,e′), (α,α')
2_{16}^+	5916		(e,e′), (p,p′), (α,α')
0_2^-	6055		(e,e′), (p,p′), (α,α'), (p,d), (d,t), (d,p), (p,t)
2_{17}^+	6115		(α,α'), (d,p)
0_8^+	6122		(e,e′)
2_{18}^+	6236		(γ,γ')
3_{10}^-	6246		(e,e′), (p,d), (d,t)
3_{11}^-	6337		(α,α')
3_{12}^-	6461		(α,α')
4_8^+	6514		(p,p′), (α,α')
0_3^-	6542		(p,p′)
1_2^-	6604	0.86 eV	B(E1→ 2_1^+) = 0.001349 W.u., B(E1→ 0_1^+) = 0.002520 W.u., (γ,γ'), (p,p′)
0_4^-	6626		(e,e′), (p,d), (d,t), (d,p)
4_9^+	6744		(d,p)
6_3^+	6880	125 fs	
0_5^-	6976		
1_3^-	6979		(γ,γ')
0_6^-	7061		(α,α')
1_8^+	7071		(γ,γ')
1_4^-	7124		(γ,γ')
1_9^+	7222		(γ,γ'), (e,e′), (d,p)
4_{10}^+	7274		

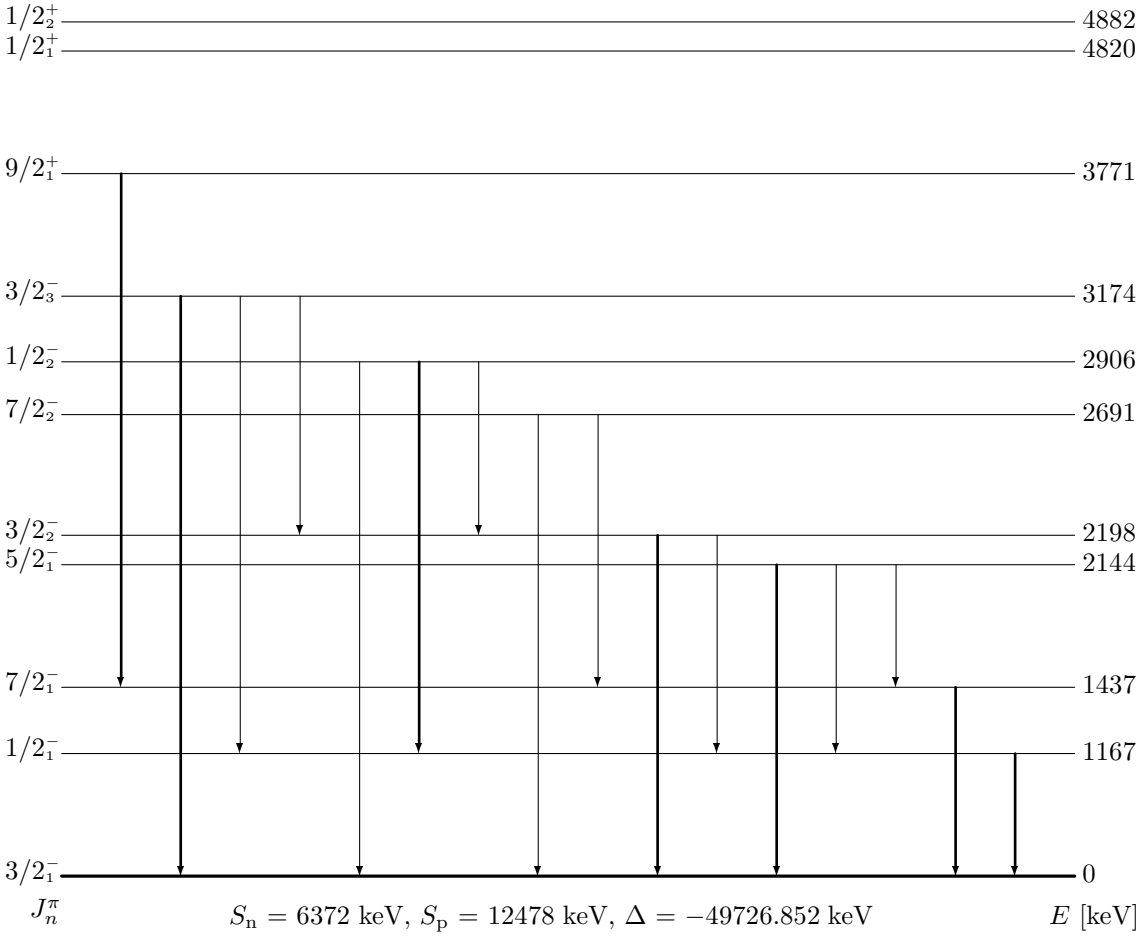


J_n^π $S_\mathrm{n} = 8142$ keV, $S_\mathrm{p} = 11354$ keV, $\Delta = -48558.040$ keV E [keV]

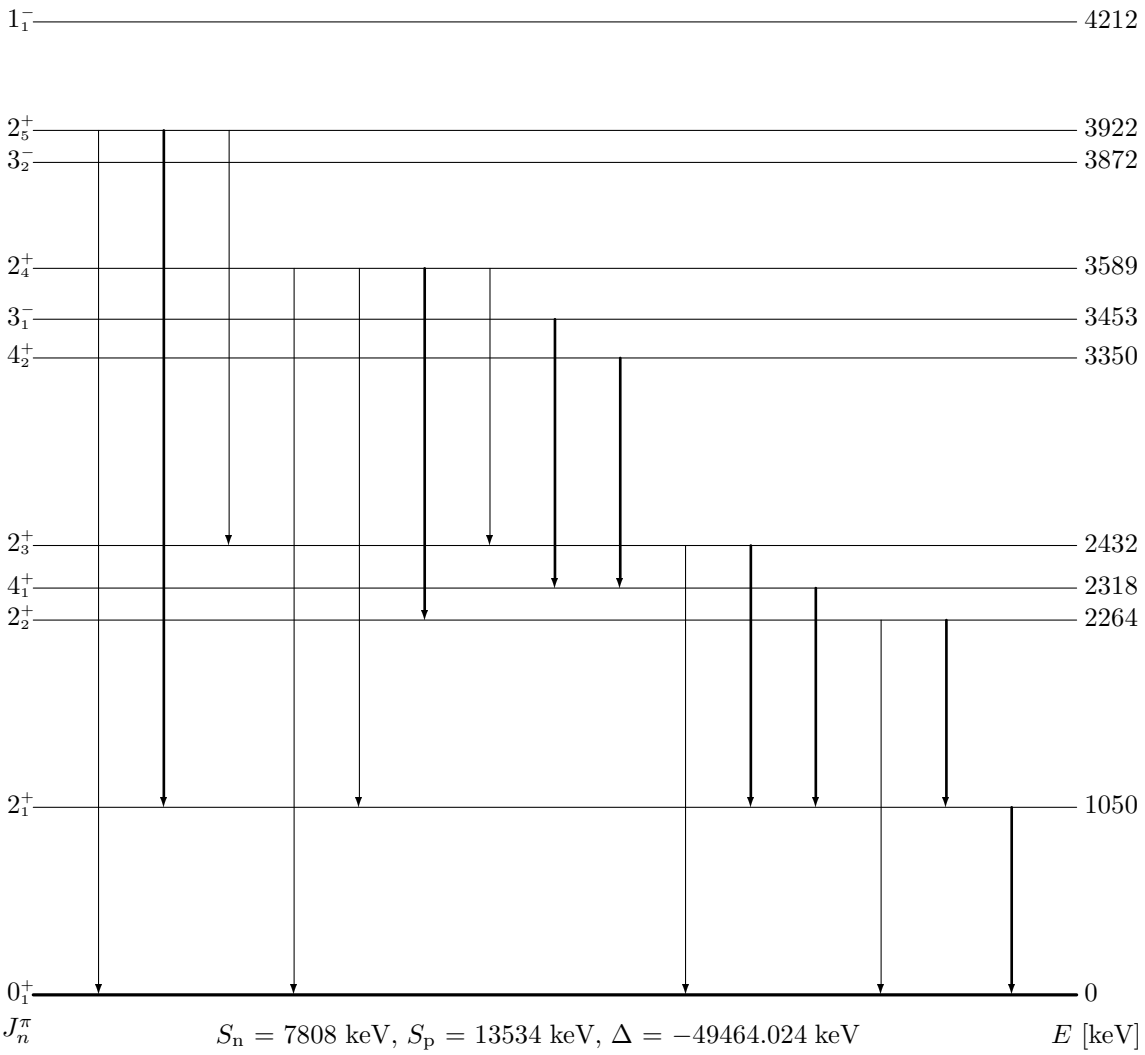
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95B3, 98B]
$7/2_1^-$	0	stable	log $ft = 5.71$ (β^- from $7/2^-$), log $ft = 6.20$ (β^+ from $7/2^-$), $Q = 0.24$ barn, $\mu = -1.10417\ \mu_n$
$3/2_1^-$	1382	3.4 ps	B(E2$\rightarrow 7/2_1^-$) = 3.1 W.u.
$11/2_1^-$	1542	1.00 ps	B(E2$\rightarrow 7/2_1^-$) = 6.1 W.u., (γ,γ'), Coul. ex., (p,p′), (d,p)
$3/2_2^-$	1586		B(E2$\rightarrow 7/2_1^-)^{>0.697}_{<0.963}$ W.u., (γ,γ'), Coul. ex., (p,p′), (d,p), (p,d), (d,t), (t,p)
$1/2_1^-$	1723		B(M1/E2$\rightarrow 3/2_1^-)^{<1.52>}_{7.74\cdot10^{-5}}/^{<316}_{>0.0160}$ W.u. ($\delta = 0.1$), (p,p′), (d,p), (t,p)
$5/2_1^-$	1762	26 fs	B(M1/E2$\rightarrow 7/2_1^-)^{>0.11}_{<0.18}/^{<19}_{>1}$ W.u., log $ft = 5.60$ (β^- from $7/2^-$), (γ,γ'), (p,p′), (d,p), (p,d), (d,t), (t,p)
$1/2_1^+$	2504		(γ,γ'), (p,p′), (d,p), (p,d), (d,t)
$15/2_1^-$	2506		B(E2/M3$\rightarrow 11/2_1^-)^{<18.3}_{>0.0093}/ > 0.40$ W.u., (p,p′)
$1/2_2^-$	3175	54.8 fs	(p,p′), (d,p), (p,d), (d,t), (t,p)
$3/2_3^-$	3261	11.2 fs	(p,p′), (d,p), (t,p)
$3/2_4^-$	3428		(p,p′), (d,p), (p,d), (d,t), (t,p)
$1/2_3^-$	3469		(d,p)
$5/2_2^-$	3512		(γ,γ'), (p,p′), (d,p), (t,p)
$5/2_3^-$	3618		(p,p′), (d,p), (t,p)
$3/2_5^-$	3788	<16 fs	(d,p), (t,p)
$5/2_4^-$	3855		(γ,γ'), (p,p′), (d,p), (p,d), (d,t), (t,p)
$1/2_4^-$	4222	<22 fs	(p,p′), (d,p)
$7/2_2^-$	4245		(γ,γ'), (p,d), (d,t)
$3/2_6^-$	4433		(d,p)
$1/2_2^+$	4456		(d,p), (p,d), (d,t)
$5/2_1^+$	4507		(γ,γ'), (d,p)
$1/2_3^+$	4561		(p,d), (d,t)
$3/2_7^-$	4588		(d,p)
$1/2_5^-$	4667		(d,p)
$1/2_6^-$	4911		(d,p), (p,d), (d,t), (t,p)
$1/2_7^-$	5116	<10 fs	(d,p)
$1/2_4^+$	5255		(d,p)
$1/2_5^+$	5412	19 fs	(d,p)
$1/2_6^+$	5774		(d,p)
$5/2_5^-$	5861		(d,p), (t,p)
$1/2_7^+$	5931		(d,p)
$5/2_6^-$	6010		(d,p), (t,p)
$1/2_8^+$	6078		(d,p)
$1/2_9^+$	8133		
$7/2_1^+$	8885	2.29 eV	(γ,γ')



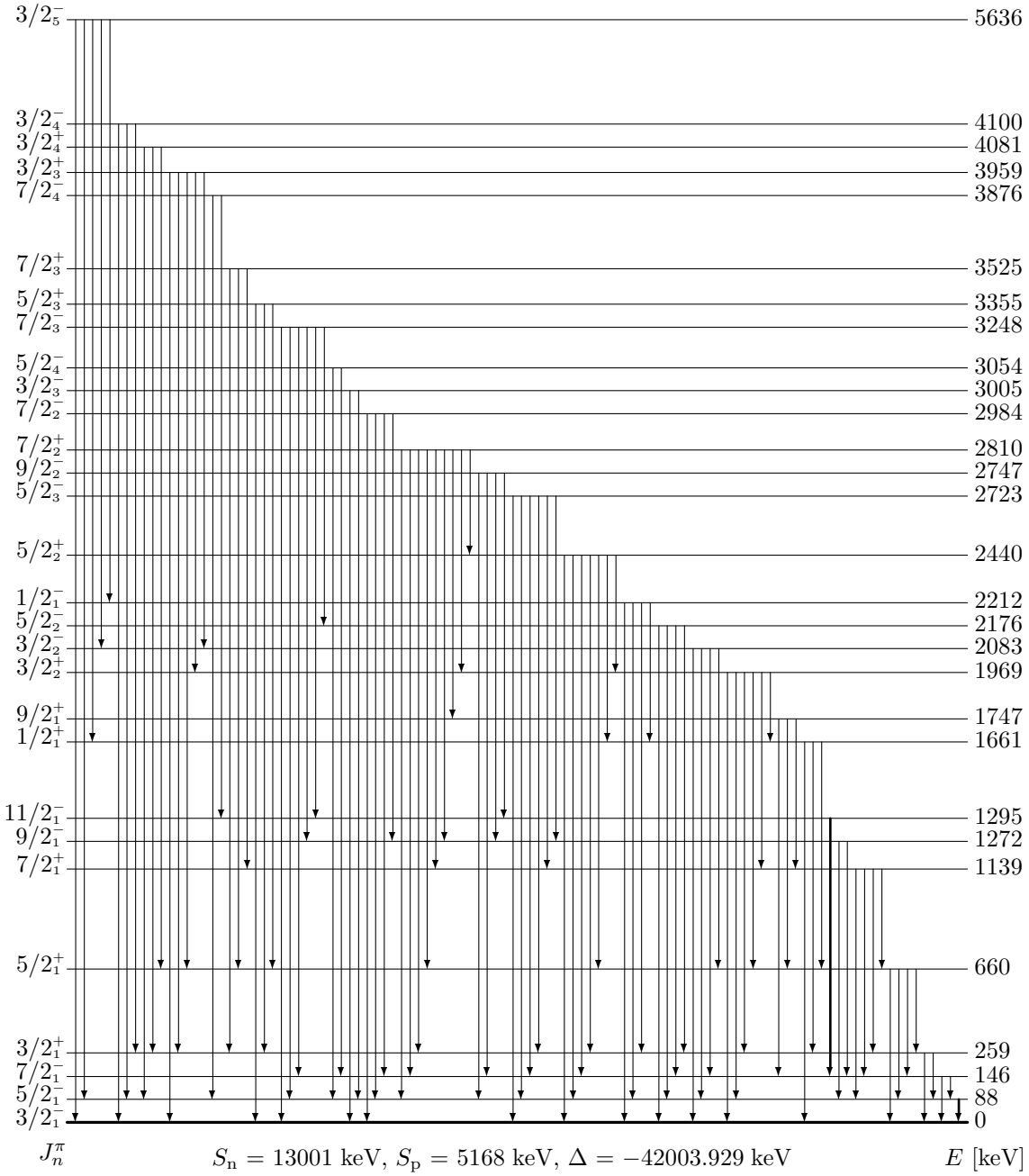
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95B2, 98B]
0_1^+	0	stable	Q = 0.08 barn, μ = −2.4 μ_n
2_1^+	1554	1.07 ps	B(E2→ 0_1^+) = 5.3 W.u., log ft = 7.90 (β^- from 5^+), (γ,γ'), Coul. ex., (e,e′), (p,p′), (α,α'), (d,p), (d,^{3}He), (t,p)
4_1^+	2675	5.3 ps	B(E2→ 2_1^+) = 5.5 W.u., log ft = 6.70 (β^- from 5^+), (e,e′), (p,p′), (α,α'), (d,p), (d,^{3}He), (t,p)
6_1^+	3199	418 ps	B(E2→ 4_1^+) = 3.14 W.u., log ft = 5.39 (β^- from 5^+), μ = 9.3 μ_n, (e,e′), (p,p′), (α,α'), (d,p), (d,^{3}He), (t,p)
4_2^+	4147	33 fs	log ft = 7.01 (β^- from 5^+), (p,p′), (α,α'), (d,p), (t,p)
2_2^+	4310	6.1 fs	B(M1/E2→ 2_1^+) = 0.14/3 W.u. (δ = −0.26), B(E2→ 0_1^+) = 0.93 W.u., (γ,γ'), (e,e′), (p,p′), (α,α'), (d,p), (d,^{3}He), (t,p)
2_3^+	4790	<14 fs	(p,p′), (α,α'), (d,p), (d,^{3}He), (t,p)
5_1^+	4881	215 fs	log ft = 5.99 (β^- from 5^+), (e,e′), (d,p)
4_3^+	5380	33 fs	B(E2→ 2_1^+) = 0.15 W.u., log ft = 6.37 (β^- from 5^+), (p,p′), (α,α'), (d,p), (t,p)
7_1^+	6135		(d,^{3}He)
3_1^-	6400		(d,^{3}He)
3_1^+	6481	17 fs	(p,p′), (α,α'), (d,p), (d,^{3}He), (t,p)
8_1^+	6540		
4_4^+	6711	11 fs	B(E2→ 2_1^+) = 0.33 W.u., (p,p′), (α,α'), (d,p), (d,^{3}He), (t,p)
3_2^-	6730		(d,p), (t,p)
9_1^+	6769		



J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [97C, 98B]
$3/2_1^-$	0	5.76 m	(d,p), (t,p)
$1/2_1^-$	1167	34 fs	B(M1→ $3/2_1^-$) = 0.41 W.u., (d,p), (t,p)
$7/2_1^-$	1437	0.42 ps	B(E2→ $3/2_1^-$) = 20 W.u., log ft = 5.60 (β^- from $(7/2)^-$), (d,p), (t,p)
$5/2_1^-$	2144	0.11 ps	B(M1/E2→ $7/2_1^-$) = 0.0074/34 W.u., B(E2→ $1/2_1^-$) = 8.9 W.u., B(M1/E2→ $3/2_1^-$) = 0.0088/4.4 W.u., log ft = 5.21 (β^- from $(7/2)^-$), (d,p), (t,p)
$3/2_2^-$	2198	9.7 fs	B(M1→ $1/2_1^-$) = 0.288 W.u., B(M1/E2→ $3/2_1^-$) = 0.0708/33.5 W.u., (d,p), (t,p)
$7/2_2^-$	2691		log ft = 6.17 (β^- from $(7/2)^-$), (d,p), (t,p)
$1/2_2^-$	2906	7.6 fs	B(M1→ $3/2_2^-$) = 2.30 W.u., B(M1/E2→ $1/2_1^-$) = 0.129/98 W.u., B(M1/E2→ $3/2_1^-$) = 0.0147/3.98 W.u., (d,p), (t,p)
$3/2_3^-$	3174	12 fs	B(M1→ $3/2_2^-$) = 0.22 W.u., B(M1/E2→ $1/2_1^-$) = 0.0092/5.2 W.u., B(M1/E2→ $3/2_1^-$) = 0.023/5.3 W.u., (d,p)
$9/2_1^+$	3771	0.12 ps	B(E1/M2→ $7/2_1^-$) = $9.2 \cdot 10^{-5}$/78 W.u., (d,p)
$1/2_1^+$	4820		(d,p)
$1/2_2^+$	4882		(d,p)

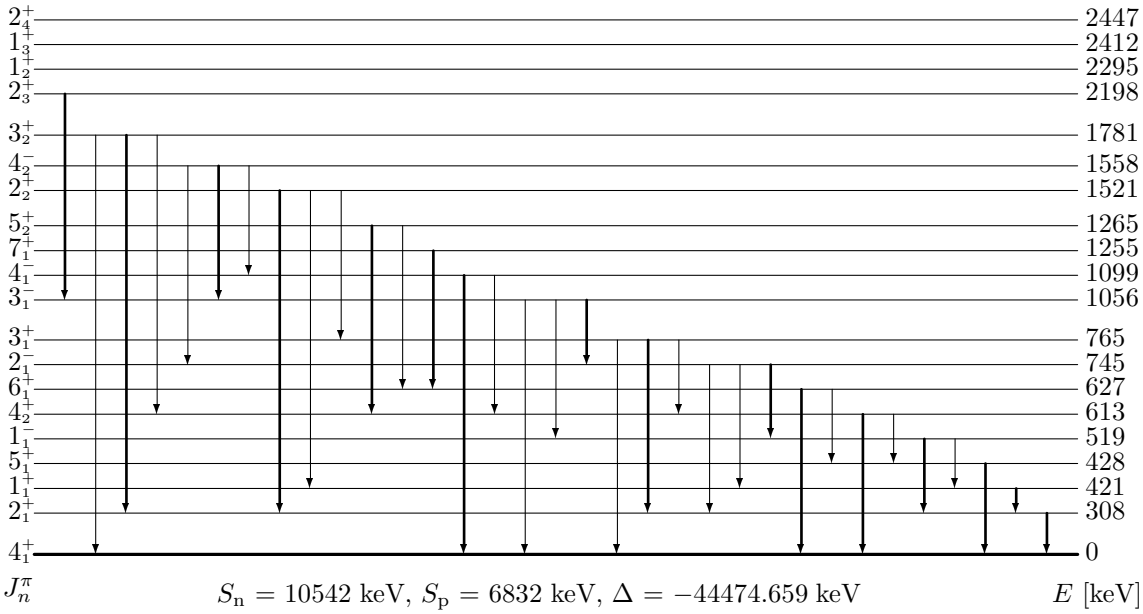


J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [94J, 98B]
0_1^+	0	1.7 m	(t,p)
2_1^+	1050	3.3 ps	B(E2→ 0_1^+) = 12 W.u., log ft = 6.38 (β^- from 3^+), (t,p)
2_2^+	2264	35 fs	B(M1→ 2_1^+) = 0.31 W.u., B(E2→ 0_1^+) = 2.7 W.u., log ft = 6.45 (β^- from 3^+), (t,p)
4_1^+	2318		log ft = 6.40 (β^- from 3^+), (t,p)
2_3^+	2432	<70 fs	B(M1/E2→ 2_1^+) > 0.090/ > 11 W.u. (δ = −0.39), log ft = 6.62 (β^- from 3^+), (t,p)
4_2^+	3350		log ft = 6.19 (β^- from 3^+), (t,p)
3_1^-	3453		log ft = 6.56 (β^- from 3^+), (t,p)
2_4^+	3589	<62 fs	(t,p)
3_2^-	3872		(t,p)
2_5^+	3922		log ft = 5.99 (β^- from 3^+), (t,p)
1_1^-	4212		(t,p)

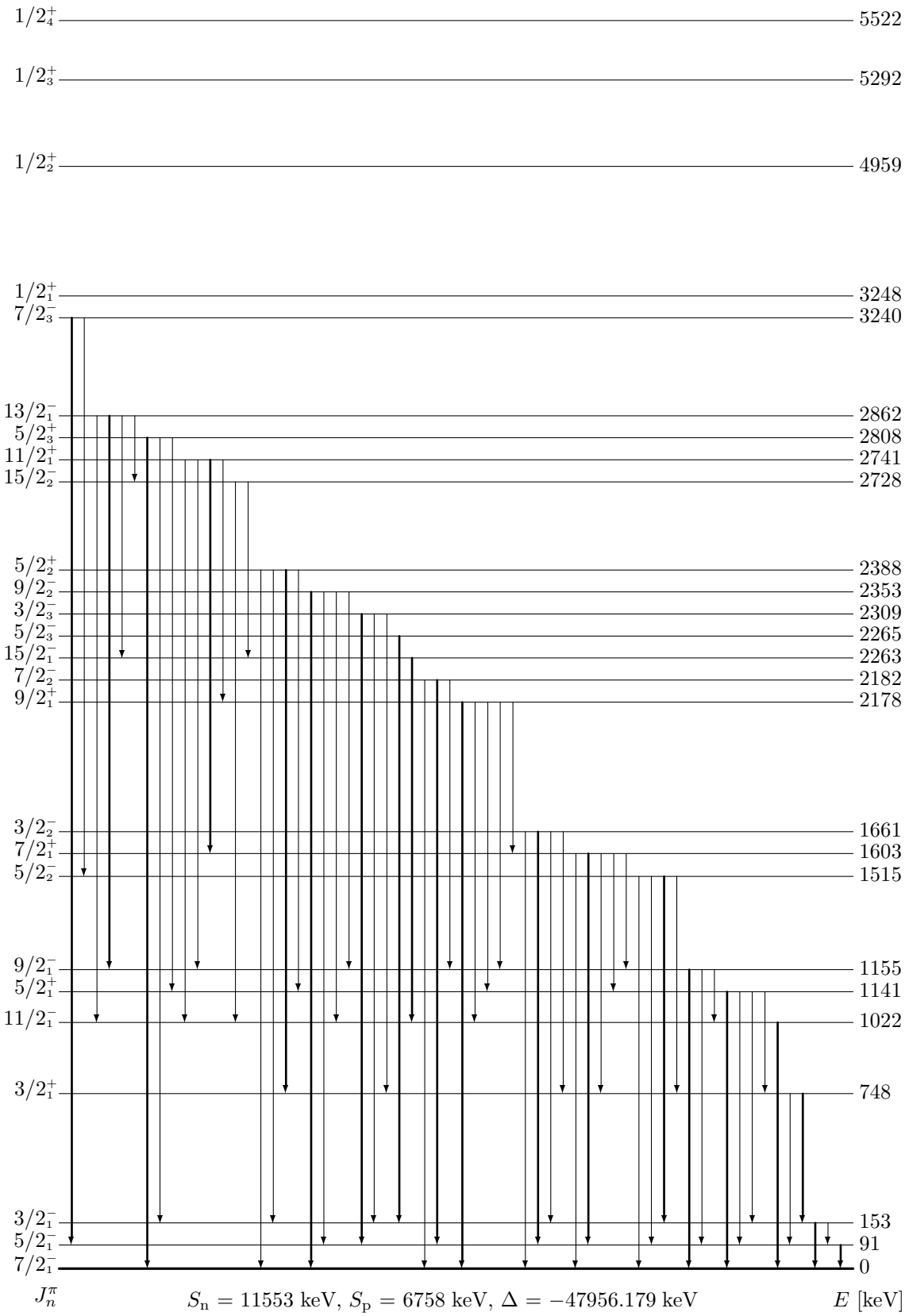


J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95B1, 98B]
3/2$^-_1$	0	32.6 m	log ft = 3.70 (β^+ from 3/2$^-$), (d,n), (^{3}He,d), (p,n), (^{3}He,t)
5/2$^-_1$	88	0.68 ns	B(M1/E2→ 3/2$^-_1$) = 0.046/2.4 · 10^2 W.u. (δ = 0.125), log ft = 5.10 (β^+ from 3/2$^-$)
7/2$^-_1$	146	0.51 ns	B(E2→ 3/2$^-_1$) = 9 W.u.
3/2$^+_1$	259	58 ps	(d,n), (^{3}He,d), (p,n)

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95B1, 98B]
$5/2_1^+$	660	1.6 ps	B(M1→ $3/2_1^+$) = 0.06 W.u., (d,n), (^{3}He,d), (p,n)
$7/2_1^+$	1139	1.2 ps	B(E2→ $3/2_1^+$) = 29 W.u., B(E1/M2→ $5/2_1^-$) = 0.00014/1.5 W.u. (δ = 0.05), (p,n)
$9/2_1^-$	1272	0.25 ps	B(E2→ $5/2_1^-$) = 18 W.u., (p,n)
$11/2_1^-$	1295	1.4 ps	B(E2→ $7/2_1^-$) = 20 W.u., (p,n)
$1/2_1^+$	1661	0.37 ps	(d,n), (^{3}He,d), (p,n)
$9/2_1^+$	1747	624 fs	B(E2→ $5/2_1^+$) = 27.6 W.u., B(E1→ $7/2_1^-$) = $7.4 \cdot 10^{-5}$ W.u., (p,n)
$3/2_2^+$	1969	0.44 ps	B(E1/M2→ $5/2_1^-$) = 0.00010/0.01 W.u. (δ = −0.01), B(E1/M2→ $3/2_1^-$) = $4.4 \cdot 10^{-6}$/0.002 W.u. (δ = −0.02) B(E2→ $7/2_1^+$) = 2.9 W.u.,
$3/2_2^-$	2083	15 fs	B(E2→ $7/2_1^-$) = 2.3 W.u., (d,n), (^{3}He,d)
$5/2_2^-$	2176	15 fs	B(M1/E2→ $5/2_1^-$) = 0.026/4.8 W.u. (δ = 0.56)
$1/2_1^-$	2212	83 fs	B(E2→ $5/2_1^-$) = 0.67 W.u., (d,n), (^{3}He,d)
$5/2_2^+$	2440	65 fs	B(M1/E2→ $3/2_2^+$) = 0.35/26 W.u. (δ = 0.08), B(E2→ $1/2_1^+$) = 27 W.u., B(E1/M2→ $7/2_1^-$) = 0.000101/0.3 W.u. (δ = 0.06), B(E1/M2→ $3/2_1^-$) = $4.4 \cdot 10^{-5}$/0.08 W.u. (δ = 0.05)
$5/2_3^-$	2723	36 fs	B(M1/E2→ $5/2_1^-$) = 0.00040/2.1 W.u. (δ = −3.8), B(M1/E2→ $3/2_1^-$) = 0.0036/4.5 W.u. (δ = 1.9), B(E2→ $9/2_1^-$) = 1.9 W.u., (d,n), (^{3}He,d)
$9/2_2^-$	2747	25 fs	B(M1/E2→ $7/2_1^-$) = 0.035/2.8 W.u. (δ = −0.46), B(E2→ $5/2_1^-$) = 1.2 W.u.
$7/2_2^+$	2810	0.11 ps	B(E2→ $3/2_2^+$) = 39 W.u., B(M1/E2→ $9/2_1^+$) = 0.019/3.5 W.u. (δ = −0.29), B(E1/M2→ $9/2_1^-$) = 0.00014/0.11 W.u. (δ = 0.02), B(M1/E2→ $5/2_1^+$) = 0.0044/0.20 W.u. (δ = −0.29), B(E1/M2→ $5/2_1^-$) = 0.00010/0.006 W.u. (δ = 0.01)
$7/2_2^-$	2984	5 fs	B(M1/E2→ $9/2_1^-$) = 0.25/4.9 W.u. (δ = 0.15), B(M1/E2→ $7/2_1^-$) = 0.11/0.8 W.u. (δ = 0.15)
$3/2_3^-$	3005	6 fs	(d,n), (^{3}He,d)
$5/2_4^-$	3054	5 fs	
$7/2_3^-$	3248	76 fs	B(M1/E2→ $5/2_2^-$) = 0.047/16 W.u. (δ = 0.39), (d,n), B(E2→ $11/2_1^-$) = 3.1 W.u., B(E2→ $3/2_1^-$) = 0.36 W.u., (^{3}He,d)
$5/2_3^+$	3355	5 fs	B(M1/E2→ $5/2_1^+$) = 0.040/0.1 W.u. (δ = 0.09), B(E1/M2→ $3/2_1^-$) = 0.00011/0.2 W.u. (δ = 0.06)
$7/2_3^+$	3525	9.7 fs	B(M1/E2→ $7/2_1^+$) = 0.053/0.010 W.u. (δ = −0.02), B(M1/E2→ $5/2_1^+$) = 0.064/0.002 W.u. (δ = −0.01), B(E2→ $3/2_1^+$) = 0.25 W.u.
$7/2_4^-$	3876	<11 fs	(d,n), (^{3}He,d)
$3/2_3^+$	3959	9.0 fs	B(M1/E2→ $3/2_1^+$) = 0.005/1.7 W.u. (δ = −1.3), B(E1/M2→ $3/2_1^-$) = 0.00037/1 W.u. (δ = −0.10)
$3/2_4^+$	4081	15 fs	
$3/2_4^-$	4100	5.5 fs	(d,n), (^{3}He,d)
$3/2_5^-$	5636	<19 fs	
$1/2_2^-$	6023	<1.4 fs	
$1/2_2^+$	6040		(d,n), (^{3}He,d)
$1/2_3^+$	6132	<1.4 fs	
$5/2_4^+$	6229	<3 fs	
$3/2_6^-$	6296	<1.4 fs	(d,n), (^{3}He,d)
$5/2_5^+$	6394	<1.4 fs	(d,n), (^{3}He,d)



J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93B1, 98B]
4^+_1	0	15.9735 d	μ = 2.012 μ_n, (p,n), (^{3}He,d), (^{3}He,t), (^{3}He,p), (d,α)
2^+_1	308	7.11 ns	B(E2→ 4^+_1) = 2.760 W.u., Q = 0.444 barn, (^{3}He,d), (^{3}He,t), (^{3}He,p), (d,α)
1^+_1	421	<1 ns	log ft = 4.31 (β^+ from 0), (^{3}He,t), (^{3}He,p), (d,α)
5^+_1	428	6.1 ps	B(M1/E2→ 4^+_1) = 0.045/10 W.u. (δ = −0.13), (^{3}He,d)
1^-_1	519	2.72 ns	B(E1→ 1^+_1) = 6.7 · 10^{-5} W.u., B(E1/M2→ 2^+_1) = 1.32 · 10^{-5}/1 W.u. (δ = 0.03), (^{3}He,d), (d,α)
4^+_2	613	15.0 ps	B(M1/E2→ 5^+_1) = 0.025/ < 4 W.u. (δ = 0.01), B(M1/E2→ 4^+_1) = 0.0047/6.0 W.u. (δ = −0.44), (^{3}He,d), (^{3}He,t), (^{3}He,p), (d,α)
6^+_1	627	75 ps	B(M1/E2→ 5^+_1) = 0.015/18 W.u. (δ = −0.14), B(E2→ 4^+_1) = 4.4 W.u., (^{3}He,d), (^{3}He,t)
2^-_1	745	17.3 ps	B(M1/E2→ 1^-_1) = 0.101/2 W.u. (δ = −0.02), (^{3}He,t)
3^+_1	765	≤2.6 ps	(^{3}He,d), (^{3}He,t), (d,α)
3^-_1	1056	4.5 ps	B(E2→ 1^-_1) = 22 W.u., (^{3}He,d), (^{3}He,t), (d,α)
4^-_1	1099	4.5 ps	B(E1→ 4^+_1) = 7.8 · 10^{-5} W.u., (^{3}He,d), (^{3}He,t), (d,α)
7^+_1	1255	<3.5 ps	(^{3}He,t), (^{3}He,p)
5^+_2	1265	≤1.9 ps	(^{3}He,t), (d,α)
2^+_2	1521	≤3.0 ps	(^{3}He,d), (^{3}He,t), (d,α)
4^-_2	1558	≤2.8 ps	(^{3}He,t), (d,α)
3^+_2	1781		(^{3}He,d), (^{3}He,t), (d,α)
2^+_3	2198		(^{3}He,d), (d,α)
1^+_2	2295		(^{3}He,t), (^{3}He,p), (d,α)
1^+_3	2412		(^{3}He,d), (^{3}He,t), (^{3}He,p), (d,α)
2^+_4	2447		(^{3}He,d), (^{3}He,t), (^{3}He,p)
2^+_5	3243		(^{3}He,d)
1^+_4	3699		(^{3}He,d), (^{3}He,p)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1/2+2 4959
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7/2−3 3240
13/2−1 2862
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11/2+1 2741
15/2−2 2728
5/2+2 2388
9/2−2 2353
3/2−3 2309
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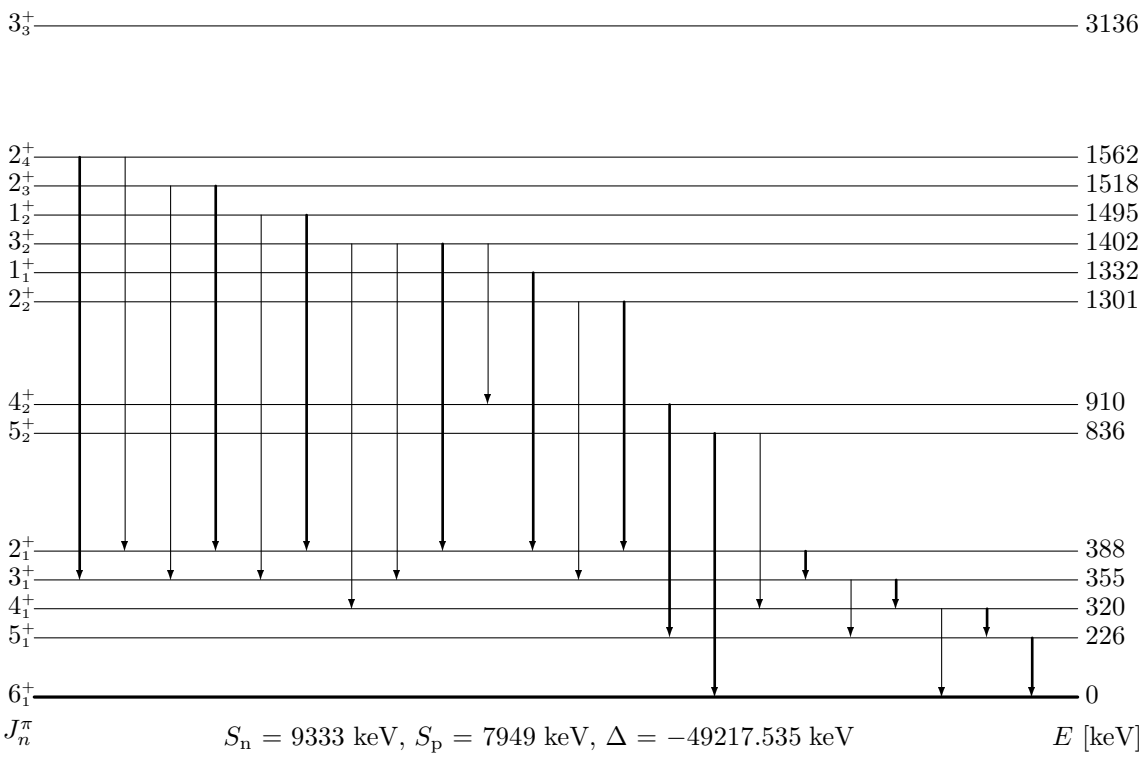
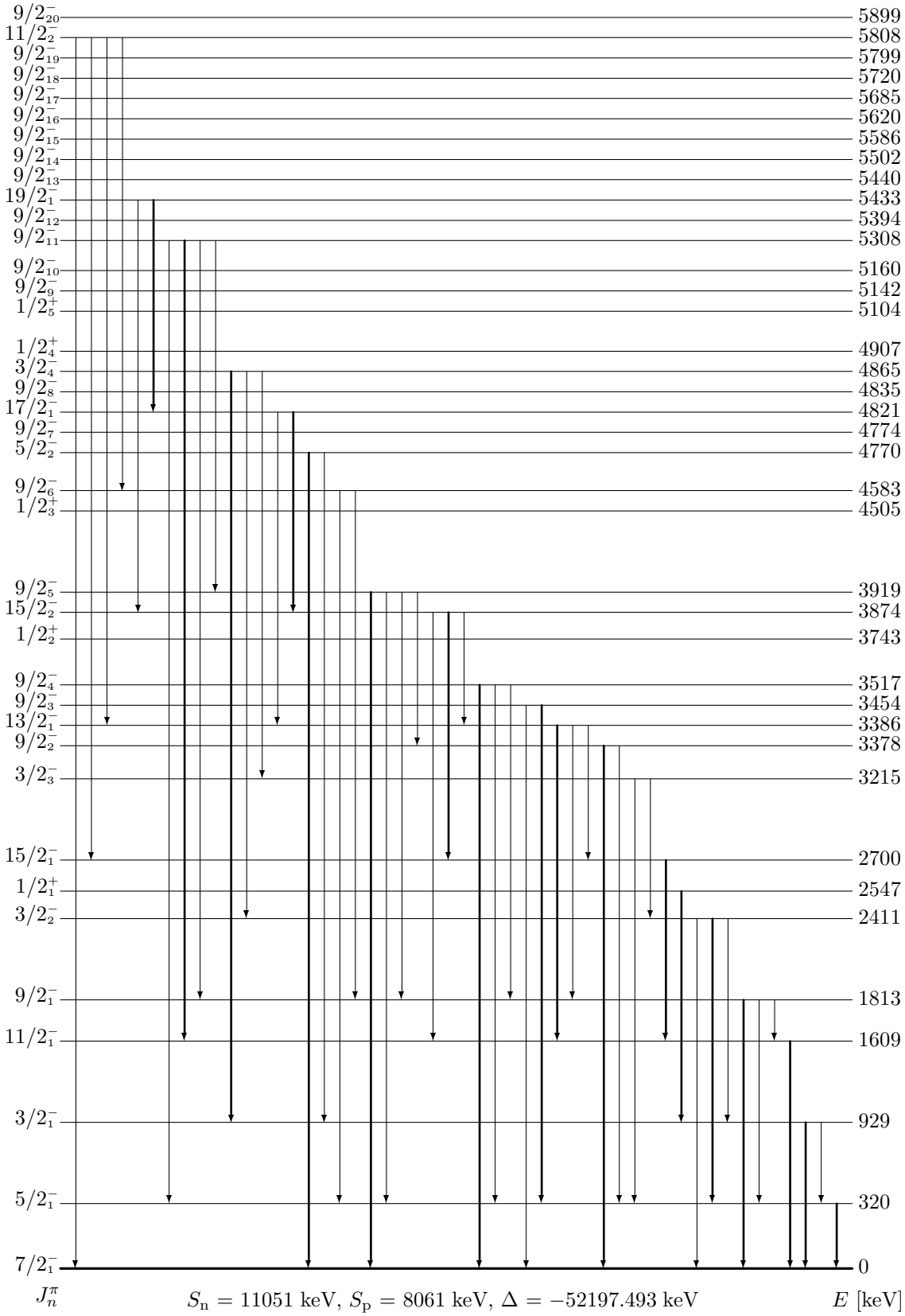
5/2−2 1515
9/2−1 1155
5/2+1 1141
11/2−1 1022
3/2+1 748
3/2−1 153
5/2−1 91
7/2−1 0
J^π_n
S_n = 11553 keV, S_p = 6758 keV, Δ = −47956.179 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95B3, 98B]
$7/2_1^-$	0	330 d	log ft = 5.60 (β^+ from $5/2^-$), μ = 4.47 μ_n, (p,n), (^{3}He,d), (p,t), (t,α)
$5/2_1^-$	91	228 ps	log ft = 5.02 (β^+ from $5/2^-$), (p,n), (^{3}He,d), (p,t), (t,α)
$3/2_1^-$	153	19.90 ns	B(M1→ $5/2_1^-$) = 0.00149 W.u., log ft = 4.81 (β^+ from $5/2^-$), μ = 2.37 μ_n, (p,n), (^{3}He,d), (p,t), (t,α)
$3/2_1^+$	748	5.3 ps	B(E1/M2→ $3/2_1^-$) = 0.00024/ < 3.7 W.u. (δ = −0.02), log ft = 8.90 (β^+ from $5/2^-$), (p,n), (^{3}He,d), (t,α)
$11/2_1^-$	1022	3.4 ps	(p,n), (^{3}He,d), (p,t), (t,α)
$5/2_1^+$	1141	1.3 ps	B(E1/M2→ $3/2_1^-$) = 7. · 10^{-5}/0.5 W.u. (δ = −0.04), B(E1/M2→ $7/2_1^-$) = 0.00014/1 W.u. (δ = −0.05), (p,n), (^{3}He,d)
$9/2_1^-$	1155	1.1 ps	B(M1→ $11/2_1^-$) = 0.23 W.u., B(M1/E2→ $7/2_1^-$) = 0.0067/5.9 W.u. (δ = 0.70), B(E2→ $5/2_1^-$) = 7.9 W.u., (p,n), (^{3}He,d), (p,t), (t,α)
$5/2_2^-$	1515	31 fs	B(M1/E2→ $3/2_1^-$) = 0.10/42 W.u. (δ = −0.57), B(M1/E2→ $5/2_1^-$) = 0.017/7 W.u. (δ = −0.6), log ft = 5.80 (β^+ from $5/2^-$), (p,n), (p,t), (t,α)
$7/2_1^+$	1603	0.47 ps	B(E1→ $9/2_1^-$) = 0.00011 W.u., B(E2→ $3/2_1^+$) = 21 W.u., B(M1/E2→ $5/2_1^+$) = 0.036/1 W.u. (δ = −0.05), B(E1→ $5/2_1^-$) = 0.00017 W.u., B(E1/M2→ $7/2_1^-$) = 7. · 10^{-5}/10 W.u. (δ = 0.29), (p,n)
$3/2_2^-$	1661	16 fs	B(M1→ $5/2_1^-$) = 0.18 W.u., log ft = 6.15 (β^+ from $5/2^-$), (p,n), (^{3}He,d), (p,t)
$9/2_1^+$	2178	0.56 ps	B(E2→ $5/2_1^+$)$^{>7}_{<16}$ W.u., (p,n), (t,α)
$7/2_2^-$	2182	33 fs	log ft = 7.19 (β^+ from $5/2^-$), (p,n), (^{3}He,d), (p,t), (t,α)
$15/2_1^-$	2263	0.65 ps	(p,n), (p,t)
$5/2_3^-$	2265	35 fs	(p,n), (t,α)
$3/2_3^-$	2309	14 fs	B(E2→ $7/2_1^-$) = 12 W.u., (p,n), (^{3}He,d), (p,t), (t,α)
$9/2_2^-$	2353	33 fs	B(M1/E2→ $11/2_1^-$) = 0.09/4 W.u. (δ = −0.19), B(M1/E2→ $7/2_1^-$) = 0.022/2.9 W.u. (δ = −0.54), (p,n), (p,t), (t,α)
$5/2_2^+$	2388	57 fs	B(M1/E2→ $3/2_1^+$) = 0.045/5 W.u. (δ = −0.36), (p,n), (^{3}He,d), (t,α)
$15/2_2^-$	2728	0.10 ps	B(M1/E2→ $15/2_1^-$) = 1.1/ < 1.2 · 10^2 W.u., B(E2→ $11/2_1^-$) = 18 W.u., (p,n), (p,t), (t,α)
$11/2_1^+$	2741	0.39 ps	B(E2→ $7/2_1^+$) = 33 W.u., B(E1→ $9/2_1^-$) = 0.00012 W.u., B(E1→ $11/2_1^-$) = 6. · 10^{-6} W.u.
$5/2_3^+$	2808	0.32 ps	(p,n), (t,α)
$13/2_1^-$	2862	0.10 ps	B(E2→ $9/2_1^-$) = 27 W.u., (p,t)
$7/2_3^-$	3240	<33.3 ps	(p,n), (p,t)
$1/2_1^+$	3248		(^{3}He,d), (t,α)
$1/2_2^+$	4959		(t,α)
$1/2_3^+$	5292		(t,α)
$1/2_4^+$	5522		(t,α)
$3/2_4^-$	7745	8.9 eV	B(M1/E2→ $3/2_1^-$) = 0.017/0.00038 W.u. (δ = −0.023), B(M1→ $5/2_1^-$) = 0.012 W.u., B(E2/M3→ $7/2_1^-$) = 0.036/1.7 W.u. (δ = −0.02), (^{3}He,d)



J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95B2, 98B]
6_1^+	0	1.4·10^{17} y	Q = 0.209 barn, μ = 3.356889 μ_n, Coul. ex., (p,p′), (d,d′), (p,n), (p,d), (d,t), (^{3}He,t), (^{3}He,d), (p,^{3}He), (^{3}He,p)
5_1^+	226	3.7 ps	Coul. ex., (p,p′), (d,d′), (p,n), (p,d), (d,t), (^{3}He,t), (^{3}He,d), (p,^{3}He), (^{3}He,p)
4_1^+	320	56 ps	B(E2→ 6_1^+) = 4.1 W.u., Coul. ex., (p,p′), (d,d′), (p,n), (p,d), (d,t), (^{3}He,t), (^{3}He,d), (p,^{3}He)
3_1^+	355	3 ns	(p,p′), (d,d′), (p,n), (p,d), (d,t), (^{3}He,t), (^{3}He,d), (p,^{3}He)
2_1^+	388		(p,p′), (d,d′), (p,n), (p,d), (d,t), (^{3}He,t), (^{3}He,d), (p,^{3}He)
5_2^+	836	54 fs	(p,p′), (d,d′), (p,n), (p,d), (d,t), (^{3}He,t), (^{3}He,d), (p,^{3}He)
4_2^+	910	68 fs	B(M1/E2→ 5_1^+) = 0.97/2.1 · 10^2 W.u. (δ = 0.21), (p,p′), (d,d′), (p,n), (p,d), (d,t), (^{3}He,d), (^{3}He,p)
2_2^+	1301	48 fs	B(M1/E2→ 2_1^+) = 0.40/16 W.u. (δ = 0.12), B(M1/E2→ 3_1^+) = 0.18/4 W.u. (δ = 0.09), (p,p′), (d,d′), (p,n), (p,d), (d,t), (^{3}He,d), (p,^{3}He), (^{3}He,p)
1_1^+	1332	17 fs	(p,p′), (d,d′), (p,n), (p,d), (d,t), (^{3}He,t), (^{3}He,d), (p,^{3}He), (^{3}He,p)
3_2^+	1402	>0.8 ps	(p,p′), (d,d′), (p,n), (p,d), (d,t), (^{3}He,t), (^{3}He,d), (p,^{3}He), (^{3}He,p)
1_2^+	1495	44 fs	B(M1/E2→ 2_1^+) = 0.24/1.6 · 10^2 W.u. (δ = −0.58), B(E2→ 3_1^+) = 7.·10^1 W.u., (p,n), (p,d), (d,t), (^{3}He,d), (p,^{3}He), (^{3}He,p)
2_3^+	1518	164 fs	B(M1/E2→ 2_1^+) = 0.076/0.50 W.u. (δ = 0.06), (p,p′), (d,d′), (p,n), (p,d), (d,t), (^{3}He,d), (p,^{3}He), (^{3}He,p)
2_4^+	1562	0.7 ps	B(M1→ 2_1^+) = 0.010 W.u., (p,p′), (d,d′), (p,n), (p,^{3}He), (^{3}He,p)
3_3^+	3136		(p,p′), (d,d′), (^{3}He,d), (p,^{3}He), (^{3}He,p)


9/2⁻20 5899
11/2⁻2 5808
9/2⁻19 5799
9/2⁻18 5720
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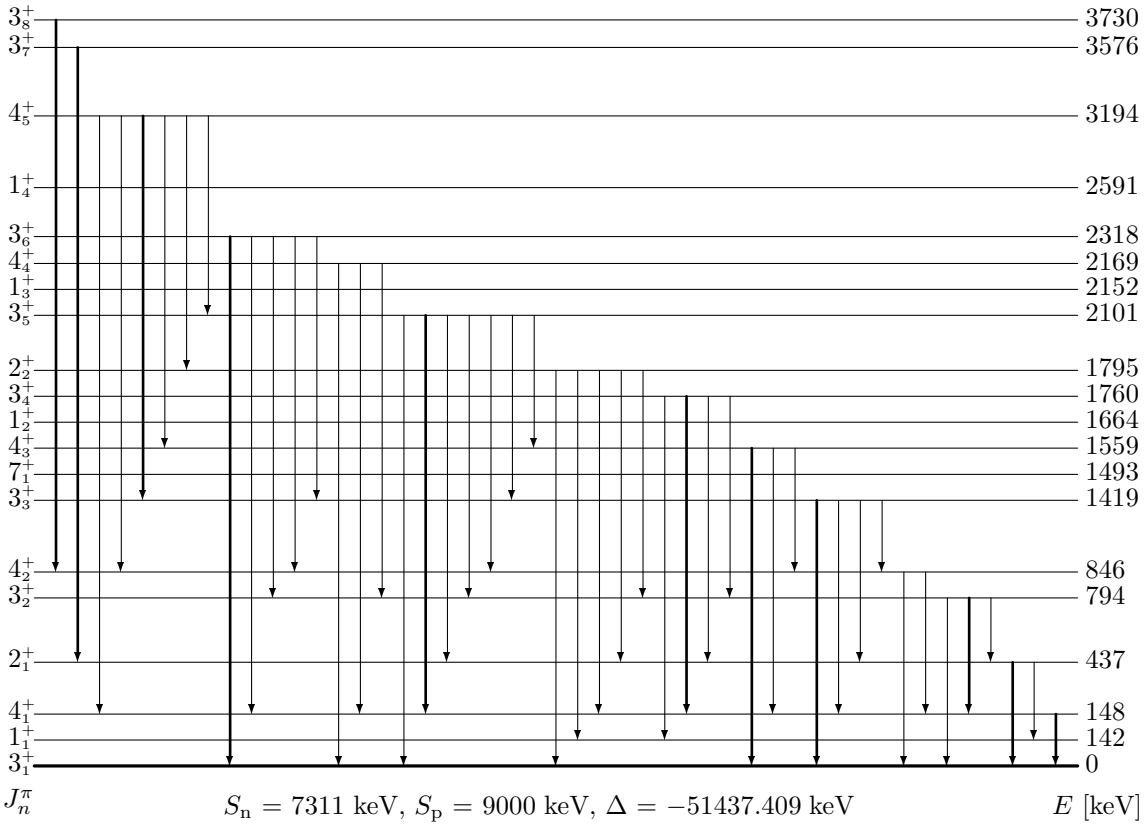
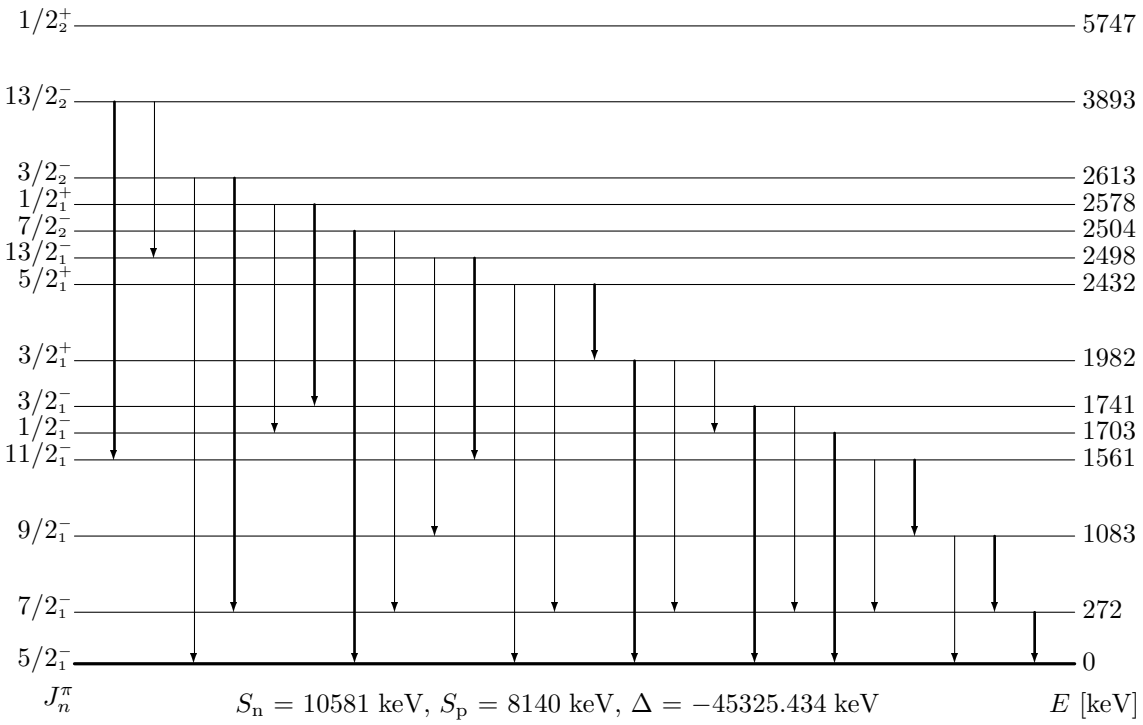
9/2⁻16 5620
9/2⁻15 5586
9/2⁻14 5502
9/2⁻13 5440
19/2⁻1 5433
9/2⁻12 5394
9/2⁻11 5308
9/2⁻10 5160
9/2⁻9 5142
1/2⁺5 5104
1/2⁺4 4907
3/2⁻4 4865
9/2⁻8 4835
17/2⁻1 4821
9/2⁻7 4774
5/2⁻2 4770
9/2⁻6 4583
1/2⁺3 4505
9/2⁻5 3919
15/2⁻2 3874
1/2⁺2 3743
9/2⁻4 3517
9/2⁻3 3454
13/2⁻1 3386
9/2⁻2 3378
3/2⁻3 3215
15/2⁻1 2700
1/2⁺1 2547
3/2⁻2 2411
9/2⁻1 1813
11/2⁻1 1609
3/2⁻1 929
5/2⁻1 320
7/2⁻1 0
J_n^π
$S_n = 11051$ keV, $S_p = 8061$ keV, $\Delta = -52197.493$ keV
E [keV]

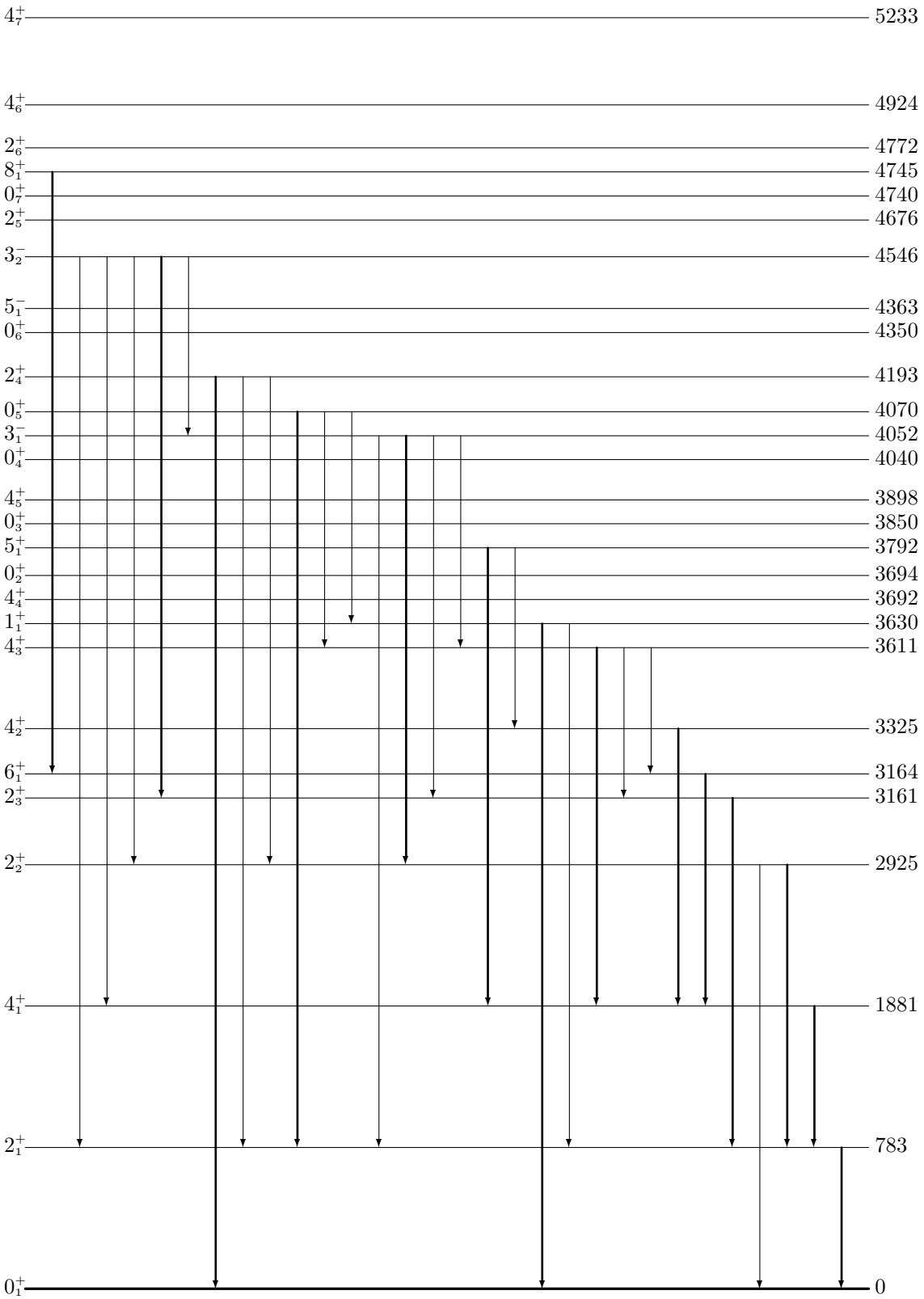
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [97C, 98B]
$7/2_1^-$	0	stable	log $ft = 5.39$ (β^+ from $7/2^-$), $Q = -0.043$ barn
$5/2_1^-$	320	184 ps	B(M1/E2$\rightarrow 7/2_1^-$) = 0.00300/14.5 W.u. ($\delta = 0.465$), $\mu = 3.86\ \mu_n$, log $ft = 4.90$ (β^- from $3/2^-$), log $ft = 5.86$ (β^+ from $7/2^-$)
$3/2_1^-$	929	8.3 ps	B(M1/E2$\rightarrow 5/2_1^-$) = $3.8 \cdot 10^{-5}$/10.0 W.u. ($\delta = 6.5$), B(E2$\rightarrow 7/2_1^-$) = 7.6 W.u., log $ft = 5.36$ (β^- from $3/2^-$), (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (d,p), (^{3}He,d)
$11/2_1^-$	1609	0.55 ps	B(E2$\rightarrow 7/2_1^-$) = 8.5 W.u., (e,e′), (p,p′), (d,d′), (α,α'), (d,p), (^{3}He,d)
$9/2_1^-$	1813	0.58 ps	B(M1$\rightarrow 11/2_1^-$) = 0.046 W.u., B(E2$\rightarrow 5/2_1^-$) = 2.8 W.u., B(M1/E2$\rightarrow 7/2_1^-$) = 0.00031/3.1 W.u. ($\delta = -3.8$), (e,e′), (d,d′), (α,α'), (p,γ), (d,p)
$3/2_2^-$	2411	14 fs	B(M1/E2$\rightarrow 5/2_1^-$) = 0.110/7 W.u. ($\delta = 0.36$), (e,e′), B(E2$\rightarrow 7/2_1^-$) = 8.6 W.u., (p,p′), (d,d′), (α,α'), (p,γ), (d,p), (^{3}He,d)
$1/2_1^+$	2547	>0.7 ps	B(E1$\rightarrow 3/2_1^-$) < 0.00017 W.u., (α,α'), (p,γ), (^{3}He,d)
$15/2_1^-$	2700	5.5 ps	B(E2$\rightarrow 11/2_1^-$) = 5.9 W.u., (e,e′), (d,d′), (α,α'), (d,p)
$3/2_3^-$	3215	26 fs	(e,e′), (p,p′), (p,γ), (^{3}He,d)
$9/2_2^-$	3378	56 fs	(p,p′), (d,p)
$13/2_1^-$	3386	>0.87 ps	B(M1/E2$\rightarrow 11/2_1^-$) < 0.0043/ < 3.1 W.u., (e,e′), (d,p)
$9/2_3^-$	3454	10 fs	B(E2$\rightarrow 5/2_1^-$) = 10 W.u., (p,p′), (α,α'), (d,p)
$9/2_4^-$	3517	17 fs	(p,p′), (d,p)
$1/2_2^+$	3743		(p,p′), (α,α')
$15/2_2^-$	3874	<0.15 ps	(p,p′), (d,p)
$9/2_5^-$	3919	14 fs	B(M1/E2$\rightarrow 9/2_1^-$) = 0.010/5.4 W.u., B(E2$\rightarrow 5/2_1^-$) = 2.2 W.u., B(M1/E2$\rightarrow 7/2_1^-$) = 0.0049/0.73 W.u., (d,p)
$1/2_3^+$	4505		(α,α')
$9/2_6^-$	4583		(d,p)
$5/2_2^-$	4770		(p,γ)
$9/2_7^-$	4774		(d,p)
$17/2_1^-$	4821	0.14 ps	B(M1/E2$\rightarrow 15/2_2^-$) < 0.22/ < $5.6 \cdot 10^2$ W.u., B(E2$\rightarrow 13/2_1^-$) = 4.7 W.u., (d,p)
$9/2_8^-$	4835		(d,p)
$3/2_4^-$	4865		(p,γ)
$1/2_4^+$	4907		(α,α')
$1/2_5^+$	5104		(^{3}He,d)
$9/2_9^-$	5142		(d,p)
$9/2_{10}^-$	5160		(d,p)
$9/2_{11}^-$	5308		(d,p)
$9/2_{12}^-$	5394		(d,p)
$19/2_1^-$	5433	0.16 ps	B(M1/E2$\rightarrow 17/2_1^-$) < 0.50/ < $3.1 \cdot 10^3$ W.u., B(E2$\rightarrow 15/2_2^-$) = 12 W.u.
$9/2_{13}^-$	5440		(d,p)
$9/2_{14}^-$	5502		(d,p)
$9/2_{15}^-$	5586		(d,p)
$9/2_{16}^-$	5620		(d,p)
$9/2_{17}^-$	5685		(d,p)
$9/2_{18}^-$	5720		(d,p)
$9/2_{19}^-$	5799		(d,p)
$11/2_2^-$	5808		
$9/2_{20}^-$	5899		(d,p)



J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [94J, 98B]
3^+_1	0	3.743 m	
1^+_1	142		log ft = 4.04 (β^- from 0^+), (^{3}He,p)
4^+_1	148		(d,p), (t,d)
2^+_1	437		(d,p), (t,d), (^{3}He,p)
3^+_2	794		(d,p)
4^+_2	846		(d,p), (t,d), (^{3}He,p)
3^+_3	1419		(d,p), (t,d), (^{3}He,p)
7^+_1	1493		(d,p)
4^+_3	1559		(d,p), (t,d)
1^+_2	1664		(d,p), (t,d), (^{3}He,p)
3^+_4	1760		(d,p), (t,d), (^{3}He,p)
2^+_2	1795		(d,p), (t,d), (^{3}He,p)
3^+_5	2101		(d,p), (t,d), (^{3}He,p)
1^+_3	2152		(^{3}He,p)
4^+_4	2169		(d,p)
3^+_6	2318		(d,p), (t,d), (^{3}He,p)
1^+_4	2591		(^{3}He,p)
4^+_5	3194		(d,p), (t,d)
3^+_7	3576		(d,p), (^{3}He,p)
3^+_8	3730		(^{3}He,p)



J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95B3, 98B]
$5/2_1^-$	0	42.3 m	log ft = 3.68 (β^+ from $5/2^-$), (p,d), μ = 0.476 μ_n
$7/2_1^-$	272	13 ps	B(M1/E2→ $5/2_1^-$) = 0.083/36 W.u. (δ = −0.115), log ft = 4.80 (β^+ from $5/2^-$), (p,d)
$9/2_1^-$	1083	0.15 ps	B(M1/E2→ $7/2_1^-$) = 0.25/40 W.u. (δ = −0.21), B(E2→ $5/2_1^-$) = 14 W.u., (p,d)
$11/2_1^-$	1561	0.37 ps	B(M1/E2→ $9/2_1^-$) = 0.28/10 W.u. (δ = −0.058), B(E2→ $7/2_1^-$) = 20 W.u., (p,d)
$1/2_1^-$	1703	>3.8 ps	(p,d)
$3/2_1^-$	1741	1.1 ps	B(E2→ $7/2_1^-$) = 2.0 W.u., B(M1/E2→ $5/2_1^-$) = 0.0027/0.024 W.u. (δ = 0.106), (p,d)
$3/2_1^+$	1982	>1.7 ps	(p,d)
$5/2_1^+$	2432	0.9 ps	B(M1/E2→ $3/2_1^+$) = 0.11/60 W.u. (δ = 0.21), B(M1→ $5/2_1^-$) = 0.0054 W.u., (p,d)
$13/2_1^-$	2498	0.16 ps	B(M1/E2→ $11/2_1^-$) = 0.15/0.4 W.u. (δ = −0.03), B(E2→ $9/2_1^-$) = 6 W.u.
$7/2_2^-$	2504	<8 fs	log ft = 4.30 (β^+ from $5/2^-$)
$1/2_1^+$	2578		(p,d)
$3/2_2^-$	2613	45 fs	B(E2→ $7/2_1^-$) = 10 W.u., B(M1→ $5/2_1^-$) = 0.011 W.u., (p,d)
$13/2_2^-$	3893		
$1/2_2^+$	5747		(p,d)
$1/2_3^+$	6006		(p,d)
$1/2_4^+$	6410		(p,d)
$1/2_5^+$	6470		(p,d)
$1/2_6^+$	6765		(p,d)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4^+_6 4924
2^+_6 4772
8^+_1 4745
0^+_7 4740
2^+_5 4676
3^-_2 4546
5^-_1 4363
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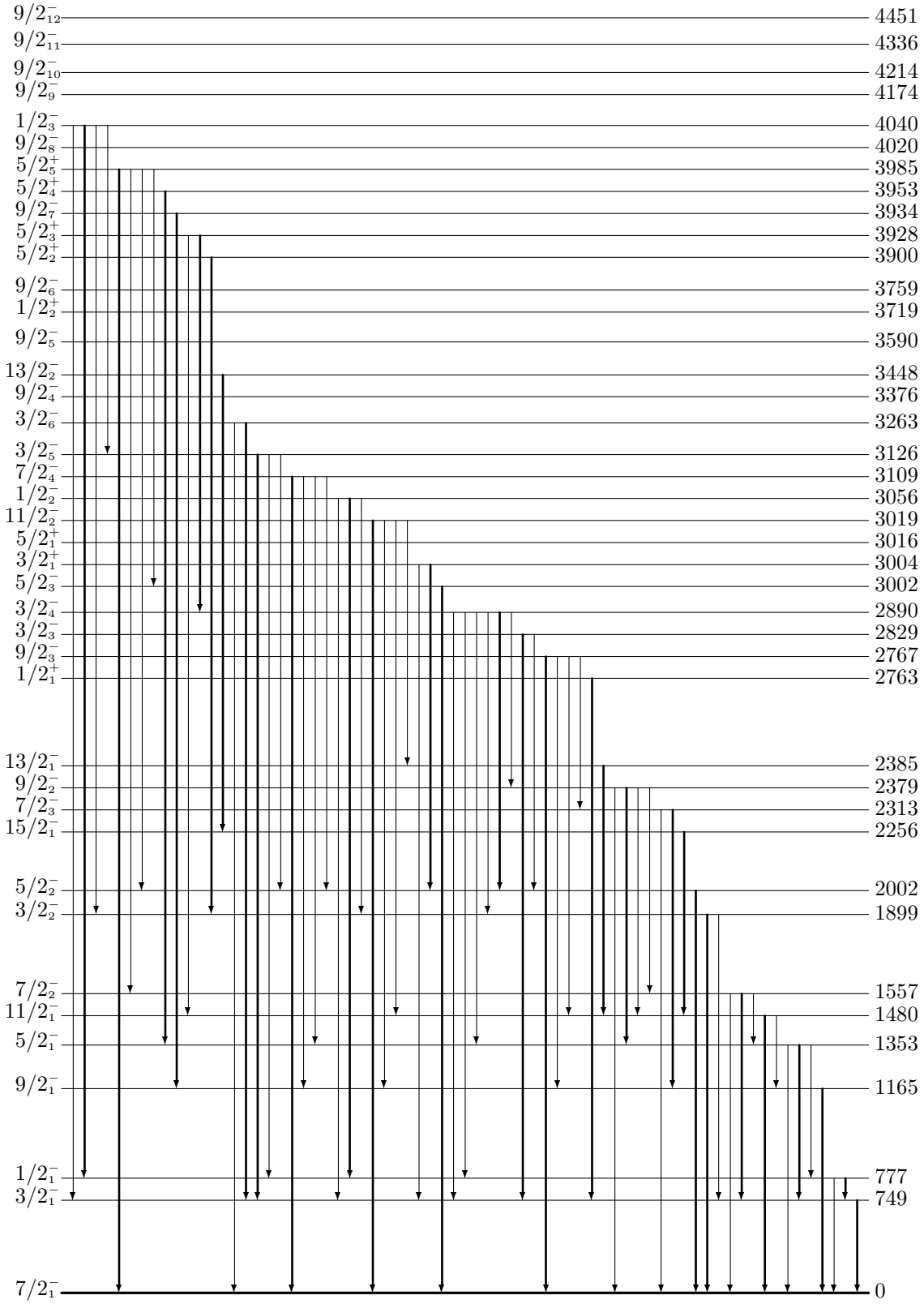
2^+_4 4193
0^+_5 4070
3^-_1 4052
0^+_4 4040
4^+_5 3898
0^+_3 3850
5^+_1 3792
0^+_2 3694
4^+_4 3692
1^+_1 3630
4^+_3 3611
4^+_2 3325
6^+_1 3164
2^+_3 3161
2^+_2 2925
4^+_1 1881
2^+_1 783
0^+_1 0
J^π_n
S_n = 13000 keV, S_p = 9587 keV, Δ = −50254.460 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95B2, 98B]
0_1^+	0	>1.8·10^{17} y	log ft = 3.48 (β^+ from 0^+), (γ,γ'), Coul. ex., (p,p′), (d,d′), (p,t)
2_1^+	783	8.87 ps	B(E2→ 0_1^+) = 19.8 W.u., Q = −0.36 barn, μ = 1.23 μ_n, Coul. ex., (e,e′), (p,p′), (d,d′), (p,t)
4_1^+	1881	2.22 ps	B(E2→ 2_1^+) = 14.6 W.u., (e,e′), (p,p′), (d,d′), (p,t)
2_2^+	2925	9.4 fs	B(M1→ 2_1^+) = 0.22 W.u., B(E2→ 2_1^+) < 0.5 W.u., B(E2→ 0_1^+) = 2.1 W.u., (p,p′), (d,d′), (p,t)
2_3^+	3161	10.9 fs	B(M1/E2→ 2_1^+) = 0.13/3.2 W.u. (δ = 0.24), (e,e′), (p,p′), (d,d′), (p,t)
6_1^+	3164	1.25 ps	B(E2→ 4_1^+) = 12 W.u., log ft = 6.00 (β^+ from 5^+), μ = 3.2 μ_n, (e,e′), (p,p′), (d,d′)
4_2^+	3325	97 fs	B(M1→ 4_1^+) = 0.074 W.u., B(E2→ 4_1^+) < 0.6 W.u., log ft = 5.00 (β^+ from 5^+), (e,e′), (p,p′), (d,d′), (p,t)
4_3^+	3611	6 fs	B(M1/E2→ 4_1^+) < 0.7/ < 6 · 10^2 W.u., (p,p′), (d,d′), (p,t)
1_1^+	3630	5 ps	B(M1/E2→ 2_1^+) < 6. · 10^{-5}/ < 0.018 W.u., B(M1→ 0_1^+) = 6 · 10^{-5} W.u., log ft = 7.10 (β^+ from 0^+), (e,e′)
4_4^+	3692		(p,p′), (d,d′)
0_2^+	3694		(p,t)
5_1^+	3792	9.0 ps	B(M1/E2→ 4_2^+) $^{>0.00015}_{<0.00078}$/$^{>28}_{<96}$ W.u., B(M1/E2→ 4_1^+) = 0.00013/0.018 W.u. (δ = −0.47), (p,p′), (d,d′)
0_3^+	3850		(p,p′), (d,d′)
4_5^+	3898		(p,p′), (d,d′), (p,t)
0_4^+	4040		(e,e′), (p,t)
3_1^-	4052	0.56 ps	B(E1→ 2_3^+) = 0.00025 W.u., B(E1→ 2_2^+) = 0.00030 W.u., B(E1→ 2_1^+) = 5.6 · 10^{-6} W.u., (p,p′), (d,d′), (p,t)
0_5^+	4070	6.5 fs	(p,p′), (d,d′), (p,t)
2_4^+	4193		(e,e′), (p,p′), (d,d′), (p,t)
0_6^+	4350		(p,t)
5_1^-	4363		(p,p′), (d,d′)
3_2^-	4546		(p,p′), (d,d′), (p,t)
2_5^+	4676		(p,p′), (d,d′)
0_7^+	4740		(p,t)
8_1^+	4745	2.8 ps	B(E2→ 6_1^+) > 1.9 W.u., μ = 4.3 μ_n, (p,p′), (d,d′)
2_6^+	4772		(p,p′), (d,d′)
4_6^+	4924		(p,p′), (d,d′)
4_7^+	5233		(p,p′), (d,d′)
10_1^+	6341	2.8 ps	B(E2→ 8_1^+) > 1.8 W.u., (p,p′), (d,d′)
3_3^-	6450		(p,p′), (d,d′)
3_4^-	6650		(p,p′), (d,d′)
3_5^-	6790		(p,p′), (d,d′)
11_1^+	6951		B(M1→ 10_1^+) $^{<0.34}_{>0.091}$ W.u.
12_1^+	7613	0.14 ps	
3_6^-	7860		(p,p′), (d,d′)
6_2^+	8425		
4_8^+	8478		
3_7^-	8680		(p,p′), (d,d′)
2_7^+	8813		


9/2⁻₁₂ 4451
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9/2⁻₁₀ 4214
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5/2⁺₄ 3953
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13/2⁻₁ 2385
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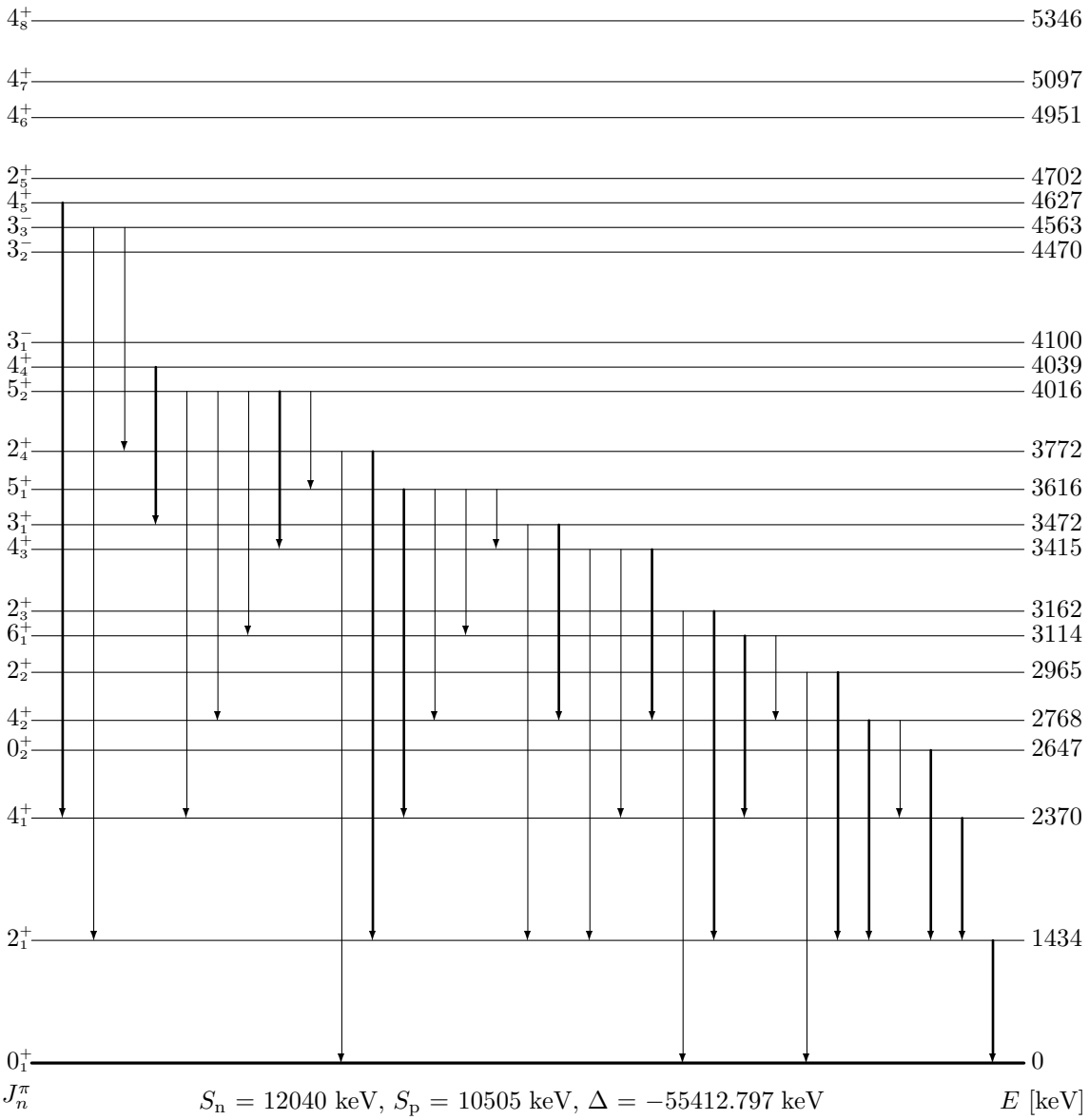
7/2⁻₃ 2313
15/2⁻₁ 2256
5/2⁻₂ 2002
3/2⁻₂ 1899
7/2⁻₂ 1557
11/2⁻₁ 1480
5/2⁻₁ 1353
9/2⁻₁ 1165
1/2⁻₁ 777
3/2⁻₁ 749
7/2⁻₁ 0
J^π_n
$S_n = 9262$ keV, $S_p = 9516$ keV, $\Delta = -51444.760$ keV
E [keV]

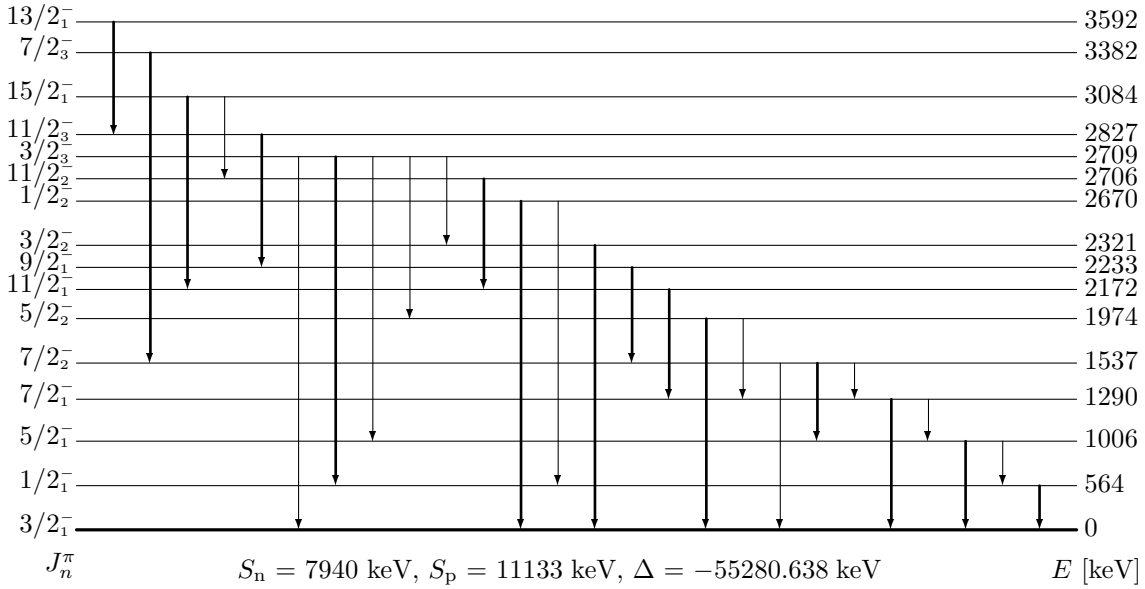
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [97C, 98B]
$7/2_1^-$	0	27.7025 d	log ft = 5.30 (β^+ from $5/2^-$)
$3/2_1^-$	749	3.3 ns	B(E2→ $7/2_1^-$) = 0.065 W.u., log ft = 7.20 (β^+ from $5/2^-$), $\mu = -0.86\ \mu_n$
$1/2_1^-$	777	6.9 ns	B(M1→ $3/2_1^-$) = 0.077 W.u., (p,n), (d,p)
$9/2_1^-$	1165	76 fs	B(M1/E2→ $7/2_1^-$) = 0.177/11 W.u. ($\delta = -0.19$), (p,n), (d,p), (^{3}He,α), (^{3}He,d)
$5/2_1^-$	1353	3.8 ps	B(E2→ $1/2_1^-$) = 26 W.u., B(M1/E2→ $3/2_1^-$) = 0.016/17 W.u. ($\delta = 0.40$), B(M1/E2→ $7/2_1^-$) = 0.00035/0.00035 W.u. ($\delta = 0.06$), log ft = 7.30 (β^+ from $5/2^-$), (p,n), (d,p), (^{3}He,α)
$11/2_1^-$	1480	0.55 ps	B(M1/E2→ $9/2_1^-$) = 0.7/0.7 W.u. ($\delta = 0.03$), B(E2→ $7/2_1^-$) = 6 W.u., (p,n), (d,p), (^{3}He,d)
$7/2_2^-$	1557	4.2 ps	B(M1→ $5/2_1^-$) = 0.031 W.u., B(E2→ $3/2_1^-$) = 28 W.u., B(M1/E2→ $7/2_1^-$) = 0.00017/0.023 W.u. ($\delta = -0.38$), log ft = 7.10 (β^+ from $5/2^-$), (p,n), (d,p), (^{3}He,α)
$3/2_2^-$	1899	0.28 ps	B(E2→ $7/2_1^-$) = 5.0 W.u., log ft = 7.20 (β^+ from $5/2^-$), (p,n), (d,p), (^{3}He,α)
$5/2_2^-$	2002	17 fs	B(M1/E2→ $7/2_1^-$) = 0.160/0.160 W.u. ($\delta = -0.09$), log ft = 6.30 (β^+ from $5/2^-$), (p,n), (d,p), (^{3}He,α), (^{3}He,d)
$15/2_1^-$	2256	45.8 ps	B(E2→ $11/2_1^-$) = 3.92 W.u., (p,n), (^{3}He,d)
$7/2_3^-$	2313	15 fs	B(M1→ $9/2_1^-$) = 0.83 W.u., B(M1→ $7/2_1^-$) = 0.018 W.u., log ft = 5.70 (β^+ from $5/2^-$), (p,n), (d,p), (^{3}He,α)
$9/2_2^-$	2379	0.31 ps	B(M1/E2→ $7/2_2^-$) = 0.006/31 W.u. ($\delta = 1.22$), B(M1/E2→ $11/2_1^-$) = 0.017/0.017 W.u. ($\delta = 0.02$), B(E2/M3→ $5/2_1^-$) = 33/33 W.u. ($\delta = 0.02$), B(M1/E2→ $9/2_1^-$) < 0.0063/ < 9.8 W.u., B(M1/E2→ $7/2_1^-$) = 0.0011/0.28 W.u. ($\delta = -0.78$), (p,n), (d,p)
$13/2_1^-$	2385	59 fs	B(M1/E2→ $11/2_1^-$) = 0.50/0.50 W.u. ($\delta = -0.10$), (^{3}He,α), (^{3}He,d)
$1/2_1^+$	2763	0.071 ps	B(E1→ $3/2_1^-$) = 0.00085 W.u., (d,p), (^{3}He,α)
$9/2_3^-$	2767	41 fs	B(M1/E2→ $7/2_3^-$) = 0.119/11 W.u. ($\delta = 0.09$), B(M1/E2→ $11/2_1^-$) = 0.055/0.055 W.u. ($\delta = 0.07$), B(M1/E2→ $7/2_1^-$) = 0.013/0.5 W.u. ($\delta = -0.35$), B(M1→ $9/2_1^-$) = 0.026 W.u., (^{3}He,d)
$3/2_3^-$	2829	59 fs	B(M1/E2→ $3/2_1^-$) = 0.017/0.017 W.u. ($\delta = 0.09$), B(M1→ $5/2_2^-$) = 0.22 W.u., log ft = 6.00 (β^+ from $5/2^-$), (d,p), (^{3}He,α)
$3/2_4^-$	2890	0.35 ps	(d,p)
$5/2_3^-$	3002	15 ps	B(M1/E2→ $7/2_1^-$) = $5.4 \cdot 10^{-5}$/$5.4 \cdot 10^{-5}$ W.u. ($\delta = -0.07$)
$3/2_1^+$	3004	0.34 ps	B(E1/M2→ $5/2_2^-$) = 0.00078/0.00078 W.u. ($\delta = 0.12$), B(E1/M2→ $3/2_1^-$) < $6.5 \cdot 10^{-5}$/ < 59 W.u., (d,p), (^{3}He,α)
$5/2_1^+$	3016		(d,p), (^{3}He,α)
$11/2_2^-$	3019	54 fs	B(M1→ $13/2_1^-$) = 0.29 W.u., B(M1→ $11/2_1^-$) = 0.007 W.u., B(M1→ $9/2_1^-$) = 0.012 W.u., B(E2→ $7/2_1^-$) = 2.1 W.u.
$1/2_2^-$	3056	69 fs	B(M1→ $3/2_2^-$) = 0.05 W.u., (d,p)
$7/2_4^-$	3109	54 fs	B(M1/E2→ $9/2_1^-$) = 0.013/0.013 W.u. ($\delta = -0.18$), (d,p)
$3/2_5^-$	3126	83 fs	(d,p), (^{3}He,α)
$3/2_6^-$	3263	31 fs	B(M1/E2→ $3/2_1^-$) < 0.039/ < 14 W.u., B(E2→ $7/2_1^-$) = 1.8 W.u., (p,n), (d,p)
$9/2_4^-$	3376		(^{3}He,d)
$13/2_2^-$	3448	<70 fs	B(M1→ $15/2_1^-$) > 0.18 W.u., (^{3}He,d)

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [97C, 98B]
$9/2^-_5$	3590		(^{3}He,d)
$1/2^+_2$	3719		(d,p)
$9/2^-_6$	3759		(^{3}He,d)
$5/2^+_2$	3900	55 fs	B(E1$\rightarrow 3/2^-_2$) $= 8.\cdot 10^{-5}$ W.u., B(E1$\rightarrow 7/2^-_1$) $= 0.00014$ W.u.
$5/2^+_3$	3928	<25 fs	B(E1$\rightarrow 3/2^-_4$) > 0.0068 W.u., B(E1$\rightarrow 7/2^-_1$) $> 9.1\cdot 10^{-5}$ W.u., (d,p)
$9/2^-_7$	3934		(^{3}He,d)
$5/2^+_4$	3953	31 fs	B(E1$\rightarrow 5/2^-_1$) $= 0.00028$ W.u., B(E1$\rightarrow 3/2^-_1$) $= 0.00012$ W.u., B(E1$\rightarrow 7/2^-_1$) $= 0.00011$ W.u.
$5/2^+_5$	3985	22 fs	B(E1$\rightarrow 5/2^-_3$) $= 0.007$ W.u., B(E1$\rightarrow 5/2^-_2$) $= 0.00045$ W.u., B(E1$\rightarrow 7/2^-_2$) $= 0.00014$ W.u., B(E1$\rightarrow 7/2^-_1$) $= 0.00015$ W.u.
$9/2^-_8$	4020		(^{3}He,d)
$1/2^-_3$	4040		(d,p)
$9/2^-_9$	4174		(d,p), (^{3}He,d)
$9/2^-_{10}$	4214		(d,p), (^{3}He,d)
$9/2^-_{11}$	4336		(^{3}He,d)
$9/2^-_{12}$	4451		(^{3}He,d)
$9/2^-_{13}$	4552		(^{3}He,d)
$1/2^+_3$	4609		(d,p)
$9/2^-_{14}$	4742		(d,p), (^{3}He,d)
$9/2^-_{15}$	4939		(^{3}He,d)
$9/2^-_{16}$	5053		(^{3}He,d)
$1/2^+_4$	5113		(d,p)
$9/2^-_{17}$	5155		(^{3}He,d)
$9/2^-_{18}$	5203		(^{3}He,d)
$9/2^-_{19}$	5230		(^{3}He,d)
$9/2^-_{20}$	5344		(^{3}He,d)
$9/2^-_{21}$	5560		(^{3}He,d)
$9/2^-_{22}$	5964		(^{3}He,d)
$1/2^+_5$	5991		(d,p)
$1/2^+_6$	6184		(d,p)
$1/2^+_7$	6254		(d,p)
$1/2^+_8$	6360		(d,p)
$1/2^+_9$	6438		(d,p)
$7/2^-_5$	6611		(p,n), (^{3}He,α), (^{3}He,t)
$1/2^+_{10}$	7018		(d,p)
$1/2^+_{11}$	7302		(d,p), (^{3}He,α)
$1/2^+_{12}$	7342		(d,p)
$1/2^+_{13}$	7590		(d,p)
$1/2^+_{14}$	7670		(d,p), (^{3}He,α)
$1/2^+_{15}$	7901		(d,p)
$1/2^+_{16}$	7954		(d,p)
$1/2^+_{17}$	8003		(d,p)
$1/2^+_{18}$	8047		(d,p)
$1/2^+_{19}$	8078		(d,p)
$1/2^+_{20}$	8480		(^{3}He,α)

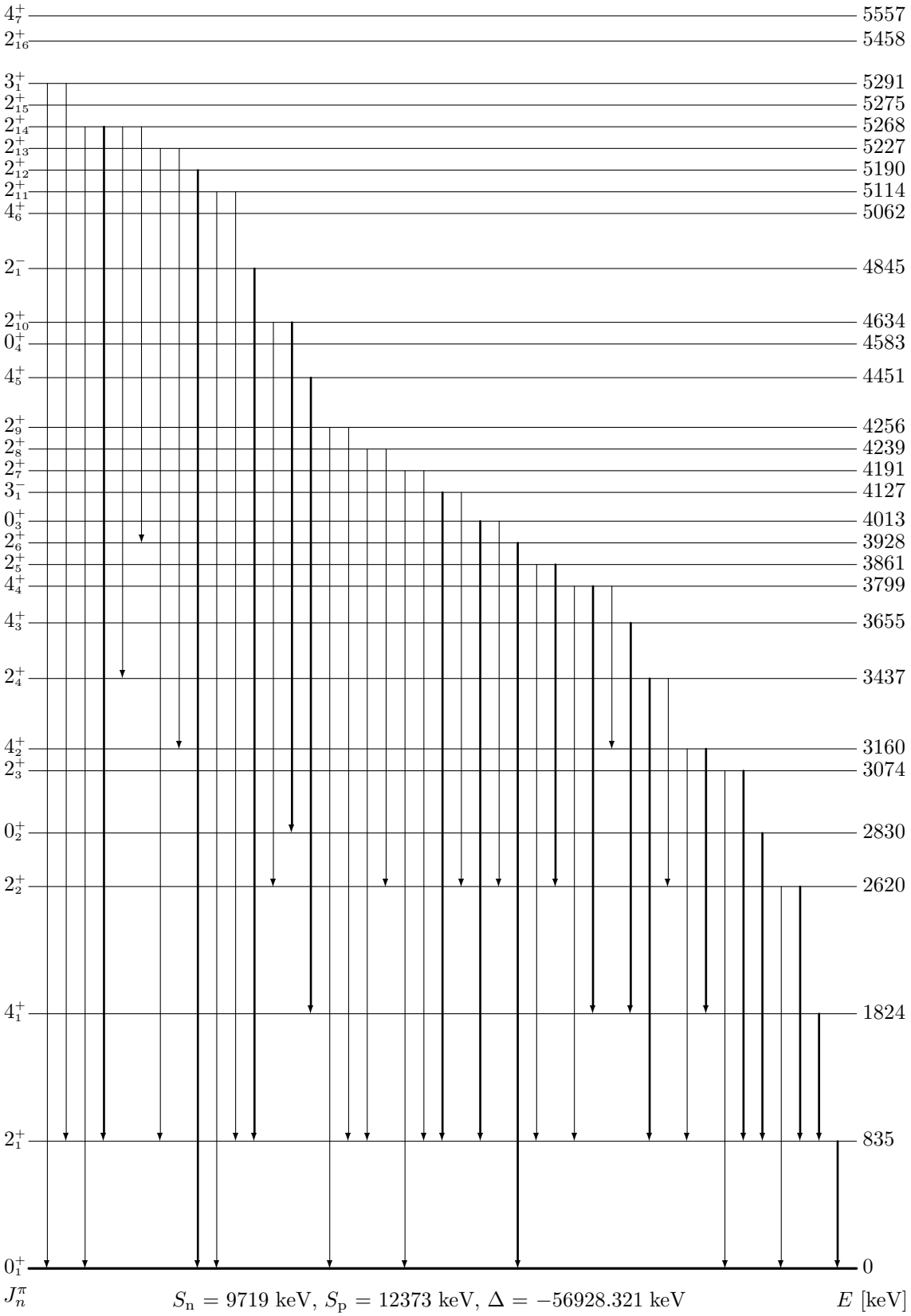


J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [94J, 98B]
0^+_1	0	stable	
2^+_1	1434	0.71 ps	B(E2→ 0^+_1) = 11.4 W.u., log ft = 5.00 (β^- from 3^+), log ft = 5.32 (β^+ from 2^+), Q = −0.14 barn, μ = 3.0 μ_n, (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (p,d), (d,t), (t,p), (p,t), (^{3}He,d)
4^+_1	2370	1.04 ps	B(E2→ 2^+_1) = 66 W.u., log ft = 7.45 (β^- from 3^+), (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (p,d), (d,t), (p,t), (^{3}He,d)
0^+_2	2647		(e,e′), (p,p′), (α,α'), (p,d), (d,t), (t,p), (p,t)
4^+_2	2768	1.9 ps	B(E2→ 2^+_1) = 6.0 W.u., log ft = 5.91 (β^- from 3^+), (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (p,d), (d,t), (p,t), (^{3}He,d)

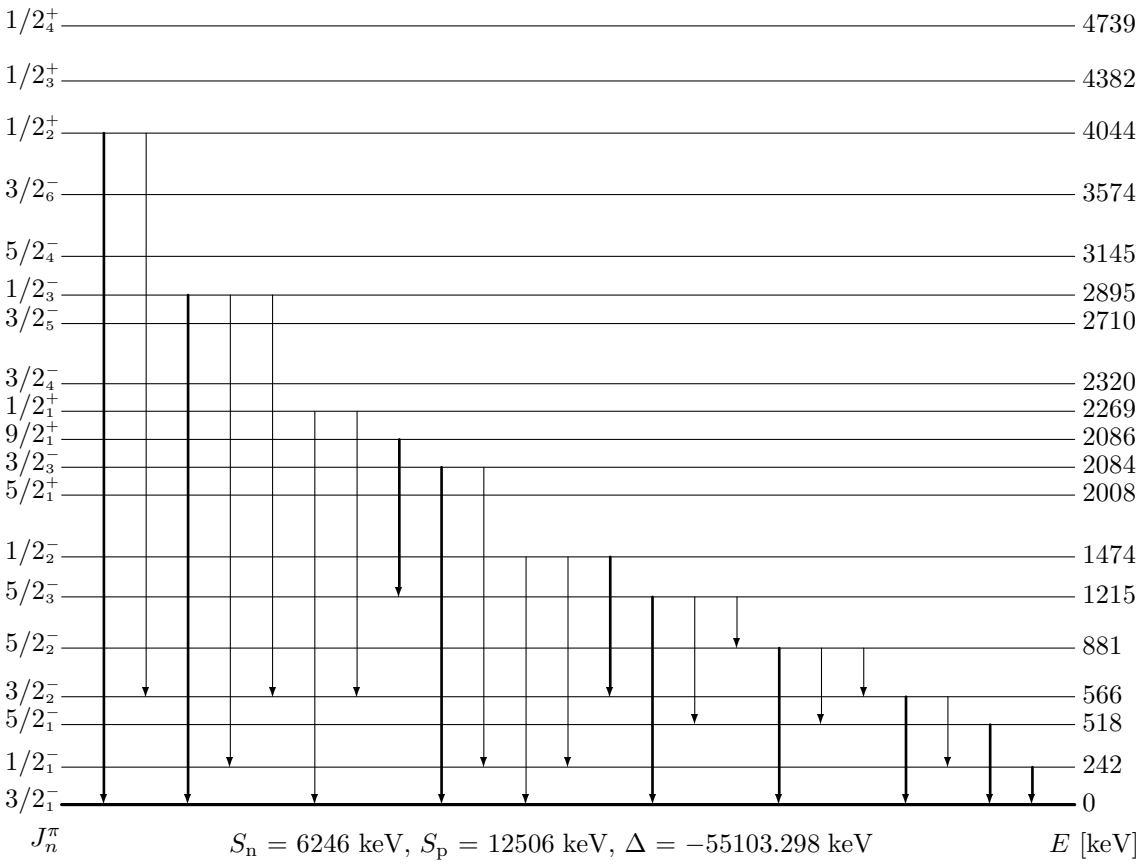
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [94J, 98B]
2_2^+	2965	0.42 ps	B(M1/E2→ 2_1^+) = 0.00036/13 W.u. ($\delta = -6.25$), B(E2→ 0_1^+) = 0.005 W.u., log ft = 6.30 (β^- from 3^+), log ft = 7.08 (β^+ from 2^+), (e,e′), (p,p′), (d,d′), (p,γ), (p,d), (t,p), (^{3}He,d)
6_1^+	3114	41.4 ps	B(E2→ 4_2^+) = 2.58 W.u., B(E2→ 4_1^+) = 5.14 W.u., log ft = 5.58 (β^+ from 6^+), (e,e′), (p,p′), (α,α'), (p,γ), (p,d), (^{3}He,d)
2_3^+	3162	0.066 ps	B(M1/E2→ 2_1^+) = 0.057/1.3 W.u. ($\delta = -0.18$), (e,e′), B(E2→ 0_1^+) = 0.21 W.u., log ft = 7.11 (β^- from 3^+), log ft = 6.08 (β^+ from 2^+), (p,p′), (α,α'), (p,γ), (p,d), (t,p), (p,t)
4_3^+	3415	0.32 ps	B(M1/E2→ 4_2^+) = 0.20/ < 60 W.u. ($\delta = -0.1$), log ft = 5.94 (β^- from 3^+), (p,p′), (p,γ), (p,d), (^{3}He,d)
3_1^+	3472	7.2 ps	B(M1/E2→ 4_2^+) = 0.007/0.6 W.u. ($\delta = 0.14$), log ft = 6.95 (β^- from 3^+), log ft = 6.43 (β^+ from 2^+), (p,p′), (α,α'), (p,γ), (p,d), (d,t)
5_1^+	3616		log ft = 6.15 (β^+ from 6^+), (p,p′), (p,γ), (p,d), (^{3}He,d)
2_4^+	3772	11 fs	B(M1/E2→ 2_1^+) = 0.12/2.0 W.u. ($\delta = -0.20$), B(E2→ 0_1^+) = 1.2 W.u., log ft = 5.53 (β^- from 3^+), log ft = 6.70 (β^+ from 2^+), (e,e′), (p,p′), (α,α'), (p,d), (d,t), (t,p), (^{3}He,d)
5_2^+	4016	0.61 ps	log ft = 6.63 (β^+ from 6^+), (p,p′), (α,α'), (p,γ), (^{3}He,d)
4_4^+	4039	26 fs	(e,e′), (p,p′), (p,γ), (p,d), (^{3}He,d)
3_1^-	4100		(d,t)
3_2^-	4470		
3_3^-	4563	40 fs	log ft = 7.90 (β^+ from 2^+), (e,e′), (p,p′), (α,α'), (t,p), (^{3}He,d)
4_5^+	4627		log ft = 7.32 (β^+ from 6^+), (p,p′), (α,α'), (^{3}He,d)
2_5^+	4702		(p,p′), (^{3}He,d)
4_6^+	4951		(p,p′)
4_7^+	5097		(p,p′), (α,α'), (p,γ), (^{3}He,d)
4_8^+	5346		(p,p′)
4_9^+	5425		(p,p′), (^{3}He,d)
4_{10}^+	5446		(α,α'), (p,γ), (t,p), (^{3}He,d)
3_4^-	5500		(e,e′)
4_{11}^+	5541		(p,p′)
0_3^+	5600		(t,p), (^{3}He,d)
2_6^+	5664		(p,p′), (α,α'), (p,γ), (^{3}He,d)
0_4^+	5755		(t,p), (^{3}He,d)
3_5^-	5873		(p,p′)
2_7^+	5953		(p,p′), (^{3}He,d)
3_6^-	5996		(p,p′), (^{3}He,d)
0_5^+	6106		(p,p′), (^{3}He,d)
2_8^+	6143		(p,p′)
2_9^+	6153		(p,p′), (t,p)
3_7^-	6164		(p,p′), (α,α')
2_{10}^+	6175		(p,p′)
3_8^-	6243		(p,p′)
9_1^+	6452	0.14 ps	
9_2^+	6453	<1.4 ps	
2_{11}^+	6493		(p,p′), (^{3}He,d)
3_9^-	6541		(p,p′), (α,α')
3_{10}^-	6580		(e,e′), (p,p′), (^{3}He,d)



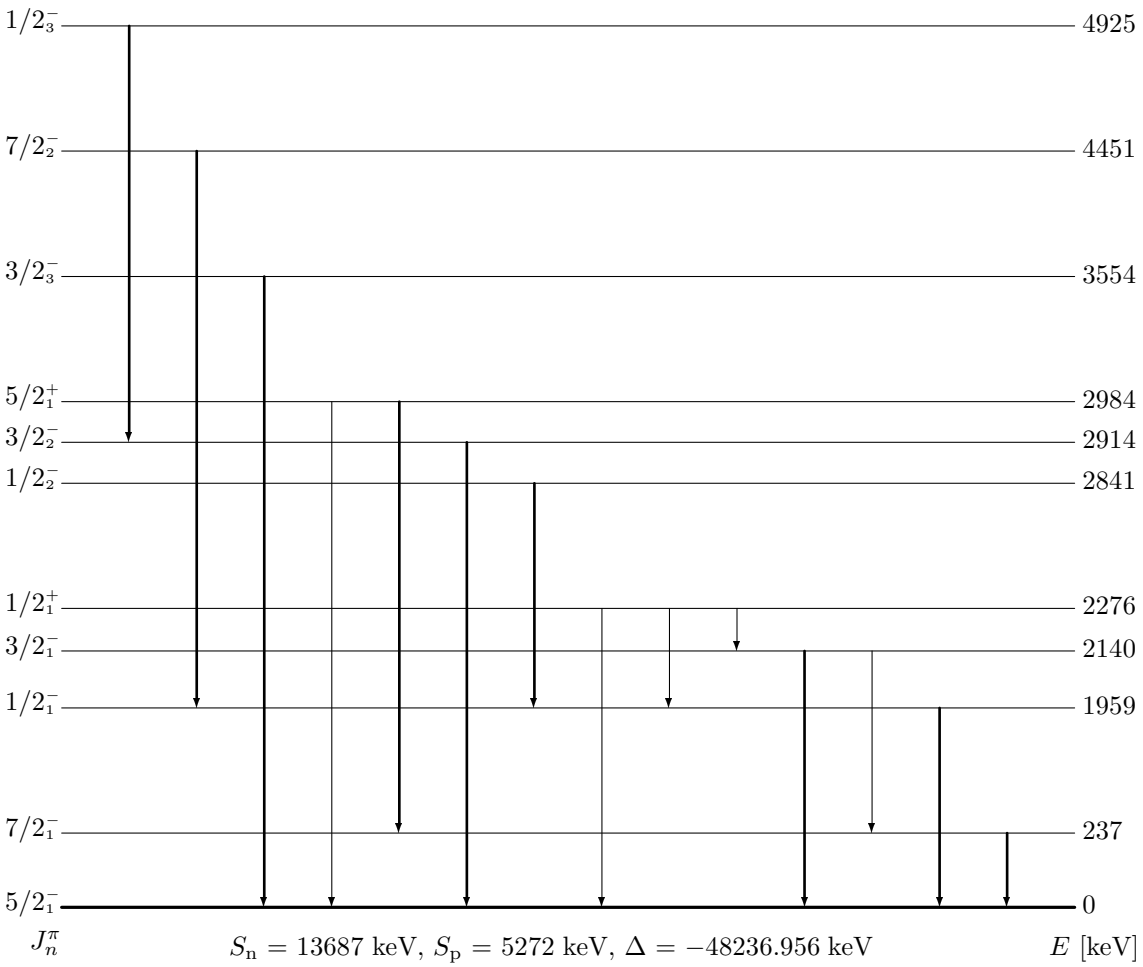
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [90J, 98B]
$3/2_1^-$	0	stable	log ft = 12.90 (β^+ from $7/2^-$), Q = −0.15 barn, μ = −0.47454 μ_n
$1/2_1^-$	564	0.51 ps	Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (d,t), (p,d), (d,p)
$5/2_1^-$	1006	7.1 ps	B(M1/E2→ $3/2_1^-$) = 0.052/14.3 W.u. (δ = 0.36), log ft = 4.60 (β^- from $7/2^-$), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (d,t), (p,d), (d,p)
$7/2_1^-$	1290	1.17 ps	B(M1/E2→ $5/2_1^-$) = 0.046/6.4 W.u. (δ = 0.072), B(E2→ $3/2_1^-$) = 10.5 W.u., log ft = 5.30 (β^- from $7/2^-$), μ = 2.8 μ_n, Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (d,t), (p,d), (d,p)
$7/2_2^-$	1537	23.0 ps	B(M1→ $7/2_1^-$) = 0.0165 W.u., B(E2→ $3/2_1^-$) = 0.022 W.u., B(M1/E2→ $5/2_1^-$) = 0.0042/0.16 W.u. (δ = −0.07), log ft = 6.50 (β^- from $7/2^-$), Coul. ex., (p,p′), (d,d′), (α,α'), (d,t), (p,d), (d,p)
$5/2_2^-$	1974	0.39 ps	B(M1/E2→ $7/2_1^-$) = 0.15/4. · 10^1 W.u. (δ = 0.23), B(M1/E2→ $3/2_1^-$) = 0.028/3.6 W.u. (δ = 0.48), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (p,d), (d,p)
$11/2_1^-$	2172	9.6 ps	B(E2→ $7/2_1^-$) = 9.3 W.u., (p,p′), (α,α'), (d,p)
$9/2_1^-$	2233	0.36 ps	B(M1/E2→ $7/2_2^-$) = 0.176/23 W.u. (δ = −0.17), Coul. ex., (p,p′), (d,p)
$3/2_2^-$	2321	0.8 fs	B(M1/E2→ $3/2_1^-$) = 2/11 W.u. (δ = −0.11), Coul. ex., (p,p′), (p,d), (d,p)
$1/2_2^-$	2670		(p,p′), (d,p)
$11/2_2^-$	2706	2.4 ps	B(M1/E2→ $11/2_1^-$) = 0.030/2.3 · 10^2 W.u., (p,d)
$3/2_3^-$	2709		(p,p′), (d,p)
$11/2_3^-$	2827	0.11 ps	B(M1/E2→ $9/2_1^-$) = 0.9/7. · 10^1 W.u. (δ = −0.11), (p,p′)
$15/2_1^-$	3084	30 ps	B(E2→ $11/2_2^-$) = 1.4 W.u., B(E2→ $11/2_1^-$) = 2.5 W.u., (p,p′)
$7/2_3^-$	3382		
$13/2_1^-$	3592	0.13 ps	B(M1/E2→ $11/2_3^-$) = 0.37/27 W.u. (δ = −0.14), (p,p′)
$1/2_3^-$	3617		(p,p′), (d,p)


4^+_7 5557
2^+_{16} 5458
3^+_1 5291
2^+_{15} 5275
2^+_{14} 5268
2^+_{13} 5227
2^+_{12} 5190
2^+_{11} 5114
4^+_6 5062
2^-_1 4845
2^+_{10} 4634
0^+_4 4583
4^+_5 4451
2^+_9 4256
2^+_8 4239
2^+_7 4191
3^-_1 4127
0^+_3 4013
2^+_6 3928
2^+_5 3861
4^+_4 3799
4^+_3 3655
2^+_4 3437
4^+_2 3160
2^+_3 3074
0^+_2 2830
2^+_2 2620
4^+_1 1824
2^+_1 835
0^+_1 0
J^π_n
S_n = 9719 keV, S_p = 12373 keV, Δ = −56928.321 keV
E [keV]

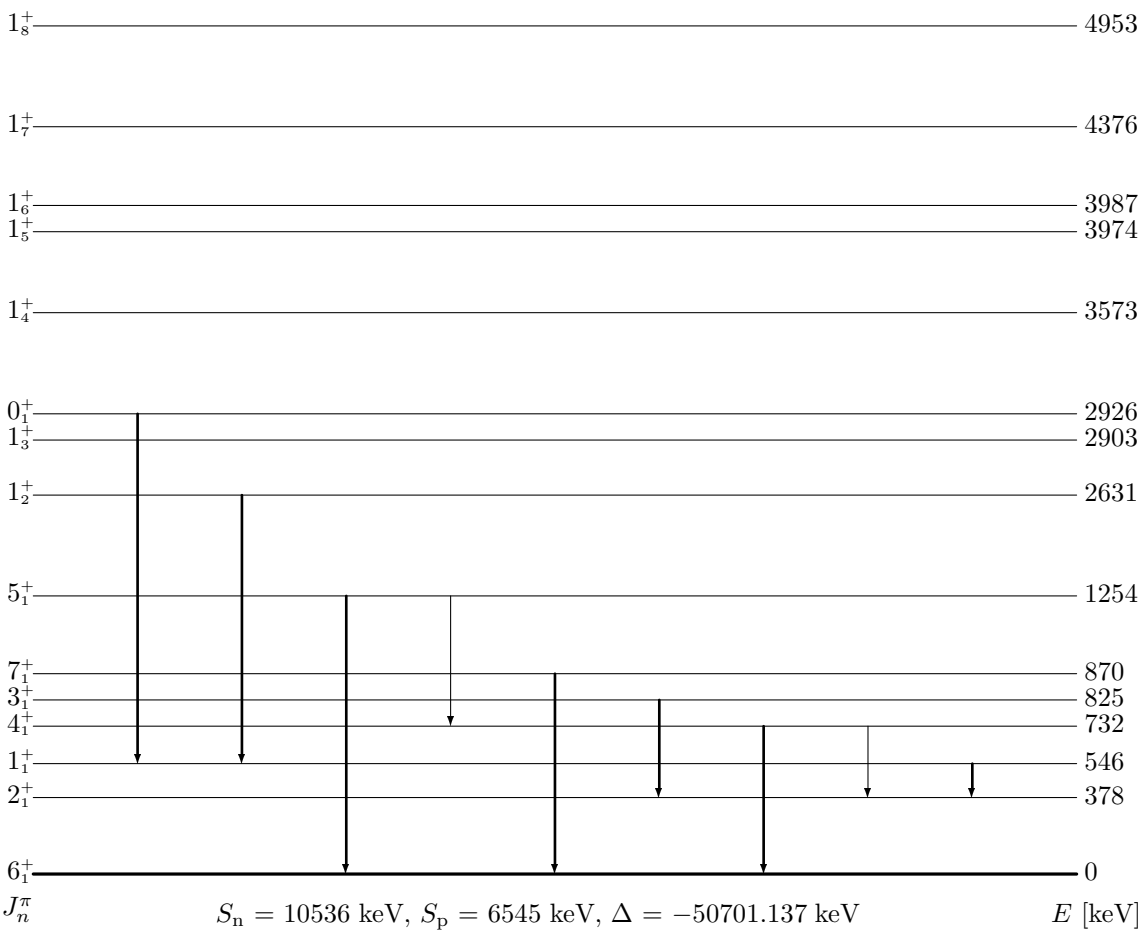
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93J, 98B]
0_1^+	0	stable	log ft < 14.10 (β^+ from 3^+), Coul. ex., (p,p′), (d,d′), (α,α'), (d,p), (d,^{3}He), (t,p)
2_1^+	835	7.9 ps	B(E2→ 0_1^+) = 14.6 W.u., log ft = 6.20 (β^+ from 3^+), Q = −0.21 barn, μ = 1.10 μ_n
4_1^+	1824	1.7 ps	B(E2→ 2_1^+) = 29 W.u., log ft = 7.10 (β^- from 3^+), Coul. ex., (p,p′), (d,p), (d,^{3}He), (t,p)
2_2^+	2620	78 fs	B(M1/E2→ 2_1^+) = 0.026/5 W.u. (δ = −0.53), B(E2→ 0_1^+) = 0.9 W.u., log ft = 7.00 (β^- from 3^+), (p,p′), (d,d′), (d,p), (t,p)
0_2^+	2830	0.15 ps	B(E2→ 2_1^+) = 10 W.u., (p,p′), (d,p), (t,p)
2_3^+	3074	7.1 fs	B(M1/E2→ 2_1^+) = 0.216/ < 0.23 W.u. (δ = 0.02), log ft = 7.40 (β^- from 3^+), (p,p′), (d,p), (t,p)
4_2^+	3160	0.24 ps	(p,p′), (d,p), (t,p)
2_4^+	3437	8 fs	B(M1/E2→ 2_1^+) = 0.028/ < 0.35 W.u. (δ = −0.11), log ft = 6.90 (β^- from 3^+), (p,p′), (d,p), (t,p)
4_3^+	3655	6 fs	B(M1→ 4_1^+) > 0.60 W.u., log ft = 6.20 (β^- from 3^+), (p,p′), (d,p), (t,p)
4_4^+	3799	51 fs	log ft = 5.74 (β^- from 3^+), (p,p′), (d,p), (t,p)
2_5^+	3861		(p,p′), (d,p), (t,p)
2_6^+	3928		(p,p′), (d,p), (t,p)
0_3^+	4013	1.4 fs	(p,p′), (d,p), (t,p)
3_1^-	4127		(p,p′), (d,p), (t,p)
2_7^+	4191		(p,p′), (d,p), (t,p)
2_8^+	4239		(p,p′), (d,p), (t,p)
2_9^+	4256		(p,p′), (d,p), (t,p)
4_5^+	4451		log ft = 6.17 (β^- from 3^+), (p,p′), (t,p)
0_4^+	4583		(p,p′), (t,p)
2_{10}^+	4634		(p,p′), (d,p), (t,p)
2_1^-	4845		(p,p′), (d,p)
4_6^+	5062		(p,p′), (t,p)
2_{11}^+	5114		(p,p′), (d,p), (t,p)
2_{12}^+	5190		(p,p′), (d,p), (t,p)
2_{13}^+	5227		(p,p′), (d,p)
2_{14}^+	5268		(p,p′)
2_{15}^+	5275		(p,p′), (d,p), (t,p)
3_1^+	5291		(p,p′)
2_{16}^+	5458		(d,p), (t,p)
4_7^+	5557		(d,p), (t,p)



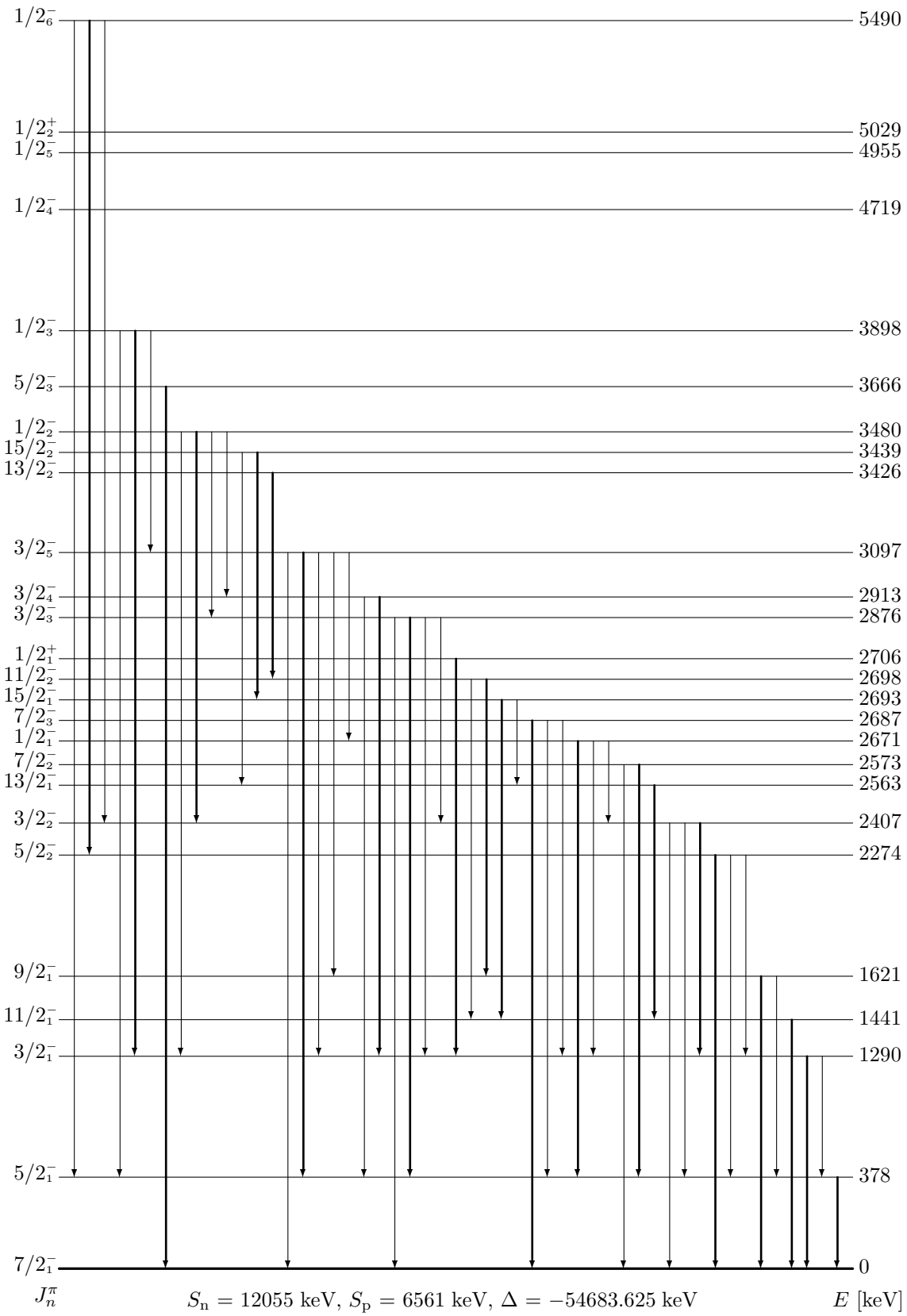
J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [91J, 98B]
$3/2^-_1$	0	3.497 m	(d,p), (t,p)
$1/2^-_1$	242		log ft = 7.10 (β^- from $(7/2)^-$), (d,p), (t,p)
$5/2^-_1$	518	<5.2 ps	log ft = 5.12 (β^- from $(7/2)^-$), (d,p), (t,p)
$3/2^-_2$	566		log ft = 6.36 (β^- from $(7/2)^-$), (d,p), (t,p)
$5/2^-_2$	881		log ft = 5.50 (β^- from $(7/2)^-$), (d,p), (t,p)
$5/2^-_3$	1215	3.5 ps	(d,p)
$1/2^-_2$	1474		(d,p), (t,p)
$5/2^+_1$	2008		(d,p), (t,p)
$3/2^-_3$	2084		(t,p)
$9/2^+_1$	2086		(d,p), (t,p)
$1/2^+_1$	2269		(d,p)
$3/2^-_4$	2320		(d,p), (t,p)
$3/2^-_5$	2710		(d,p), (t,p)
$1/2^-_3$	2895		(d,p), (t,p)
$5/2^-_4$	3145		(d,p)
$3/2^-_6$	3574		(d,p), (t,p)
$1/2^+_2$	4044		(d,p)
$1/2^+_3$	4382		(d,p)
$1/2^+_4$	4739		(d,p)



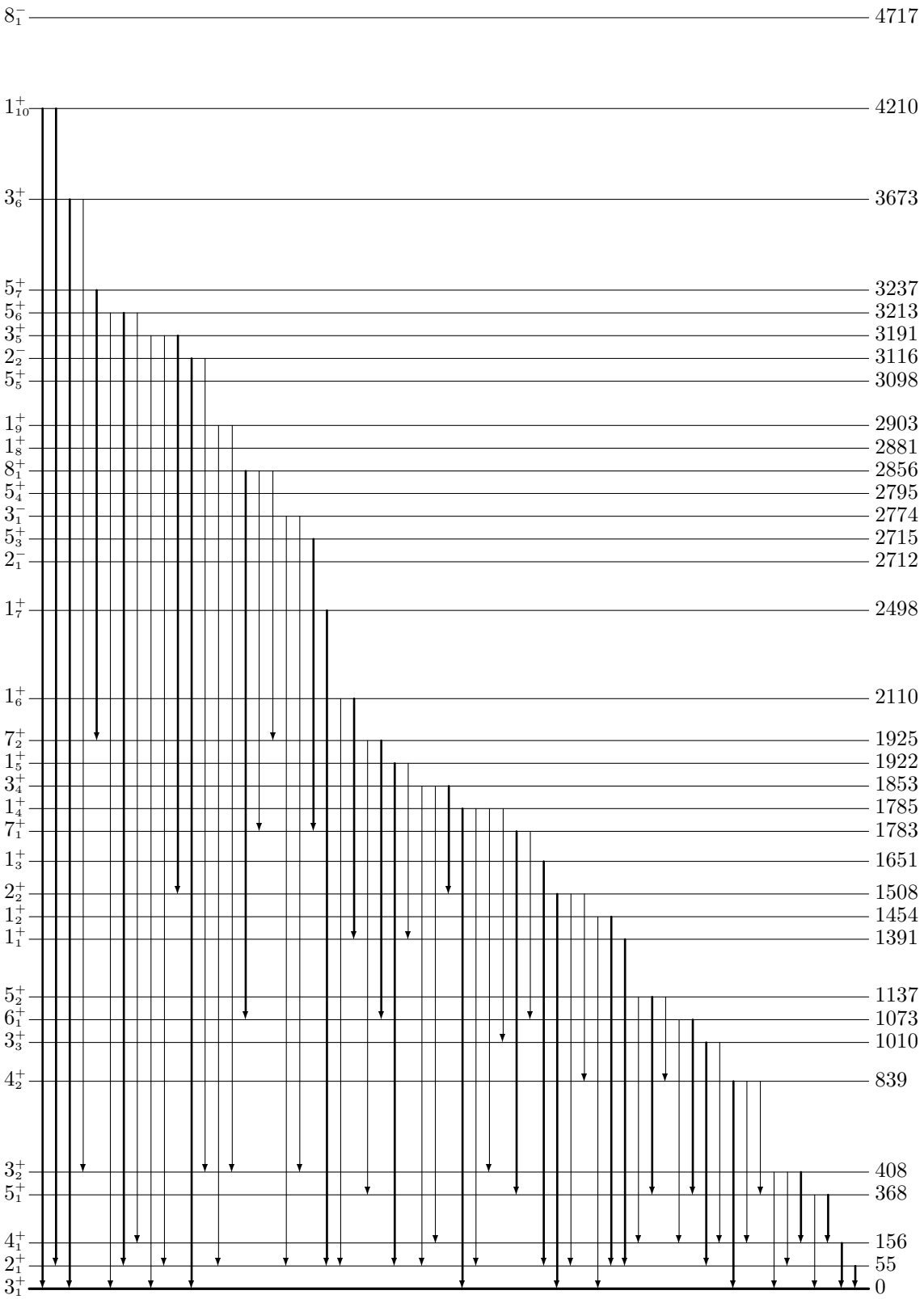
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [97C, 98B]
$5/2_1^-$	0	46.2 m	log ft = 3.65 (β^+ from $(5/2)^-$), (d,n), (^{3}He,d), Q = 0.42 barn, μ = 3.5683 μ_n
$7/2_1^-$	237	14.1 ps	B(M1/E2→ $5/2_1^-$) = 0.116/47 W.u. (δ = 0.100), log ft = 4.86 (β^+ from $(5/2)^-$), (^{3}He,d)
$1/2_1^-$	1959	0.38 ps	(d,n), (^{3}He,d)
$3/2_1^-$	2140	15 fs	log ft = 5.51 (β^+ from $(5/2)^-$), (^{3}He,d)
$1/2_1^+$	2276	>1.2 fs	(^{3}He,d)
$1/2_2^-$	2841	0.27 ps	(^{3}He,d)
$3/2_2^-$	2914	<21 fs	log ft = 5.54 (β^+ from $(5/2)^-$), (^{3}He,d)
$5/2_1^+$	2984		(^{3}He,d)
$3/2_3^-$	3554		(^{3}He,d)
$7/2_2^-$	4451		(^{3}He,d)
$1/2_3^-$	4925		(^{3}He,d)
$3/2_4^-$	6304		
$3/2_5^-$	6451		
$5/2_2^-$	6754		



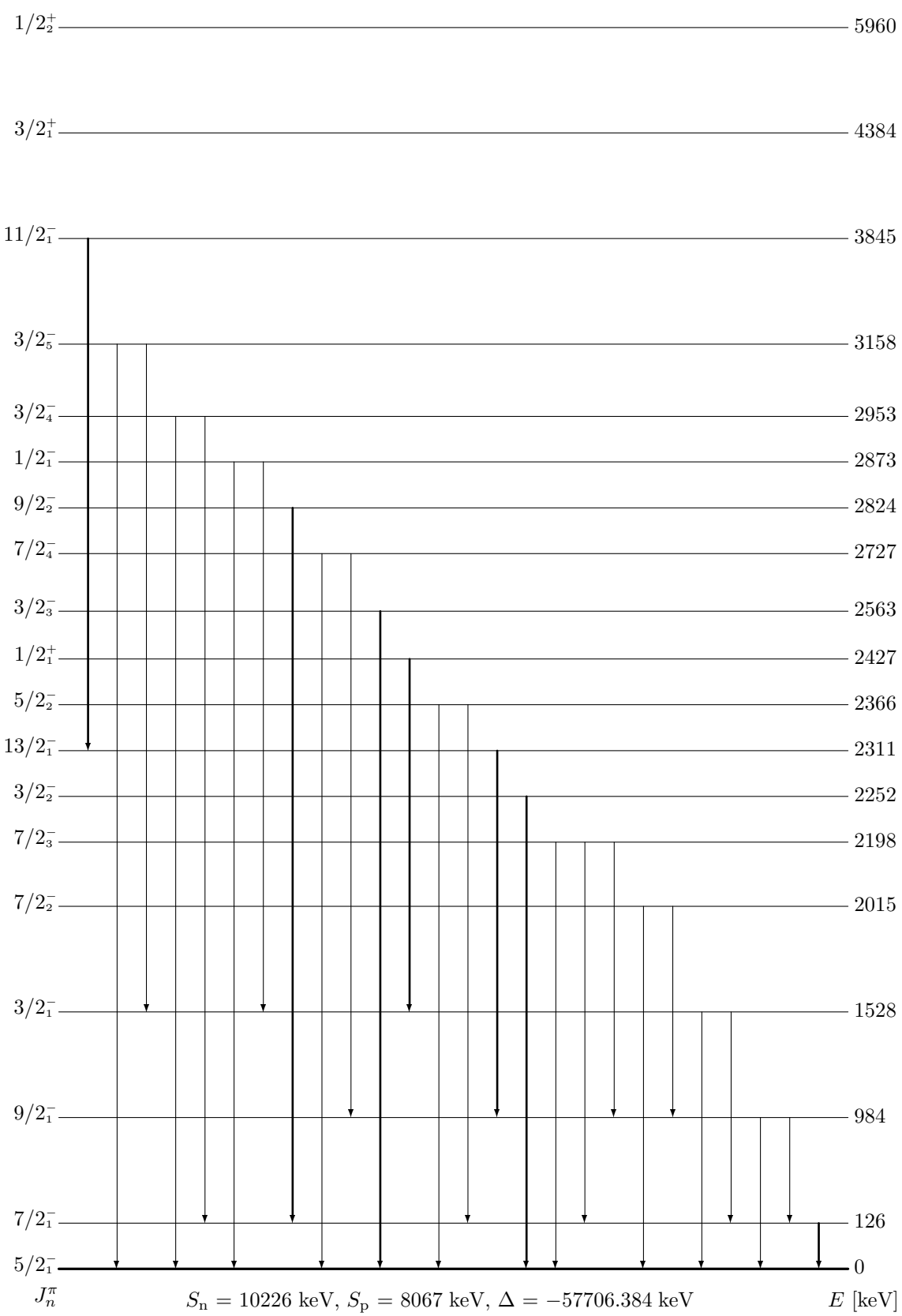
J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [94J, 98B]
6^+_1	0	5.591 d	Q = 0.50 barn, μ = 3.063 μ_n
2^+_1	378	21.1 m	B(E4→ 6^+_1) = 0.146 W.u., μ = 0.00768 μ_n, (p,n), (^{3}He,t), (^{3}He,p), (p,^{3}He), (d,α)
1^+_1	546	<0.5 ns	log ft = 4.70 (β^+ from 0^+), (p,n), (^{3}He,t), (^{3}He,p), (α,d), (p,^{3}He), (d,α)
4^+_1	732	3.6 ps	B(E2→ 2^+_1) = 195 W.u., B(E2→ 6^+_1) = 60 W.u., (^{3}He,t), (p,^{3}He), (d,α)
3^+_1	825	0.17 ps	(^{3}He,t), (^{3}He,p), (p,^{3}He), (d,α)
7^+_1	870	0.12 ps	B(M1/E2→ 6^+_1) = 0.28/8 W.u. (δ = −0.10), (^{3}He,t), (^{3}He,p), (p,^{3}He), (d,α)
5^+_1	1254	0.018 ps	(^{3}He,t), (^{3}He,p), (α,d), (p,^{3}He), (d,α)
1^+_2	2631		(^{3}He,t), (^{3}He,p), (α,d), (p,^{3}He), (d,α)
1^+_3	2903		(^{3}He,t), (^{3}He,p), (α,d), (d,α)
0^+_1	2926		(p,n), (^{3}He,t), (^{3}He,p), (p,^{3}He)
1^+_4	3573		(^{3}He,t), (^{3}He,p), (p,^{3}He), (d,α)
1^+_5	3974		(^{3}He,p), (d,α)
1^+_6	3987		(d,α)
1^+_7	4376		(^{3}He,p), (d,α)
1^+_8	4953		(^{3}He,p)


1/2⁻₆ 5490
1/2⁺₂ 5029
1/2⁻₅ 4955
1/2⁻₄ 4719
1/2⁻₃ 3898
5/2⁻₃ 3666
1/2⁻₂ 3480
15/2⁻₂ 3439
13/2⁻₂ 3426
3/2⁻₅ 3097
3/2⁻₄ 2913
3/2⁻₃ 2876
1/2⁺₁ 2706
11/2⁻₂ 2698
15/2⁻₁ 2693
7/2⁻₃ 2687
1/2⁻₁ 2671
7/2⁻₂ 2573
13/2⁻₁ 2563
3/2⁻₂ 2407
5/2⁻₂ 2274
9/2⁻₁ 1621
11/2⁻₁ 1441
3/2⁻₁ 1290
5/2⁻₁ 378
7/2⁻₁ 0
J^π_n
S_n = 12055 keV, S_p = 6561 keV, Δ = −54683.625 keV
E [keV]

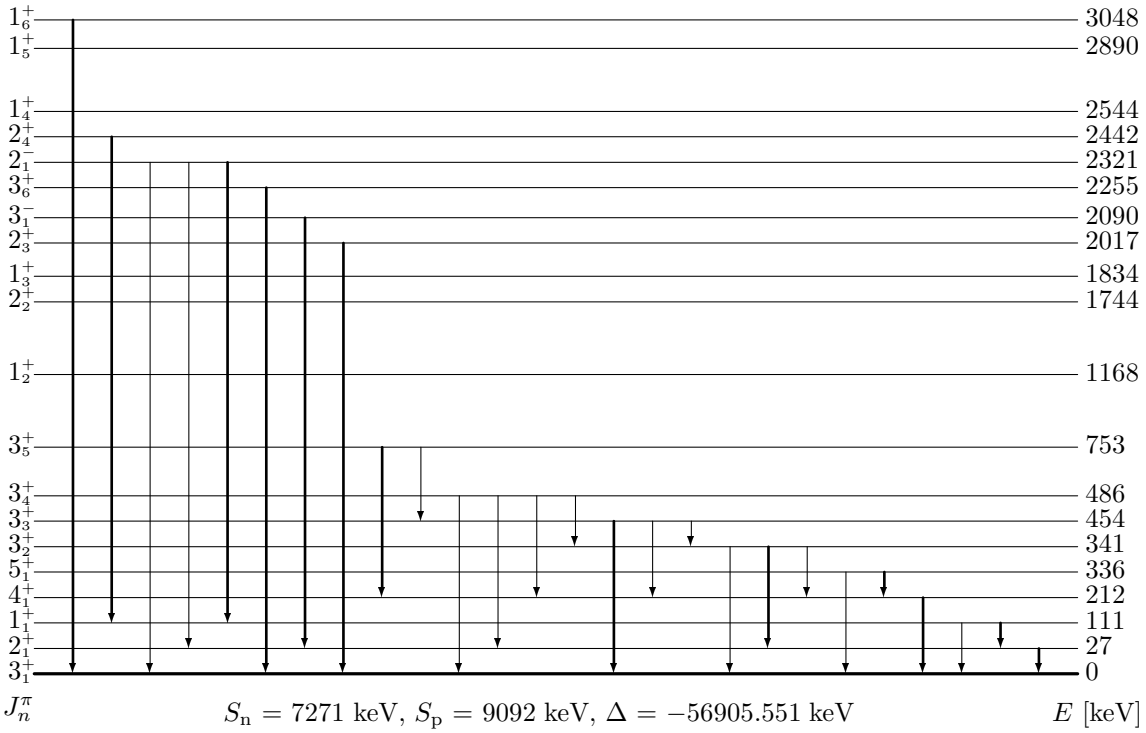
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [90J, 98B]
$7/2_1^-$	0	$3.74{\cdot}10^6$ y	log $ft = 5.19$ (β^+ from $7/2^-$), $\mu = 5.024\ \mu_n$
$5/2_1^-$	378	117 ps	B(M1/E2$\rightarrow 7/2_1^-$) = 0.00254/14 W.u. ($\delta = 0.61$), log $ft = 5.09$ (β^+ from $7/2^-$), $\mu = 3.25\ \mu_n$, (p,n), (d,n), (d,^{3}He), (^{3}He,d), (p,t)
$3/2_1^-$	1290	0.55 ps	B(M1/E2$\rightarrow 5/2_1^-$) = 0.023/1.9 W.u. ($\delta = 0.18$), B(E2$\rightarrow 7/2_1^-$) = 13.4 W.u., (p,n), (d,n), (d,^{3}He), (^{3}He,d)
$11/2_1^-$	1441	0.60 ps	B(E2$\rightarrow 7/2_1^-$) = 12.8 W.u., (p,n)
$9/2_1^-$	1621	0.48 ps	B(E2$\rightarrow 5/2_1^-$) = 3.7 W.u., B(M1/E2$\rightarrow 7/2_1^-$) = 0.0012/7.0 W.u. ($\delta = 2.7$), log $ft = 5.60$ (β^+ from $7/2^-$), (p,n), (d,^{3}He), (p,t)
$5/2_2^-$	2274	0.25 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.0021/3.0 W.u. ($\delta = 0.8$), B(M1/E2$\rightarrow 5/2_1^-$) = 0.0019/0.61 W.u. ($\delta = -0.74$), B(M1/E2$\rightarrow 7/2_1^-$) = 0.0054/0.07 W.u. ($\delta = 0.17$), log $ft = 4.90$ (β^+ from $7/2^-$), (p,n), (p,t)
$3/2_2^-$	2407	0.11 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.064/1.9 W.u. ($\delta = 0.13$), B(M1/E2$\rightarrow 5/2_1^-$) $> 0.0038/ < 0.43$ W.u. ($\delta = -0.4$), B(E2$\rightarrow 7/2_1^-$) = 2.0 W.u., (p,n), (d,n), (d,^{3}He), (^{3}He,d)
$13/2_1^-$	2563	10.7 ps	B(M1$\rightarrow 11/2_1^-$) = 0.00146 W.u.
$7/2_2^-$	2573	0.06 ps	(p,n), (d,n), (d,^{3}He), (p,t)
$1/2_1^-$	2671	21 fs	B(E2$\rightarrow 5/2_1^-$) = 15 W.u., (p,n), (^{3}He,d)
$7/2_3^-$	2687	0.05 ps	B(M1$\rightarrow 5/2_1^-$) = 0.004 W.u., B(M1/E2$\rightarrow 7/2_1^-$) = 0.010/2.4 W.u. ($\delta = -0.9$), log $ft = 5.10$ (β^+ from $7/2^-$), (p,n), (p,t)
$15/2_1^-$	2693	2.7 ps	B(M1$\rightarrow 13/2_1^-$) = 0.21 W.u., B(E2$\rightarrow 11/2_1^-$) = 5.4 W.u.
$11/2_2^-$	2698		
$1/2_1^+$	2706	0.8 ps	B(E1$\rightarrow 3/2_1^-$) = $2.1 \cdot 10^{-4}$ W.u., (p,n), (d,^{3}He), (^{3}He,d)
$3/2_3^-$	2876	41 ps	B(M1$\rightarrow 5/2_1^-$) = $2.5 \cdot 10^{-5}$ W.u., B(E2$\rightarrow 7/2_1^-$) = 0.0008 W.u., (p,n), (^{3}He,d)
$3/2_4^-$	2913	58 fs	(p,n), (d,n), (d,^{3}He)
$3/2_5^-$	3097	0.074 ps	(p,n), (^{3}He,d)
$13/2_2^-$	3426	0.7 ps	B(M1/E2$\rightarrow 11/2_2^-$) = $0.04/1.6 \cdot 10^2$ W.u. ($\delta = -0.98$), (p,t)
$15/2_2^-$	3439	0.14 ps	B(M1/E2$\rightarrow 15/2_1^-$) = $0.23/2. \cdot 10^1$ W.u. ($\delta = 0.15$)
$1/2_2^-$	3480		(p,n), (d,n), (d,^{3}He), (^{3}He,d)
$5/2_3^-$	3666		(p,n), (d,^{3}He), (^{3}He,d)
$1/2_3^-$	3898		(p,n), (d,n), (^{3}He,d)
$1/2_4^-$	4719		(d,n), (^{3}He,d)
$1/2_5^-$	4955		(d,n), (^{3}He,d)
$1/2_2^+$	5029		(d,^{3}He)
$1/2_6^-$	5490		(^{3}He,d)
$3/2_6^-$	6977		(^{3}He,d)
$1/2_7^-$	7548		(^{3}He,d)
$5/2_4^-$	7923		
$5/2_5^-$	7930		(^{3}He,d)
$5/2_6^-$	8030		(^{3}He,d)
$5/2_7^-$	8050		(^{3}He,d)
$5/2_8^-$	8264		
$3/2_7^-$	8295		
$3/2_8^-$	8427		(^{3}He,d)
$7/2_4^-$	8516		(^{3}He,d)


8_1^- 4717
1_{10}^+ 4210
3_6^+ 3673
5_7^+ 3237
5_6^+ 3213
3_5^+ 3191
2_2^- 3116
5_5^+ 3098
1_9^+ 2903
1_8^+ 2881
8_1^+ 2856
5_4^+ 2795
3_1^- 2774
5_3^+ 2715
2_1^- 2712
1_7^+ 2498
1_6^+ 2110
7_2^+ 1925
1_5^+ 1922
3_4^+ 1853
1_4^+ 1785
7_1^+ 1783
1_3^+ 1651
2_2^+ 1508
1_2^+ 1454
1_1^+ 1391
5_2^+ 1137
6_1^+ 1073
3_3^+ 1010
4_2^+ 839
3_2^+ 408
5_1^+ 368
4_1^+ 156
2_1^+ 55
3_1^+ 0
J_n^π
S_n = 8939 keV, S_p = 7560 keV, Δ = −55551.269 keV
E [keV]

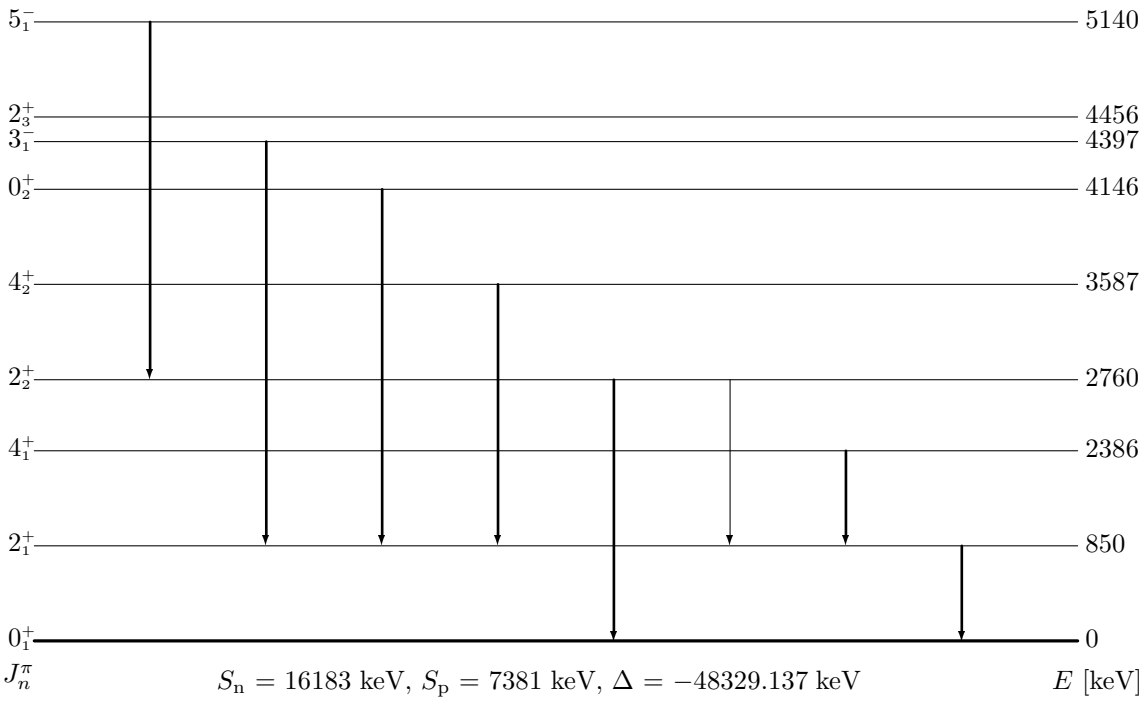
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93J, 98B]
3_1^+	0	312.3 d	$Q = 0.33$ barn, $\mu = 3.2819\ \mu_n$
2_1^+	55	49 ps	$\mu = 3.4\ \mu_n$, (t,^{3}He), (d,t), (^{3}He,d), (d,α), (^{3}He,p)
4_1^+	156	186 ps	B(M1/E2$\rightarrow 3_1^+$) = 0.0307/2.4 W.u. ($\delta = -0.030$), $\mu = 5.1\ \mu_n$
5_1^+	368	6.9 ps	B(M1/E2$\rightarrow 4_1^+$) = 0.33/23 W.u. ($\delta = 0.038$), B(E2$\rightarrow 3_1^+$) = 9.0 W.u.
3_2^+	408	1.8 ps	B(M1/E2$\rightarrow 4_1^+$) = 0.56/10 W.u. ($\delta = 0.023$), B(M1/E2$\rightarrow 2_1^+$) = 0.029/16 W.u. ($\delta = 0.18$), B(M1/E2$\rightarrow 3_1^+$) = 0.065/ $<$ 23 W.u. ($\delta = 0.06$), (t,^{3}He), (d,t), (^{3}He,d), (d,α)
4_2^+	839	0.41 ps	B(M1/E2$\rightarrow 5_1^+$) = 0.18/4 W.u. ($\delta = -0.045$)
3_3^+	1010	44 fs	B(M1/E2$\rightarrow 4_1^+$) = 0.35/1.8 W.u. ($\delta = 0.042$), B(M1/E2$\rightarrow 2_1^+$) = 0.33/1.4 W.u. ($\delta = 0.044$), (t,^{3}He), (d,t), (^{3}He,d), (d,α), (^{3}He,p), (α,d)
6_1^+	1073	220 ps	B(M1/E2$\rightarrow 5_1^+$) = 0.000283/ $<$ 0.0015 W.u. ($\delta = -0.02$), $\mu = 2.8\ \mu_n$, (t,^{3}He), (d,t), (d,α)
5_2^+	1137	0.60 ps	(t,^{3}He), (d,t), (d,α), (^{3}He,p), (α,d)
1_1^+	1391	0.38 ps	B(M1/E2$\rightarrow 2_1^+$) = 0.014/12 W.u. ($\delta = -0.85$), (t,^{3}He), (d,n), (d,t), (d,α)
1_2^+	1454	83 ps	B(M1/E2$\rightarrow 2_1^+$) = 0.045/ $<$ 0.83 W.u. ($\delta = -0.05$), (t,^{3}He), (d,t), (^{3}He,d), (d,α), (^{3}He,p), (α,d)
2_2^+	1508	0.12 ps	B(M1/E2$\rightarrow 2_1^+$) = 0.018/ $<$ 0.6 W.u. ($\delta = 0.01$), B(M1/E2$\rightarrow 3_1^+$) = 0.043/ $<$ 0.023 W.u. ($\delta = -0.008$), (t,^{3}He), (d,t), (^{3}He,d), (d,α), (^{3}He,p)
1_3^+	1651	0.33 ps	(d,t), (^{3}He,p)
7_1^+	1783	0.77 ps	(t,^{3}He), (d,α)
1_4^+	1785	16 fs	(t,^{3}He), (d,t), (^{3}He,d), (^{3}He,p), (α,d)
3_4^+	1853	95 fs	(t,^{3}He), (d,t), (^{3}He,d), (d,α)
1_5^+	1922	29 fs	(t,^{3}He), (d,t), (^{3}He,d), (d,α), (^{3}He,p), (α,d)
7_2^+	1925	0.73 ps	B(M1/E2$\rightarrow 6_1^+$) = 0.040/18 W.u. ($\delta = -0.40$), (t,^{3}He), (d,t), (d,α)
1_6^+	2110	$>$416 fs	(d,t), (^{3}He,d), (d,α), (^{3}He,p)
1_7^+	2498		(t,^{3}He), (d,t), (^{3}He,d), (d,α), (^{3}He,p)
2_1^-	2712		(d,t), (^{3}He,d), (d,α), (α,d)
5_3^+	2715		(t,^{3}He), (α,d)
3_1^-	2774		(^{3}He,d), (d,α)
5_4^+	2795		(t,^{3}He), (d,t)
8_1^+	2856	5.9 ps	B(E2$\rightarrow 6_1^+$) $<$ 0.0006 W.u.
1_8^+	2881		(d,t), (d,t), (^{3}He,d), (^{3}He,p), (α,d)
1_9^+	2903		(t,^{3}He), (d,t), (d,α), (^{3}He,p)
5_5^+	3098		(t,^{3}He), (d,t)
2_2^-	3116		(^{3}He,d), (d,α)
3_5^+	3191		(^{3}He,d), (d,α), (^{3}He,p), (α,d)
5_6^+	3213		(t,^{3}He), (d,t)
5_7^+	3237	0.020 ps	(t,^{3}He), (d,t)
3_6^+	3673		(^{3}He,d), (d,α), (^{3}He,p)
1_{10}^+	4210		(t,^{3}He), (d,t), (d,α), (^{3}He,p)
8_1^-	4717		(d,t), (^{3}He,d), (^{3}He,p), (α,d)
3_7^+	5233		(d,α)
6_1^-	5560		(α,d)
1_{11}^+	5631		(d,α), (^{3}He,p)
1_{12}^+	5656		(d,α), (^{3}He,p)


1/2+2 5960
3/2+1 4384
11/2−1 3845
3/2−5 3158
3/2−4 2953
1/2−1 2873
9/2−2 2824
7/2−4 2727
3/2−3 2563
1/2+1 2427
5/2−2 2366
13/2−1 2311
3/2−2 2252
7/2−3 2198
7/2−2 2015
3/2−1 1528
9/2−1 984
7/2−1 126
5/2−1 0
J^π_n
S_n = 10226 keV, S_p = 8067 keV, Δ = −57706.384 keV
E [keV]

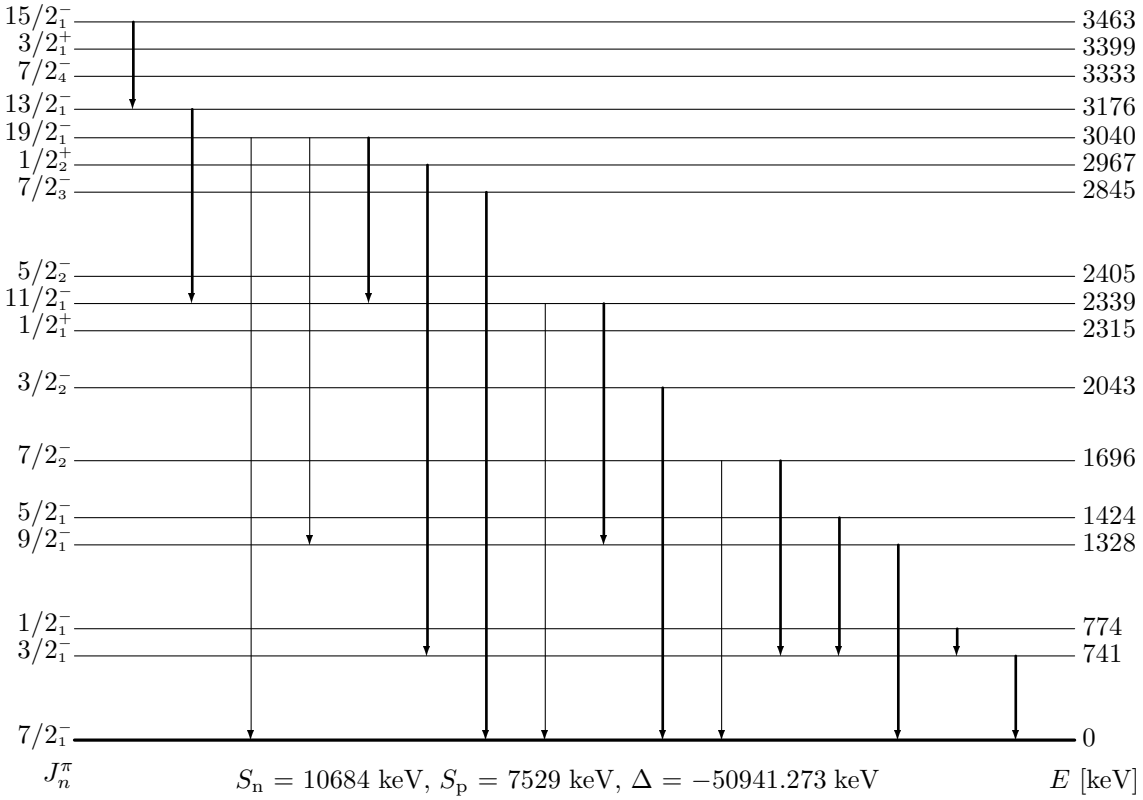
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [91J, 98B]
$5/2_1^-$	0	stable	log $ft = 5.03$ (β^- from $3/2^-$), log $ft = 6.00$ (β^+ from $3/2^-$), $Q = 0.33$ barn, $\mu = 3.4532$ μ_n
$7/2_1^-$	126	259 ps	B(M1/E2$\rightarrow 5/2_1^-$) = 0.0417/14.7 W.u. ($\delta = 0.052$), log $ft = 14.15$ (β^+ from $3/2^-$), $\mu = 4.4$ μ_n, (γ,γ'), Coul. ex., (p,p′), (α,α'), (p,γ), (d,n), (d,^{3}He), (^{3}He,d), (p,^{3}He), (d,α)
$9/2_1^-$	984	0.28 ps	B(M1/E2$\rightarrow 7/2_1^-$) = 0.110/23 W.u. ($\delta = 0.27$), B(E2$\rightarrow 5/2_1^-$) = 8.8 W.u., (γ,γ'), Coul. ex., (e,e′), (p,p′), (α,α'), (p,γ), (d,^{3}He), (^{3}He,d), (p,^{3}He), (d,α)
$3/2_1^-$	1528	62 fs	B(M1/E2$\rightarrow 5/2_1^-$) = 0.092/3.3 W.u. ($\delta = 0.20$), log $ft = 6.88$ (β^- from $3/2^-$), (γ,γ'), Coul. ex., (e,e′), (p,p′), (α,α'), (p,γ), (d,^{3}He), (^{3}He,d), (p,^{3}He), (d,α)
$7/2_2^-$	2015	0.51 fs	B(M1/E2$\rightarrow 5/2_1^-$) = 0.416/3.0 W.u. ($\delta = 0.12$), Coul. ex.
$7/2_3^-$	2198	18 fs	B(M1/E2$\rightarrow 9/2_1^-$) = 0.22/10 W.u. ($\delta = 0.18$), B(M1/E2$\rightarrow 5/2_1^-$) = 0.065/2.0 W.u. ($\delta = 0.27$), (γ,γ'), Coul. ex., (p,p′), (p,γ), (d,^{3}He), (^{3}He,d)
$3/2_2^-$	2252	23 fs	B(M1$\rightarrow 5/2_1^-$) = 0.084 W.u., log $ft = 6.20$ (β^- from $3/2^-$), (γ,γ'), (p,p′), (α,α'), (p,γ), (d,n), (^{3}He,d)
$13/2_1^-$	2311	0.15 ps	B(E2$\rightarrow 9/2_1^-$) = 0.007 W.u., Coul. ex., (p,p′)
$5/2_2^-$	2366	23 fs	B(M1/E2$\rightarrow 7/2_1^-$) = 0.032/13.0 W.u., B(E2$\rightarrow 5/2_1^-$) = 7.0 W.u., (γ,γ'), (p,p′), (p,γ)
$1/2_1^+$	2427	1.4 ps	(p,p′), (p,γ), (d,^{3}He), (^{3}He,d)
$3/2_3^-$	2563	7.7 fs	B(M1/E2$\rightarrow 5/2_1^-$) = 0.17/0.43 W.u. ($\delta = 0.09$), (γ,γ'), (p,p′), (p,γ), (d,n), (d,^{3}He), (^{3}He,d)
$7/2_4^-$	2727	0.98 ps	B(M1$\rightarrow 9/2_1^-$) = 0.0007 W.u., B(M1$\rightarrow 5/2_1^-$) = 0.00057 W.u., (γ,γ'), (p,p′), (p,γ), (d,^{3}He)
$9/2_2^-$	2824	11 fs	
$1/2_1^-$	2873	83 fs	(γ,γ'), (p,p′), (p,γ)
$3/2_4^-$	2953	13 fs	(p,p′), (p,γ)
$3/2_5^-$	3158	46 fs	(p,p′), (p,γ)
$11/2_1^-$	3845	<0.2 ps	B(M1/E2$\rightarrow 13/2_1^-$) > 0.015/ > 13 W.u., (p,p′)
$3/2_1^+$	4384		(α,α')
$1/2_2^+$	5960		(d,^{3}He)



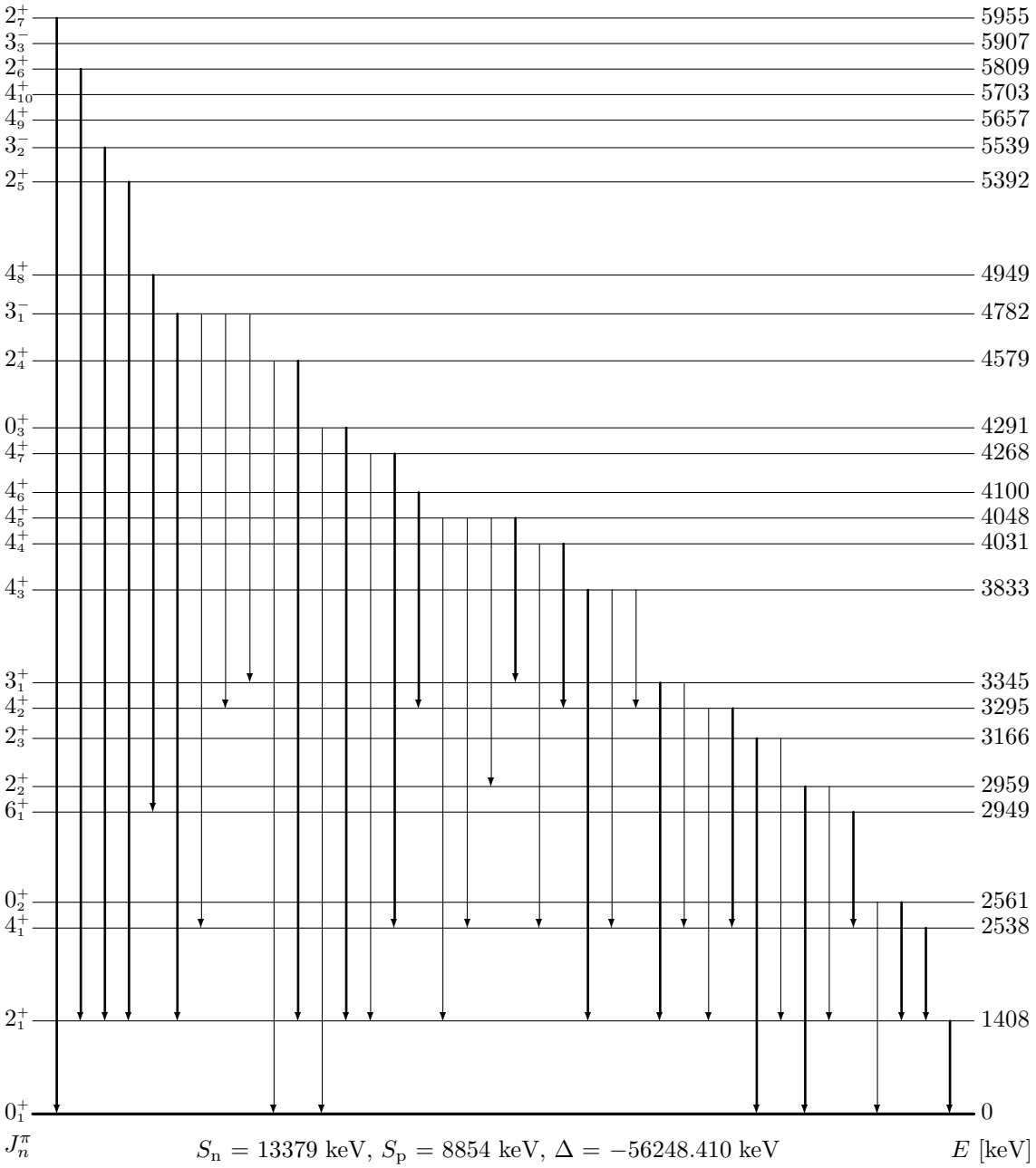
J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92J, 98B]
3^+_1	0	2.5785 h	μ = 3.2266 μ_n, (t,^{3}He), (d,p), (d,α), (^{3}He,p)
2^+_1	27	8.7 ns	B(M1→ 3^+_1) = 0.060 W.u., (t,^{3}He), (d,p), (d,α), (^{3}He,p)
1^+_1	111	5.08 ns	B(M1→ 2^+_1) = 0.0070 W.u., B(E2→ 3^+_1) = 1.7 W.u., log ft = 4.30 (β^- from 0^+), (t,^{3}He), (d,p), (d,α), (^{3}He,p)
4^+_1	212	30 ps	(t,^{3}He), (d,p), (^{3}He,p)
5^+_1	336	2.0 ns	(d,α)
3^+_2	341		(t,^{3}He), (d,p), (^{3}He,p)
3^+_3	454		(t,^{3}He), (d,p), (d,α), (^{3}He,p)
3^+_4	486		(t,^{3}He), (d,p), (d,α), (^{3}He,p)
3^+_5	753	<0.5 ps	(t,^{3}He), (d,p), (d,α)
1^+_2	1168		(t,^{3}He), (d,p), (^{3}He,p)
2^+_2	1744		(t,^{3}He), (d,p)
1^+_3	1834		(t,^{3}He), (d,p), (^{3}He,p)
2^+_3	2017		(t,^{3}He), (d,p)
3^-_1	2090		(d,p)
3^+_6	2255		(d,p), (^{3}He,p)
2^-_1	2321		(d,p)
2^+_4	2442		(d,p), (^{3}He,p)
1^+_4	2544		(^{3}He,p)
1^+_5	2890		(^{3}He,p)
1^+_6	3048		(d,p), (^{3}He,p)
1^+_7	3387		(d,p), (^{3}He,p)
1^+_8	3498		(d,p), (^{3}He,p)



J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [94J, 98B]
0^+_1	0	8.275 h	(^{3}He,n), (p,t)
2^+_1	850	0.7 ps	(^{3}He,n), (p,t)
4^+_1	2386	0.28 ps	(^{3}He,n), (p,t)
2^+_2	2760	0.14 ps	(^{3}He,n), (p,t)
4^+_2	3587	0.28 ps	(^{3}He,n), (p,t)
0^+_2	4146		(^{3}He,n), (p,t)
3^-_1	4397		(p,t)
2^+_3	4456		(^{3}He,n), (p,t)
5^-_1	5140		(p,t)
4^+_3	5328		(p,t)
0^+_3	5363		(^{3}He,n), (p,t)
4^+_4	5483		(p,t)
4^+_5	5529		(p,t)
6^+_1	5652		(p,t)
0^+_4	5718		(^{3}He,n), (p,t)
2^+_4	5829		(^{3}He,n), (p,t)
4^+_6	5965		(p,t)
2^+_5	6034		(^{3}He,n), (p,t)
2^+_6	6044		(^{3}He,n), (p,t)
4^+_7	6416		(p,t)
2^+_7	6483		(p,t)
3^-_2	6531		(^{3}He,n), (p,t)
1^-_1	6882		(p,t)
0^+_5	6927		(p,t)

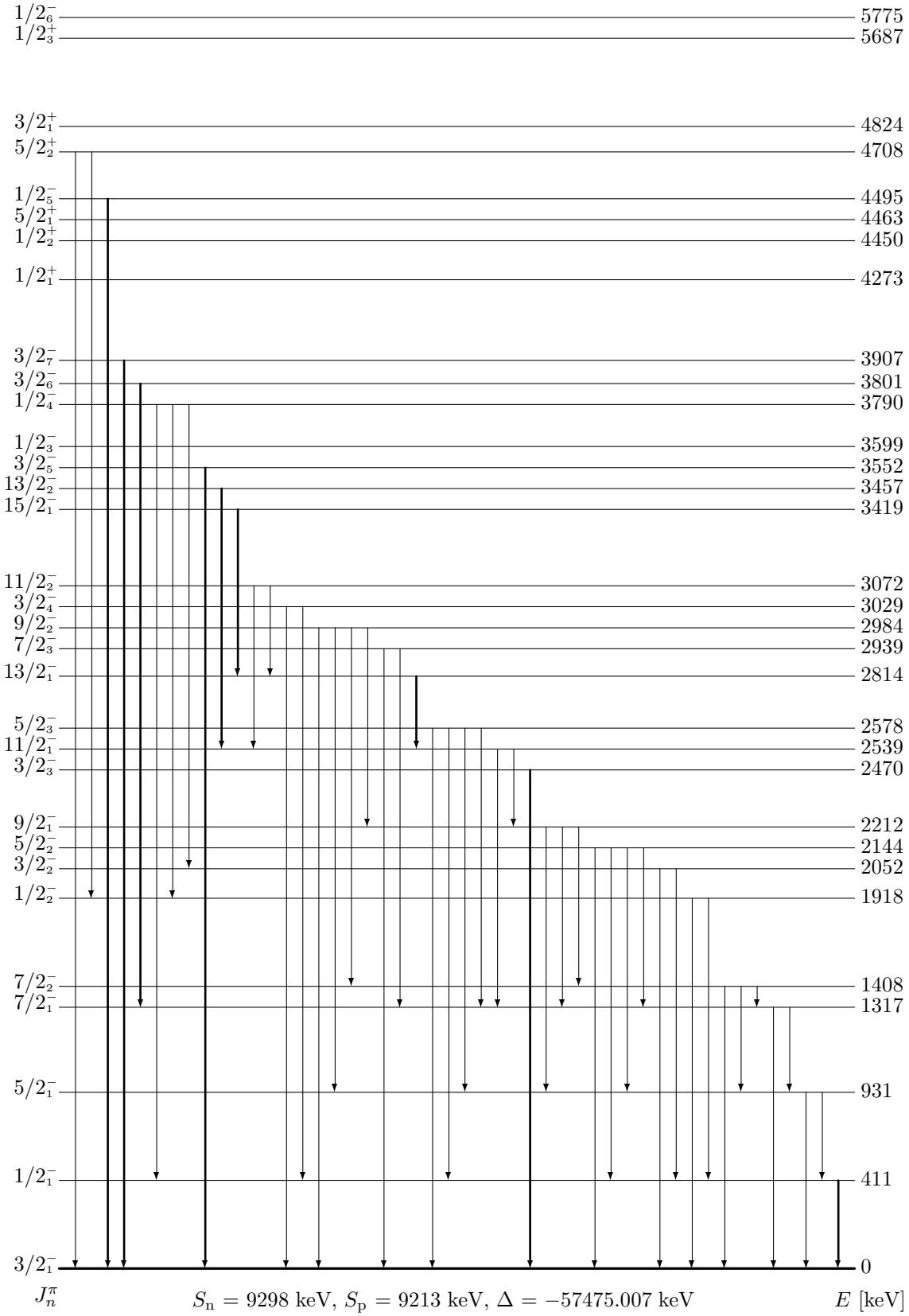


J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [90J, 98B]
$7/2_1^-$	0	8.51 m	log ft = 3.62 (β^+ from $(7/2^-)$), (p,d), (d,t)
$3/2_1^-$	741	63.5 ns	B(E2→ $7/2_1^-$) = 0.00337 W.u., (p,d), (d,t), $\mu = -0.386\ \mu_n$
$1/2_1^-$	774	2.0 ns	(p,d), (d,t)
$9/2_1^-$	1328	17 fs	B(M1/E2→ $7/2_1^-$) = 0.55/8 W.u. ($\delta = -0.11$), log ft = 4.44 (β^+ from $(7/2^-)$), (p,d), (d,t)
$5/2_1^-$	1424	2.8 ps	B(E2→ $1/2_1^-$) = 31 W.u., B(M1/E2→ $3/2_1^-$) = 0.017/11 W.u. ($\delta = 0.36$), (p,d), (d,t)
$7/2_2^-$	1696	1.4 ps	B(E2→ $3/2_1^-$) = $4. \cdot 10^1$ W.u., (p,d), (d,t)
$3/2_2^-$	2043	0.24 ps	B(E2→ $7/2_1^-$) = 5.6 W.u., (p,d), (d,t)
$1/2_1^+$	2315		(p,d)
$11/2_1^-$	2339	53 fs	B(M1/E2→ $9/2_1^-$) = 0.35/9 W.u. ($\delta = 0.11$), (p,d), (d,t)
$5/2_2^-$	2405		(p,d)
$7/2_3^-$	2845	33 fs	(p,d)
$1/2_2^+$	2967	78 fs	(p,d), (d,t)
$19/2_1^-$	3040	2.58 m	B(E4→ $11/2_1^-$) = 0.256 W.u., B(M5→ $9/2_1^-$) = 5.3 W.u., B(E6→ $7/2_1^-$) = 0.4 W.u., log ft = 3.60 (β^+ from $(19/2^-)$), (d,t)
$13/2_1^-$	3176	<132 fs	B(M1→ $11/2_1^-$) > 0.28 W.u.
$7/2_4^-$	3333		(p,d), (d,t)
$3/2_1^+$	3399		(p,d), (d,t)
$15/2_1^-$	3463		(d,t)
$7/2_5^-$	3567		(p,d), (d,t)

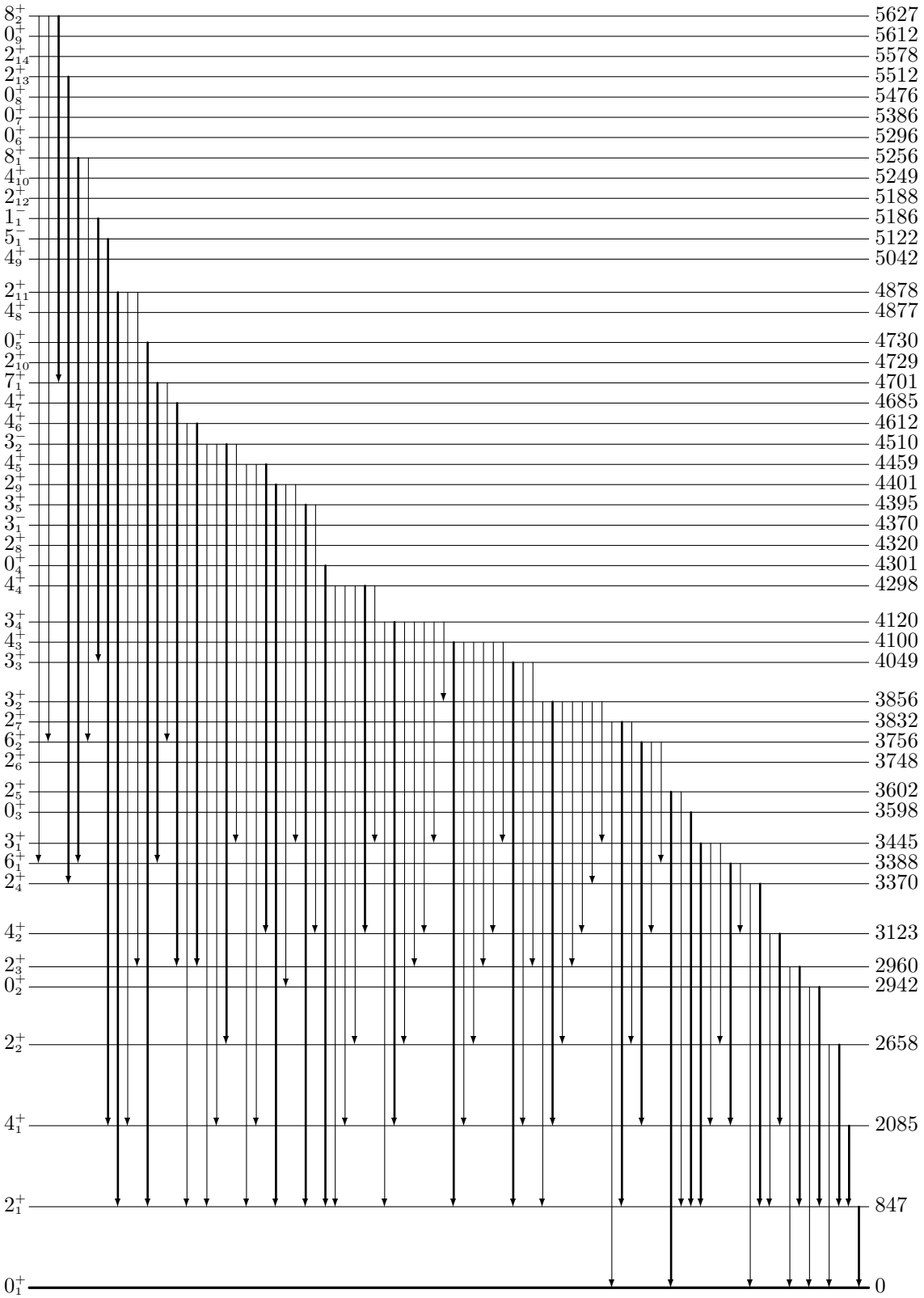


J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93J, 98B]
0^+_1	0	stable	log ft = 3.48 (β^+ from 0^+), (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (p,t), (^{3}He,n)
2^+_1	1408	0.80 ps	Q = −0.05 barn, μ = 2.40 μ_n
4^+_1	2538	4.0 ps	B(E2→ 2^+_1) = 6.3 W.u., Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (^{3}He,n)
0^+_2	2561	≥1.4 ps	B(E2→ 2^+_1) < 16 W.u., log ft = 7.40 (β^+ from 0^+), (p,p′), (d,d′), (p,t)

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93J, 98B]
6_1^+	2949	1.215 ns	B(E2→ 4_1^+) = 3.25 W.u., log ft = 5.18 (β^+ from $(7)^+$), μ = 8.22 μ_n, (e,e′)
2_2^+	2959	0.052 ps	B(M1/E2→ 2_1^+) = 0.051/0.5 W.u. (δ = 0.10), B(E2→ 0_1^+) = 2.2 W.u., Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (p,t), (^{3}He,n)
2_3^+	3166	0.17 ps	B(M1/E2→ 2_1^+) = 0.0035/1.0 W.u. (δ = 0.63), B(E2→ 0_1^+) = 0.74 W.u., (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (p,t), (^{3}He,n)
4_2^+	3295	≥2.1 ps	B(M1/E2→ 4_1^+) < 0.020/ < 2.7 W.u. (δ = 0.15), B(E2→ 2_1^+) < 0.15 W.u., (e,e′), (p,p′), (α,α'), (p,t)
3_1^+	3345	≥2.1 ps	B(M1/E2→ 4_1^+) < 0.0086/ < 0.022 W.u. (δ = 0.02), B(M1/E2→ 2_1^+) < 0.00068/ < 0.11 W.u. (δ = 0.51), (e,e′), (p,p′), (d,d′)
4_3^+	3833	0.062 ps	B(M1/E2→ 4_2^+) = 0.011/8. · 10^1 W.u., B(E2→ 4_1^+) = 18 W.u., B(E2→ 2_1^+) = 7.9 W.u., (p,p′), (α,α'), (p,t), (^{3}He,n)
4_4^+	4031	≥0.7 ps	B(M1/E2→ 4_2^+) < 0.033/ < 1.3 · 10^2 W.u., B(M1/E2→ 4_1^+) < 0.0014/ < 1.5 W.u. (δ = −1.2), (p,p′), (p,t)
4_5^+	4048	0.30 ps	B(M1/E2→ 3_1^+) = 0.15/32 W.u. (δ = 0.23), B(E2→ 2_1^+) = 0.20 W.u., (p,p′), (α,α')
4_6^+	4100		(e,e′)
4_7^+	4268	0.082 ps	B(M1/E2→ 4_1^+) = 0.032/6 W.u. (δ = −0.53), B(E2→ 2_1^+) = 0.60 W.u., (p,p′), (α,α'), (p,t)
0_3^+	4291	0.055 ps	B(E2→ 2_1^+) = 4.3 W.u., (γ,γ'), (p,p′), (^{3}He,n)
2_4^+	4579	≤0.007 ps	B(M1→ 2_1^+) > 0.067 W.u., B(E2→ 0_1^+) > 0.99 W.u., (e,e′), (p,p′), (α,α'), (^{3}He,n)
3_1^-	4782	0.033 ps	B(E1→ 3_1^+) = 0.00055 W.u., B(E1→ 4_2^+) = 0.0008 W.u., B(E1→ 4_1^+) = 0.00022 W.u., (e,e′), (p,p′), (d,d′), (α,α'), (p,t)
4_8^+	4949	0.029 ps	B(E2→ 6_1^+) = 5.0 W.u., B(M1/E2→ 4_1^+) = 0.026/1.2 W.u. (δ = −0.36), (p,p′), (α,α')
2_5^+	5392		(p,p′), (^{3}He,n)
3_2^-	5539		(p,p′)
4_9^+	5657		(p,p′)
4_{10}^+	5703		(p,p′)
2_6^+	5809		(p,p′)
3_3^-	5907		(p,p′)
2_7^+	5955		(p,p′)
2_8^+	6192		(p,p′)
3_4^-	6341		(p,p′), (α,α'), (p,t)
8_1^+	6381	114 fs	B(E2→ 6_1^+) = 0.86 W.u.
0_4^+	6400		(^{3}He,n)
3_5^-	6401		(e,e′), (p,p′), (d,d′), (p,t)
2_9^+	6429		(p,p′), (p,t)
4_{11}^+	6484		(p,p′)
10_1^+	6527	364 ns	B(E2→ 8_1^+) = 1.69 W.u., B(E4→ 6_1^+) = 0.79 W.u., Q = 0.285 barn, μ = 7.281 μ_n, (p,p′), (p,t)
4_{12}^+	6607		(p,p′)
4_{13}^+	6670		(p,p′)
3_6^-	6710		(p,p′), (p,t)
3_7^-	6749		(p,p′)
1_1^-	6774		(p,p′)
4_{14}^+	6881		(p,p′)


1/2⁻₆ 5775
1/2⁺₃ 5687
3/2⁺₁ 4824
5/2⁺₂ 4708
1/2⁻₅ 4495
5/2⁺₁ 4463
1/2⁺₂ 4450
1/2⁺₁ 4273
3/2⁻₇ 3907
3/2⁻₆ 3801
1/2⁻₄ 3790
1/2⁻₃ 3599
3/2⁻₅ 3552
13/2⁻₂ 3457
15/2⁻₁ 3419
11/2⁻₂ 3072
3/2⁻₄ 3029
9/2⁻₂ 2984
7/2⁻₃ 2939
13/2⁻₁ 2814
5/2⁻₃ 2578
11/2⁻₁ 2539
3/2⁻₃ 2470
9/2⁻₁ 2212
5/2⁻₂ 2144
3/2⁻₂ 2052
1/2⁻₂ 1918
7/2⁻₂ 1408
7/2⁻₁ 1317
5/2⁻₁ 931
1/2⁻₁ 411
3/2⁻₁ 0
J^π_n
$S_n = 9298$ keV, $S_p = 9213$ keV, $\Delta = -57475.007$ keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [91J, 98B]
$3/2_1^-$	0	2.73 y	(p,n), (p,d), (d,p), (d,t), (t,d), (p,t), (α,^{3}He), (^{3}He,α)
$1/2_1^-$	411	6 ps	B(M1/E2→ $3/2_1^-$) = 0.05/5 W.u. (δ = −0.09), (p,n), (p,d), (d,p), (d,t), (t,d), (p,t), (α,^{3}He), (^{3}He,α)
$5/2_1^-$	931	8 ps	B(E2→ $1/2_1^-$) = 3.0 W.u., B(M1/E2→ $3/2_1^-$) = 0.0030/0.8 W.u. (δ = 0.34), log ft = 6.25 (β^+ from $7/2^-$), μ = 2.7 μ_n, (p,n), (p,d), (d,p), (d,t), (t,d), (p,t), (α,^{3}He), (^{3}He,α)
$7/2_1^-$	1317	2.1 ps	B(M1/E2→ $5/2_1^-$) = 0.013/0.9 W.u. (δ = −0.07), B(E2→ $3/2_1^-$) = 5 W.u., log ft = 6.72 (β^+ from $7/2^-$), μ = 2.2 μ_n, (p,n), (p,d), (d,p), (d,t), (p,t), (α,^{3}He), (^{3}He,α)
$7/2_2^-$	1408	37.9 ps	B(M1/E2→ $5/2_1^-$) = 0.0028/0.12 W.u. (δ = −0.07), B(E2→ $3/2_1^-$) = 0.095 W.u., log ft = 5.79 (β^+ from $7/2^-$), μ = −2.2 μ_n, (p,n), (p,d), (d,p), (d,t), (p,t), (α,^{3}He), (^{3}He,α)
$1/2_2^-$	1918	12 fs	(d,p), (t,d), (p,t)
$3/2_2^-$	2052	7.6 fs	(d,p), (t,d), (p,t)
$5/2_2^-$	2144	38 fs	log ft = 6.69 (β^+ from $7/2^-$), (p,n), (d,p), (α,^{3}He), (^{3}He,α)
$9/2_1^-$	2212	0.76 ps	B(M1/E2→ $7/2_2^-$) = 0.052/7.3 W.u. (δ = −0.21), log ft = 6.11 (β^+ from $7/2^-$), (d,p), (p,t)
$3/2_3^-$	2470	15 fs	(d,p), (d,t), (t,d), (p,t), (α,^{3}He)
$11/2_1^-$	2539	9.3 ps	B(M1/E2→ $9/2_1^-$) = 0.00065/0.50 W.u. (δ = −0.20), B(E2→ $7/2_1^-$) = 1.69 W.u., (d,p)
$5/2_3^-$	2578	46 fs	log ft = 7.44 (β^+ from $7/2^-$), (d,p)
$13/2_1^-$	2814	10.0 ps	B(M1/E2→ $11/2_1^-$) = 0.106/1.2 W.u. (δ = −0.02), (d,p), (α,^{3}He)
$7/2_3^-$	2939	29 fs	(p,n), (p,d), (d,p), (α,^{3}He), (^{3}He,α)
$9/2_2^-$	2984		(d,p)
$3/2_4^-$	3029	15 fs	(d,p)
$11/2_2^-$	3072	>0.7 ps	B(M1/E2→ $13/2_1^-$) < 0.31/ < 43 W.u. (δ = −0.03), B(M1/E2→ $11/2_1^-$) < 0.17/ < $1.0 \cdot 10^2$ W.u. (δ = 0.25), (p,t)
$15/2_1^-$	3419	0.07 ps	B(M1/E2→ $13/2_1^-$) = 1.4/39 W.u. (δ = 0.07), (d,p)
$13/2_2^-$	3457	>0.6 ps	B(M1→ $11/2_1^-$) < 0.048 W.u., (d,p)
$3/2_5^-$	3552	<3.5 fs	(p,n), (d,p), (α,^{3}He), (^{3}He,α)
$1/2_3^-$	3599		(d,p), (p,t), (^{3}He,α)
$1/2_4^-$	3790	<11 fs	(p,n), (d,p), (p,t)
$3/2_6^-$	3801		(d,p)
$3/2_7^-$	3907	<3.5 fs	(d,p), (p,t), (^{3}He,α)
$1/2_1^+$	4273		(d,p), (^{3}He,α)
$1/2_2^+$	4450		(p,d), (^{3}He,α)
$5/2_1^+$	4463		(d,p)
$1/2_5^-$	4495	3.5 fs	(d,p)
$5/2_2^+$	4708	4.2 fs	(d,p)
$3/2_1^+$	4824		(p,d), (d,p)
$1/2_3^+$	5687		(d,p)
$1/2_6^-$	5775		(d,p)
$1/2_4^+$	6282		(d,p)
$1/2_5^+$	6962		(d,p)
$7/2_4^-$	7780		(p,d)
$1/2_6^+$	8843		(d,p)
$1/2_7^+$	8910		(d,p)


8^+_2 5627
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2^+_{13} 5512
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0^+_7 5386
0^+_6 5296
8^+_1 5256
4^+_{10} 5249
2^+_{12} 5188
1^-_1 5186
5^-_1 5122
4^+_9 5042
2^+_{11} 4878
4^+_8 4877
0^+_5 4730
2^+_{10} 4729
7^+_1 4701
4^+_7 4685
4^+_6 4612
3^-_2 4510
4^+_5 4459
2^+_9 4401
3^+_5 4395
3^-_1 4370
2^+_8 4320
0^+_4 4301
4^+_4 4298
3^+_4 4120
4^+_3 4100
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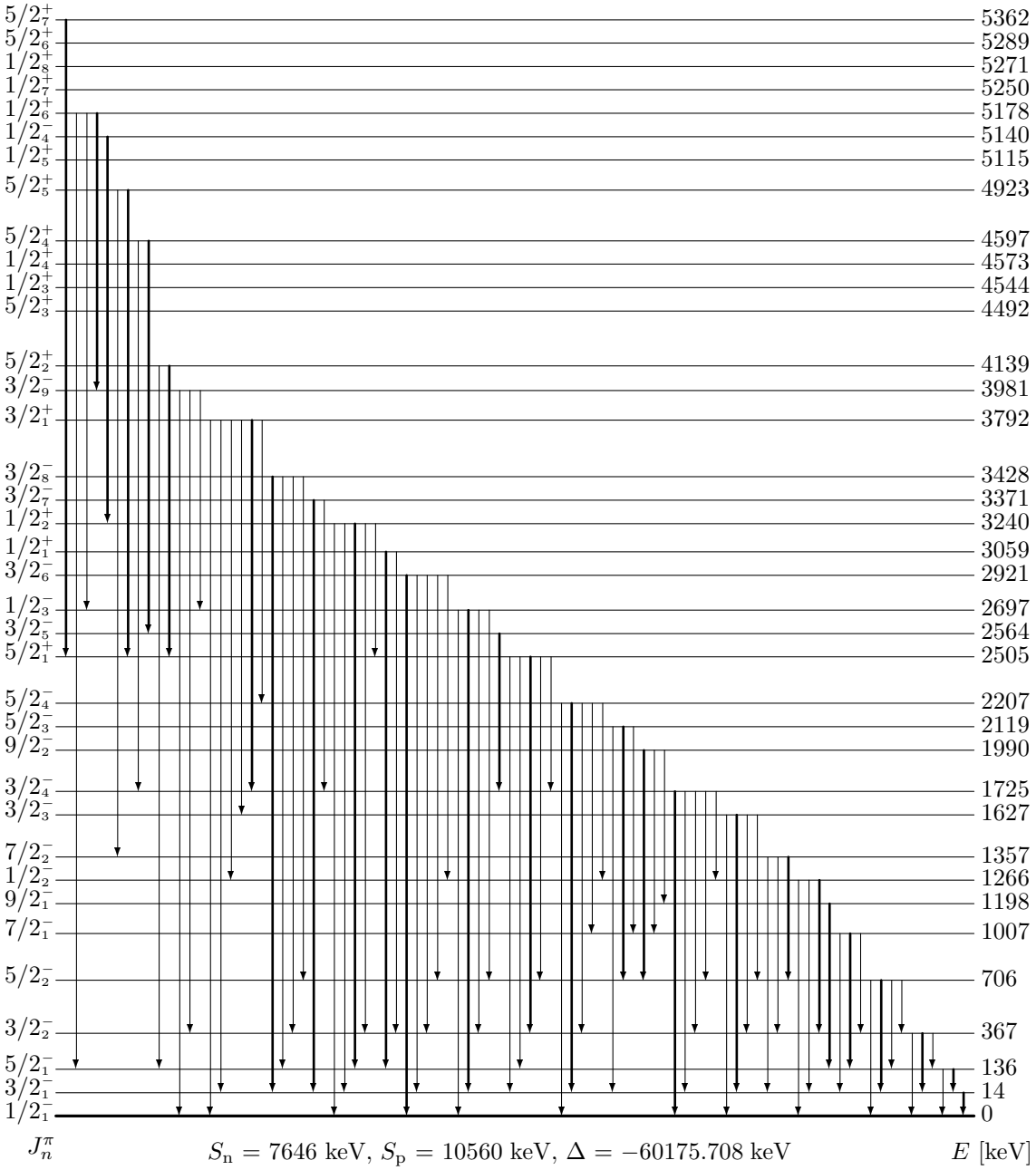
3^+_2 3856
2^+_7 3832
6^+_2 3756
2^+_6 3748
2^+_5 3602
0^+_3 3598
3^+_1 3445
6^+_1 3388
2^+_4 3370
4^+_2 3123
2^+_3 2960
0^+_2 2942
2^+_2 2658
4^+_1 2085
2^+_1 847
0^+_1 0
J^π_n
S_n = 11198 keV, S_p = 10184 keV, Δ = −60601.003 keV
E [keV]

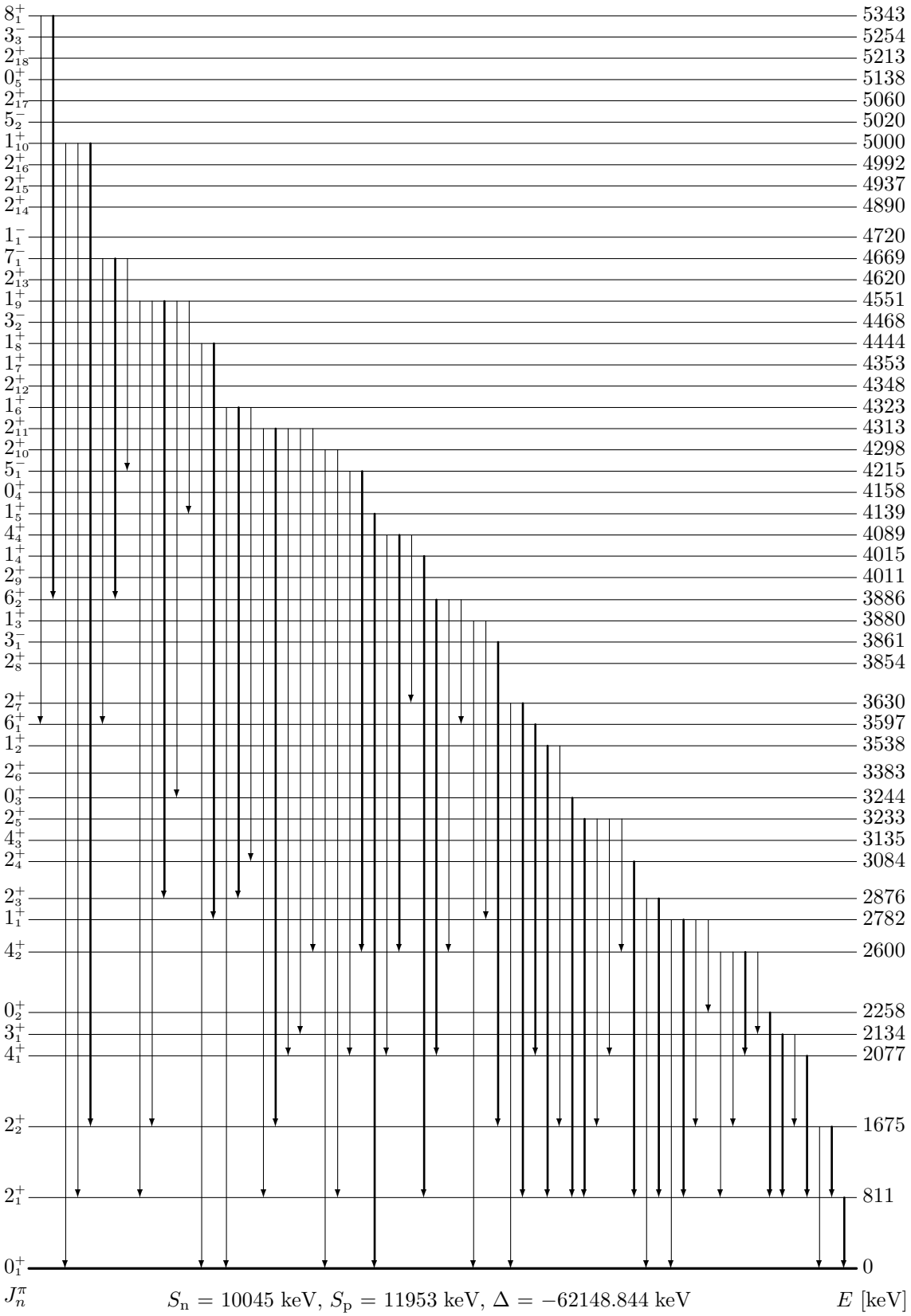
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92J, 98B]
0_1^+	0	stable	(γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (d,t), (p,t), (t,p), (^{3}He,n)
2_1^+	847	6.07 ps	B(E2→ 0_1^+) = 16.8 W.u., log ft = 7.10 (β^- from 3^+), Q = −0.19 barn, μ = −1.22 μ_n, (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (d,t), (p,t), (t,p)
4_1^+	2085	0.64 ps	B(E2→ 2_1^+) = 24 W.u., log ft = 9.04 (β^- from 3^+), log ft = 8.63 (β^+ from 4^+), (p,p′), (d,d′), (α,α'), (d,t), (p,t), (t,p)
2_2^+	2658	21 fs	B(M1/E2→ 2_1^+) = 0.166/3.3 W.u. (δ = −0.18), log ft = 5.62 (β^- from 3^+), (e,e′), (p,p′), (d,d′), (α,α'), (d,t), (t,p)
0_2^+	2942	0.45 ps	B(E2→ 2_1^+) = 2.4 W.u., (p,p′), (d,t), (t,p)
2_3^+	2960	28 fs	B(M1/E2→ 2_1^+) = 0.076/2.5 W.u. (δ = 0.27), log ft = 5.33 (β^- from 3^+), log ft = 9.97 (β^+ from 4^+), (e,e′), (p,p′), (d,d′), (d,t), (t,p)
4_2^+	3123	47 fs	B(M1→ 4_1^+) < 0.53 W.u., B(E2→ 2_1^+) = 0.12 W.u., log ft = 7.50 (β^- from 3^+), log ft = 7.64 (β^+ from 4^+), (p,p′), (d,d′), (α,α'), (d,t), (t,p)
2_4^+	3370	17 fs	B(M1/E2→ 2_1^+) = 0.065/1.3 W.u. (δ = 0.25), log ft = 5.19 (β^- from 3^+), log ft = 10.10 (β^+ from 4^+), (e,e′), (p,p′), (d,d′), (d,t), (t,p)
6_1^+	3388	2.9 ps	B(E2→ 4_1^+) = 4.0 W.u., (p,p′), (α,α'), (d,t)
3_1^+	3445	29 fs	B(M1/E2→ 2_2^+) = 0.013/30 W.u. (δ = 0.85), B(M1/E2→ 4_1^+) = 0.059/0.78 W.u. (δ = −0.11), B(M1/E2→ 2_1^+) = 0.032/0.74 W.u. (δ = −0.28), log ft = 6.60 (β^- from 3^+), log ft = 6.97 (β^+ from 4^+), (p,p′), (d,t), (t,p)
0_3^+	3598	<59 fs	(p,p′), (d,d′), (d,t), (t,p)
2_5^+	3602	0.15 ps	(γ,γ'), (e,e′), (p,p′)
2_6^+	3748		(p,p′), (d,t)
6_2^+	3756	0.13 ps	B(M1/E2→ 6_1^+) = 0.61/ < 57 W.u. (δ = 0.07), B(E2→ 4_1^+) = 21 W.u., (α,α')
2_7^+	3832	39 fs	(e,e′), (p,p′), (d,d′), (d,t), (t,p)
3_2^+	3856	25 fs	B(M1/E2→ 4_1^+) = 0.145/ < 0.005 W.u. (δ = −0.004), B(M1/E2→ 2_1^+) = 0.00189/0.0018 W.u. (δ = 0.065), B(M1→ 4_2^+) = 0.026 W.u., log ft = 6.69 (β^+ from 4^+), (p,p′), (d,t)
3_3^+	4049	7 fs	B(M1/E2→ 2_3^+) = 0.26/8 W.u. (δ = 0.43), B(M1/E2→ 4_1^+) = 0.07/1.8 W.u. (δ = 0.22), B(M1/E2→ 2_1^+) = 0.06/3.0 W.u. (δ = 0.50), log ft = 7.06 (β^+ from 4^+), (p,p′), (d,t), (t,p)
4_3^+	4100	43 fs	B(M1/E2→ 4_2^+) = 0.063/0.7 W.u. (δ = 0.07), B(M1/E2→ 4_1^+) = 0.0104/2.4 W.u. (δ = 0.68), B(E2→ 2_1^+) = 1.74 W.u., log ft = 6.45 (β^+ from 4^+), (p,p′), (d,d′), (d,t), (t,p)
3_4^+	4120	0.14 ps	B(M1/E2→ 2_3^+) = 0.0010/0.006 W.u. (δ = 0.064), B(M1/E2→ 4_1^+) = 0.015/0.038 W.u. (δ = −0.073), B(M1/E2→ 2_1^+) = 0.00068/0.023 W.u. (δ = 0.420), log ft = 6.44 (β^+ from 4^+), (p,p′), (d,t)
4_4^+	4298	110 fs	B(M1/E2→ 4_2^+) = 0.07/2.1 W.u. (δ = 0.14), B(M1/E2→ 4_1^+) = 0.00020/0.7 W.u. (δ = −3.0), B(E2→ 2_1^+) = 0.21 W.u., log ft = 6.49 (β^+ from 4^+), (p,p′), (d,t)
0_4^+	4301		(t,p)
2_8^+	4320	37 fs	(e,e′)

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92J, 98B]
3_1^-	4370		(α,α')
3_5^+	4395	35 fs	B(M1/E2$\rightarrow 2_1^+$) = 0.011/0.16 W.u. ($\delta = -0.30$), log ft = 7.29 (β^+ from 4^+), (p,p′), (d,t)
2_9^+	4401		(p,p′), (t,p)
4_5^+	4459	26 fs	log ft = 6.86 (β^+ from 4^+), (p,p′), (d,t), (t,p)
3_2^-	4510	83 fs	(e,e′), (p,p′), (d,d′), (α,α'), (d,t), (t,p)
4_6^+	4612		(p,p′), (d,t), (t,p)
4_7^+	4685		(p,p′), (d,t)
7_1^+	4701	0.083 ps	B(M1/E2$\rightarrow 6_1^+$) = 0.10/ < 3.6 W.u. ($\delta = -0.08$)
2_{10}^+	4729	63 fs	(e,e′), (p,p′)
0_5^+	4730		(t,p), (^{3}He,n)
4_8^+	4877		(p,p′), (d,t)
2_{11}^+	4878		(t,p)
4_9^+	5042		(e,e′), (p,p′), (α,α'), (d,t), (t,p)
5_1^-	5122		(p,p′)
1_1^-	5186		(p,p′)
2_{12}^+	5188		(p,p′), (t,p)
4_{10}^+	5249		(p,p′)
8_1^+	5256	0.35 ps	B(E2$\rightarrow 6_2^+$) = 4.2 W.u., B(E2$\rightarrow 6_1^+$) = 4.2 W.u.
0_6^+	5296		(p,p′), (t,p)
0_7^+	5386		(p,p′)
0_8^+	5476		(p,p′), (t,p)
2_{13}^+	5512		(p,p′), (t,p)
2_{14}^+	5578		(p,p′), (t,p)
0_9^+	5612		(p,p′), (t,p)
8_2^+	5627	0.069 ps	B(M1/E2$\rightarrow 7_1^+$) = 0.33/5. $\cdot 10^1$ W.u. ($\delta = 0.25$), B(E2$\rightarrow 6_2^+$) < 2.9 W.u., B(E2$\rightarrow 6_1^+$) = 0.9 W.u., (p,p′)
4_{11}^+	5863		(p,p′), (t,p)
2_{15}^+	5932		(p,p′), (t,p)
2_{16}^+	6055		(p,p′), (t,p)
6_3^+	6072		(p,p′)
0_{10}^+	6110		(t,p)
4_{12}^+	6265		(p,p′), (t,p)
0_{11}^+	6509		(p,p′), (^{3}He,n)
0_{12}^+	6563		(p,p′), (t,p)
3_3^-	6662		(p,p′), (t,p)
0_{13}^+	6700		(p,p′), (t,p)
3_4^-	6781		(p,p′), (t,p)
0_{14}^+	6800		(p,p′), (t,p)
1_1^+	7066	0.41 fs	(γ,γ'), (t,p)
0_{15}^+	7124		(p,p′), (t,p)
0_{16}^+	7220		(t,p)
0_{17}^+	7290		(t,p)
3_5^-	7630		(t,p)
2_{17}^+	7870		(t,p)
0_{18}^+	8110		(^{3}He,n)
2_{18}^+	8120		(t,p)
1_2^-	9140	1.28 eV	B(E1$\rightarrow 0_1^+$) = 0.00170 W.u., (γ,γ')
0_{19}^+	9200		(^{3}He,n)



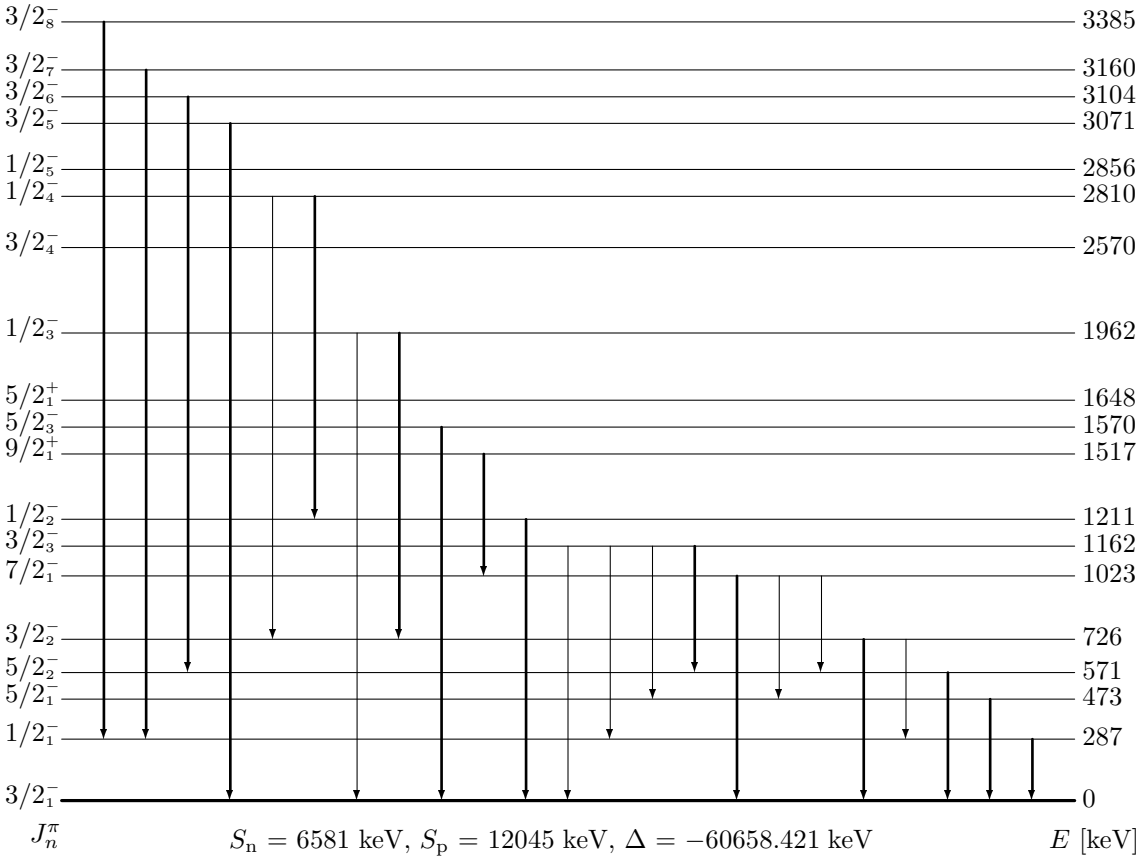
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92B3, 98B]
$1/2_1^-$	0	stable	$\mu = 0.09044\ \mu_n$
$3/2_1^-$	14	97.9 ns	B(M1/E2→ $1/2_1^-$) = 0.0082/0.37 W.u. ($\delta = 0.0022$), log ft = 4.83 (β^- from $5/2^-$), $Q = -0.082$ barn, $\mu = -0.1549\ \mu_n$
$5/2_1^-$	136	8.7 ns	B(M1/E2→ $3/2_1^-$) = 0.00118/2.3 W.u. ($\delta = 0.120$), B(E2→ $1/2_1^-$) = 10.9 W.u., log ft = 5.40 (β^- from $5/2^-$), log ft = 6.45 (β^+ from $7/2^-$), $\mu = 0.935\ \mu_n$

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92B3, 98B]
$3/2_2^-$	367	10.5 ps	B(M1/E2→ $5/2_1^-$) = 0.0124/0.2 W.u. ($\delta = 0.02$), B(M1/E2→ $3/2_1^-$) = 0.038/0.4 W.u. ($\delta = 0.025$), B(M1/E2→ $1/2_1^-$) = 0.0049/12.3 W.u. ($\delta = -0.45$), log ft = 6.10 (β^- from $5/2^-$), $\mu < 0.6\ \mu_n$
$5/2_2^-$	706	4.1 ps	B(M1/E2→ $3/2_2^-$) = 0.0020/0.23 W.u. ($\delta = 0.083$), B(M1/E2→ $5/2_1^-$) = 0.0027/0.15 W.u. ($\delta = 0.097$), B(M1/E2→ $3/2_1^-$) = 0.011/10 W.u. ($\delta = -0.465$), B(E2→ $1/2_1^-$) = 2.9 W.u., log ft = 5.40 (β^- from $5/2^-$), log ft = 7.71 (β^+ from $7/2^-$)
$7/2_1^-$	1007	0.13 ps	B(M1/E2→ $5/2_1^-$) = $0.12/^{>30}_{<2.7\cdot10^2}$ W.u. ($\delta = -0.6$), B(E2→ $3/2_2^-$) < $1.8 \cdot 10^2$ W.u., B(E2→ $3/2_1^-$) < $1.8 \cdot 10^2$ W.u., log ft = 6.30 (β^- from $5/2^-$), (p,p′), (d,p)
$9/2_1^-$	1198	2.9 ps	B(E2→ $5/2_1^-$) = 11.1 W.u., (p,p′), (d,p)
$1/2_2^-$	1266	82 fs	(p,p′), (d,p), (p,d), (d,t)
$7/2_2^-$	1357	0.18 ps	B(M1/E2→ $5/2_2^-$) = $0.11/^{>3\cdot10^2}_{<1\cdot10^3}$ W.u. ($\delta = 1.1$), B(E2→ $3/2_2^-$) < 90 W.u., B(E2→ $3/2_1^-$) < 17 W.u., (p,p′), (d,p)
$3/2_3^-$	1627	56 fs	B(M1/E2→ $3/2_1^-$) = 0.049/4.6 W.u. ($\delta = -0.35$), log ft = 5.00 (β^- from $5/2^-$), (p,p′), (d,p)
$3/2_4^-$	1725	33 fs	B(M1→ $1/2_1^-$) = 0.089 W.u., log ft = 5.50 (β^- from $5/2^-$), (p,p′), (d,p)
$9/2_2^-$	1990	0.18 ps	B(M1/E2→ $7/2_1^-$) = $0.0019/8. \cdot 10^1$ W.u. ($\delta = -4.5$), B(E2→ $5/2_2^-$) = $3. \cdot 10^1$ W.u.
$5/2_3^-$	2119	46 fs	B(M1/E2→ $5/2_2^-$) = 0.09/0.5 W.u. ($\delta = -0.08$), (p,p′), (d,p)
$5/2_4^-$	2207	10 fs	(p,p′), (d,p), (p,d), (d,t)
$5/2_1^+$	2505	78 fs	(p,p′), (d,p)
$3/2_5^-$	2564		(p,p′), (d,p)
$1/2_3^-$	2697	6.2 fs	(p,p′), (d,p)
$3/2_6^-$	2921	33 fs	(p,p′), (d,p)
$1/2_1^+$	3059		(p,p′), (d,p)
$1/2_2^+$	3240		(p,p′), (d,p)
$3/2_7^-$	3371		(p,p′), (d,p)
$3/2_8^-$	3428	3.0 fs	(p,p′), (d,p)
$3/2_1^+$	3792		
$3/2_9^-$	3981	7 fs	(p,p′), (d,p)
$5/2_2^+$	4139	15 fs	(p,p′), (d,p)
$5/2_3^+$	4492		(p,p′), (d,p)
$1/2_3^+$	4544		(p,p′), (d,p)
$1/2_4^+$	4573		(p,p′), (d,p)
$5/2_4^+$	4597	5 fs	(p,p′), (d,p)
$5/2_5^+$	4923	7 fs	(p,p′), (d,p)
$1/2_5^+$	5115		(p,p′), (d,p)
$1/2_4^-$	5140		(p,p′), (d,p)
$1/2_6^+$	5178		(p,p′), (d,p)
$1/2_7^+$	5250		(p,p′), (d,p)
$1/2_8^+$	5271		(p,p′), (d,p)
$5/2_6^+$	5289		(p,p′), (d,p), (p,d), (d,t)
$5/2_7^+$	5362	6 fs	(p,p′), (d,p)
$1/2_9^+$	5500		(p,p′), (d,p)
$1/2_{10}^+$	5525		(p,p′), (d,p)

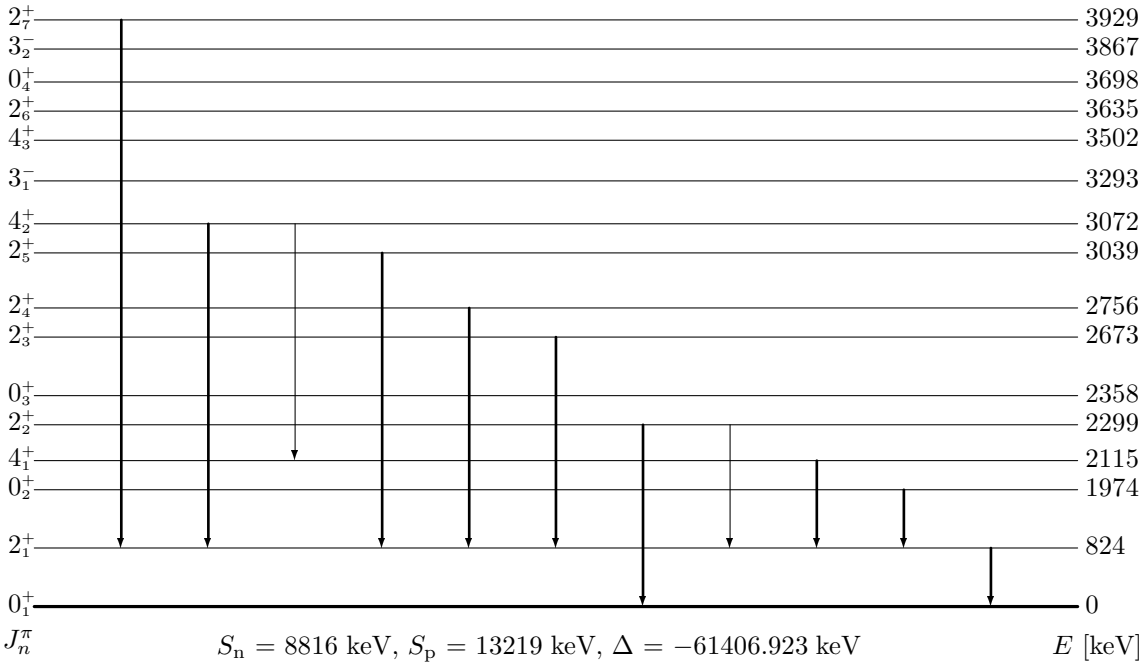

8^+_1 5343
3^-_3 5254
2^+_{18} 5213
0^+_5 5138
2^+_{17} 5060
5^-_2 5020
1^+_{10} 5000
2^+_{16} 4992
2^+_{15} 4937
2^+_{14} 4890
1^-_1 4720
7^-_1 4669
2^+_{13} 4620
1^+_9 4551
3^-_2 4468
1^+_8 4444
1^+_7 4353
2^+_{12} 4348
1^+_6 4323
2^+_{11} 4313
2^+_{10} 4298
5^-_1 4215
0^+_4 4158
1^+_5 4139
4^+_4 4089
1^+_4 4015
2^+_9 4011
6^+_2 3886
1^+_3 3880
3^-_1 3861
2^+_8 3854
2^+_7 3630
6^+_1 3597
1^+_2 3538
2^+_6 3383
0^+_3 3244
2^+_5 3233
4^+_3 3135
2^+_4 3084
2^+_3 2876
1^+_1 2782
4^+_2 2600
0^+_2 2258
3^+_1 2134
4^+_1 2077
2^+_2 1675
2^+_1 811
0^+_1 0
J^π_n
S_n = 10045 keV, S_p = 11953 keV, Δ = −62148.844 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [97B, 98B]
0_1^+	0	stable	log $ft = 4.90$ (β^- from 0^+)
2_1^+	811	6.54 ps	B(E2$\rightarrow 0_1^+$) = 18.5 W.u., log $ft = 6.61$ (β^+ from 2^+), $Q = -0.27$ barn, $\mu = 0.92\ \mu_n$, Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (d,p), (d,^{3}He), (t,p)
2_2^+	1675	1.6 ps	B(M1/E2$\rightarrow 2_1^+$) = 0.0003/0.4 W.u. ($\delta = -0.69$), B(E2$\rightarrow 0_1^+$) = 2.0 W.u., log $ft = 7.70$ (β^+ from 2^+), (p,p′), (d,d′), (α,α'), (d,p), (d,^{3}He), (t,p)
4_1^+	2077	0.24 ps	B(E2$\rightarrow 2_1^+$) = 54 W.u., log $ft = 6.88$ (β^- from 3^+), (p,p′), (α,α'), (d,^{3}He)
3_1^+	2134	2.2 ps	B(M1/E2$\rightarrow 2_1^+$) = 0.0027/0.48 W.u. ($\delta = -0.40$), B(M1$\rightarrow 2_2^+$) = 0.027 W.u., log $ft = 5.56$ (β^- from 3^+), (p,p′), (d,p), (t,p)
0_2^+	2258	>2.6 ps	(p,p′), (d,p), (t,p)
4_2^+	2600	0.37 ps	B(M1/E2$\rightarrow 4_1^+$) = 0.15/24 W.u. ($\delta = -0.15$), B(M1$\rightarrow 3_1^+$) = 0.08 W.u., B(E2$\rightarrow 2_2^+$) = 29 W.u., B(E2$\rightarrow 2_1^+$) = 1.8 W.u., log $ft = 6.31$ (β^- from 3^+), (p,p′), (d,d′), (α,α'), (d,p), (d,^{3}He), (t,p)
1_1^+	2782	0.18 ps	B(M1/E2$\rightarrow 2_2^+$) = 0.019/0.9 W.u. ($\delta = -0.18$), B(M1/E2$\rightarrow 2_1^+$) = 0.0070/0.10 W.u. ($\delta = -0.17$), (p,p′), (d,p), (t,p)
2_3^+	2876	0.094 ps	B(M1/E2$\rightarrow 2_1^+$) = 0.024/1.2 W.u. ($\delta = -0.33$), log $ft = 6.00$ (β^- from 0^+), log $ft = 7.86$ (β^- from 3^+), (p,p′), (d,p), (t,p)
2_4^+	3084	0.025 ps	B(M1/E2$\rightarrow 2_1^+$) = 0.075/0.07 W.u. ($\delta = -0.05$), (p,p′), (d,p), (d,^{3}He), (t,p)
4_3^+	3135		(p,p′), (t,p)
2_5^+	3233	0.21 ps	log $ft = 6.34$ (β^- from 3^+), (p,p′), (d,p)
0_3^+	3244		log $ft = 5.40$ (β^- from 0^+), (t,p)
2_6^+	3383		(p,p′)
1_2^+	3538	0.006 ps	B(M1/E2$\rightarrow 2_2^+$) = 0.06/12 W.u. ($\delta = -0.59$), B(M1/E2$\rightarrow 2_1^+$) = 0.09/8 W.u. ($\delta = -0.57$), (p,p′), (d,p), (t,p)
6_1^+	3597	0.34 ps	B(E2$\rightarrow 4_1^+$) = 15.4 W.u., (d,^{3}He)
2_7^+	3630	0.015 ps	log $ft = 6.63$ (β^- from 3^+), (d,d′), (d,p), (t,p)
2_8^+	3854		(d,p)
3_1^-	3861	0.09 ps	(e,e′), (p,p′), (d,d′), (α,α'), (t,p)
1_3^+	3880	<0.003 ps	B(M1$\rightarrow 2_1^+$) > 0.085 W.u., (d,p)
6_2^+	3886	0.48 ps	B(E2$\rightarrow 4_1^+$) = 0.112 W.u., (d,^{3}He)
2_9^+	4011		(d,p), (t,p)
1_4^+	4015	0.008 ps	
4_4^+	4089	0.06 ps	log $ft = 6.87$ (β^- from 3^+), (p,p′), (d,^{3}He), (t,p)
1_5^+	4139	2.8 fs	(d,p)
0_4^+	4158		(d,p), (t,p)
5_1^-	4215	0.45 ps	B(E1$\rightarrow 4_1^+$) = $1.6 \cdot 10^{-5}$ W.u., (d,p), (t,p)
2_{10}^+	4298	2.8 fs	(p,p′), (d,p), (t,p)
2_{11}^+	4313	11 fs	log $ft = 5.71$ (β^- from 3^+), (d,p), (d,^{3}He)
1_6^+	4323		
2_{12}^+	4348		(d,p)
1_7^+	4353		
1_8^+	4444	6 fs	
3_2^-	4468		(p,p′), (α,α'), (d,p), (t,p)

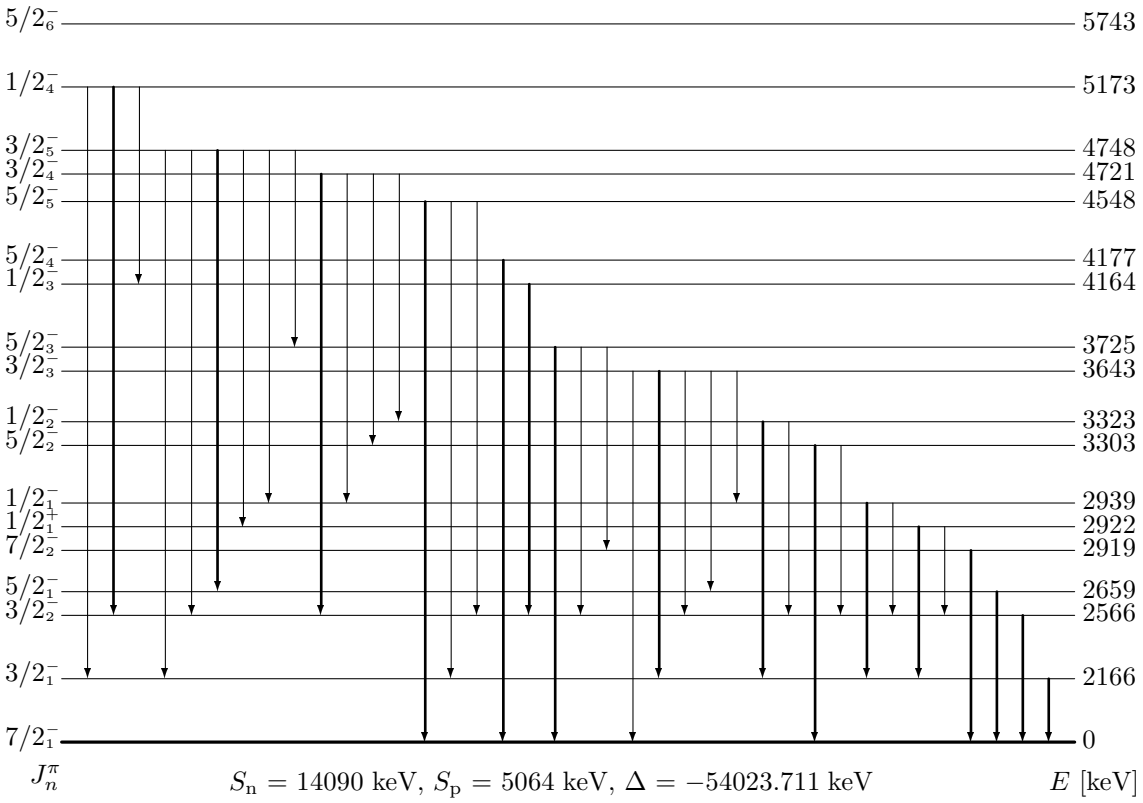
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [97B, 98B]
1_9^+	4551	21 fs	(d,p)
2_{13}^+	4620		(d,p), (t,p)
7_1^-	4669	0.38 ps	B(E2→ 5_1^-) = 9. · 10^2 W.u., B(E1/M2→ 6_2^+) = 0.0013/40 W.u. ($\delta = -0.06$), B(E1/M2→ 6_1^+) = 0.00025/10 W.u. ($\delta = -0.10$), (t,p)
1_1^-	4720		(t,p)
2_{14}^+	4890		(t,p)
2_{15}^+	4937		(d,p), (d,^{3}He), (t,p)
2_{16}^+	4992		(d,p), (t,p)
1_{10}^+	5000	3.0 fs	
5_2^-	5020		(t,p)
2_{17}^+	5060		(d,^{3}He), (t,p)
0_5^+	5138		(d,p), (t,p)
2_{18}^+	5213		(d,p), (d,^{3}He), (t,p)
3_3^-	5254		(d,p), (t,p)
8_1^+	5343	0.42 ps	B(E2→ 6_2^+) = 7 W.u.
0_6^+	5406		(d,p), (t,p)
0_7^+	5523		(d,p), (t,p)
0_8^+	5620		(d,p), (t,p)
2_{19}^+	5655		(d,p), (d,^{3}He), (t,p)
2_{20}^+	5734		(d,p), (t,p)
0_9^+	5830		(t,p)
9_1^-	5832	0.40 ps	B(E2→ 7_1^-) = 50 W.u.
2_{21}^+	6146		(d,p), (t,p)
1_2^-	6436		(d,p), (t,p)
0_{10}^+	6450		(d,p), (t,p)
0_{11}^+	6650		(t,p)
0_{12}^+	6760		(t,p)
1_3^-	6909		(d,p), (t,p)
2_{22}^+	6953		(d,p), (t,p)
0_{13}^+	7124		(d,p), (t,p)
1_4^-	7166		(d,p), (t,p)
11_1^-	7730	<0.14 ps	B(E2→ 9_1^-) > 12 W.u.



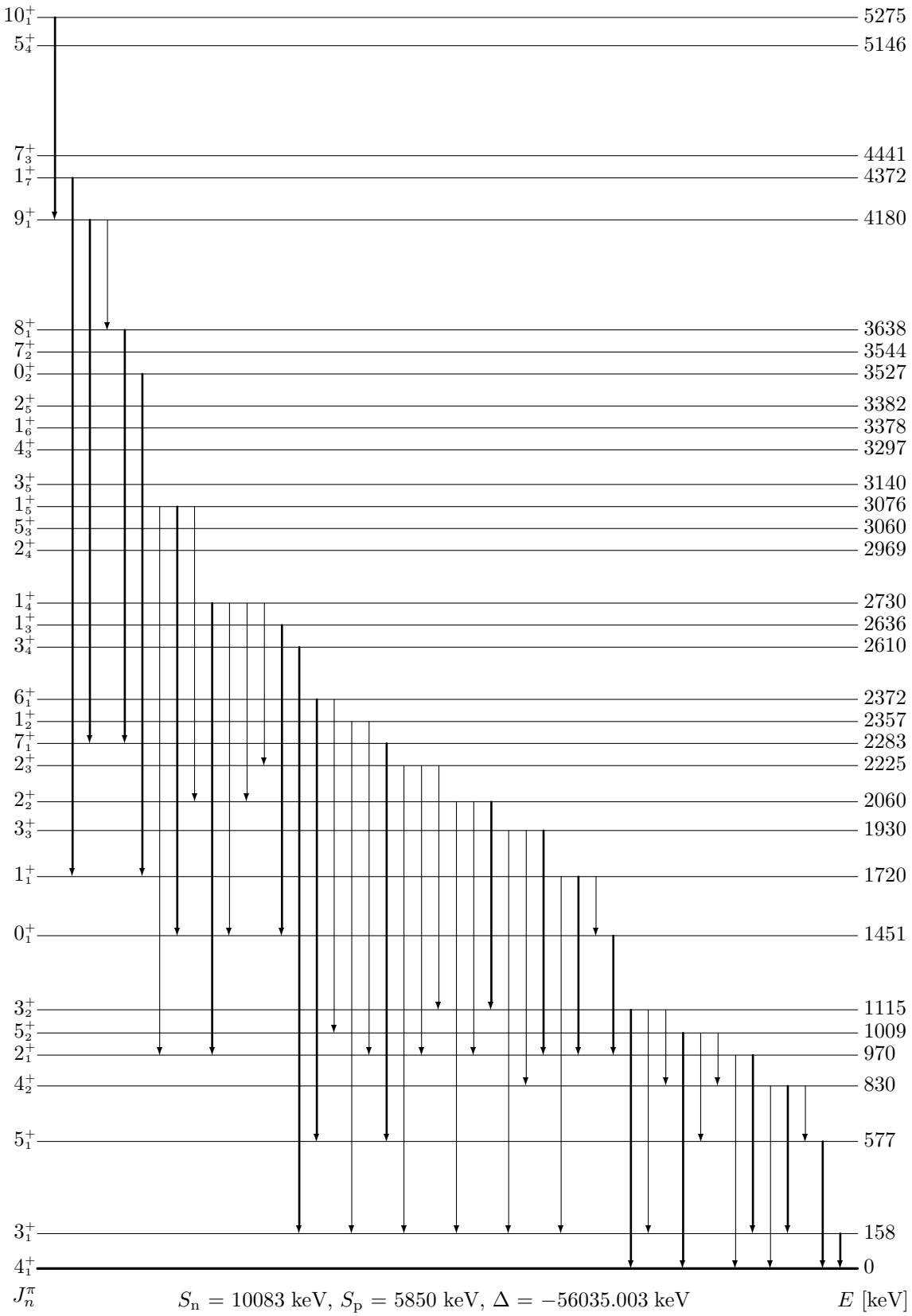
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93B5, 98B]
3/2$_1^-$	0	44.503 d	$\mu = 0.29\ \mu_n$, (t,p), (d,p)
1/2$_1^-$	287		log ft = 6.40 (β^- from 3/2$^-$), (t,p), (d,p)
5/2$_1^-$	473		log ft = 5.10 (β^- from 3/2$^-$), (t,p), (d,p)
5/2$_2^-$	571		log ft = 5.40 (β^- from 3/2$^-$), (t,p), (d,p)
3/2$_2^-$	726		log ft = 4.80 (β^- from 3/2$^-$), (t,p), (d,p)
7/2$_1^-$	1023		(t,p), (d,p)
3/2$_3^-$	1162		log ft = 5.10 (β^- from 3/2$^-$), (t,p), (d,p)
1/2$_2^-$	1211		(t,p), (d,p)
9/2$_1^+$	1517	145 ps	B(E1→ 7/2$_1^-$) = 2.6 · 10^{-5} W.u., (t,p), (d,p)
5/2$_3^-$	1570		(t,p), (d,p)
5/2$_1^+$	1648		(t,p), (d,p)
1/2$_3^-$	1962		(t,p), (d,p)
3/2$_4^-$	2570		(t,p)
1/2$_4^-$	2810		(t,p), (d,p)
1/2$_5^-$	2856		(t,p), (d,p)
3/2$_5^-$	3071		(t,p), (d,p)
3/2$_6^-$	3104		(t,p), (d,p)
3/2$_7^-$	3160		(t,p), (d,p)
3/2$_8^-$	3385		(t,p), (d,p)



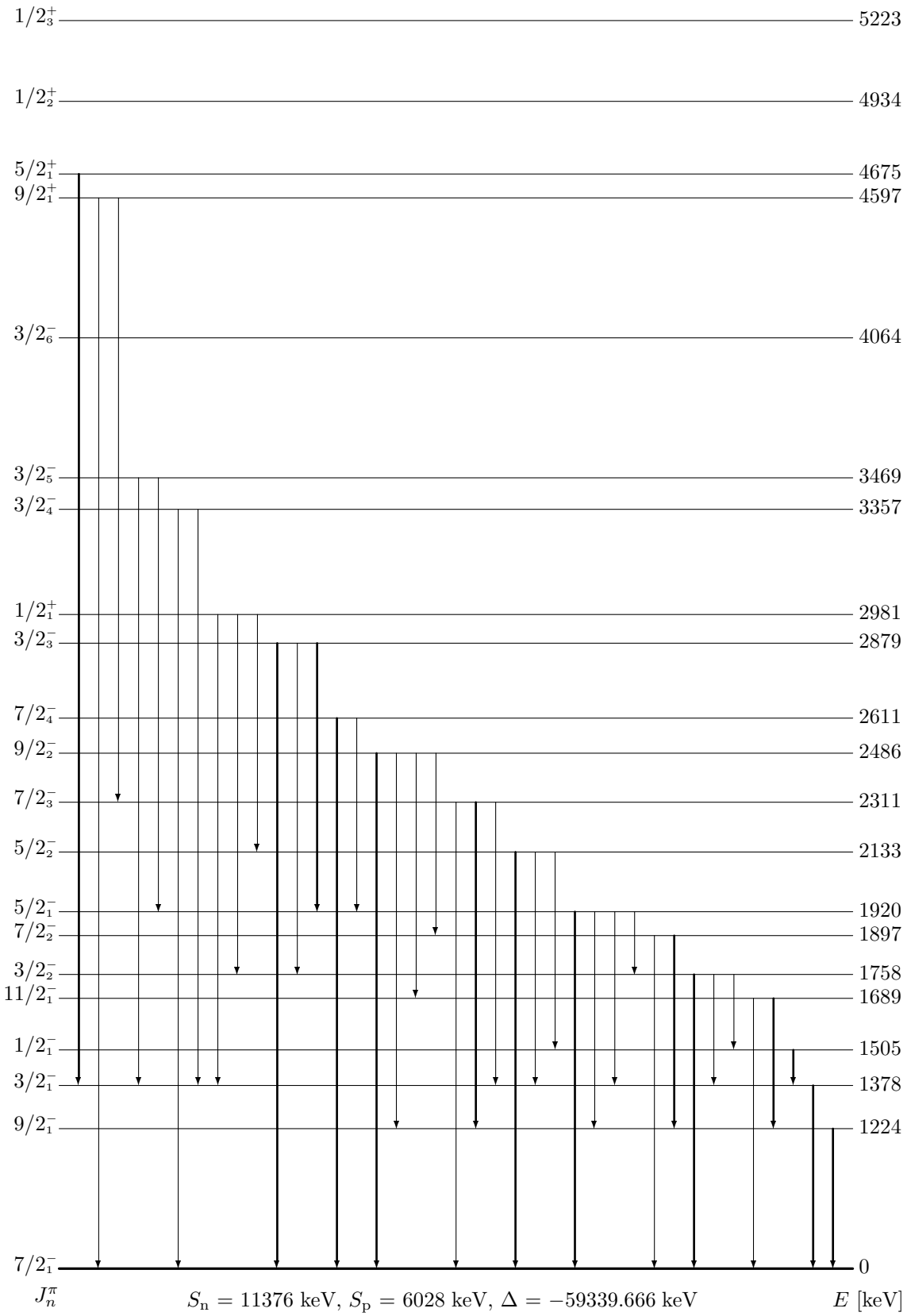
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93K1, 98B]
0_1^+	0	1.5·10^6 y	log ft = 6.70 (β^- from 0^+), (t,p), (α,^{2}He)
2_1^+	824	8.0 ps	log ft = 6.50 (β^- from 3^+), (t,p)
0_2^+	1974		(t,p)
4_1^+	2115	0.83 ps	log ft = 5.74 (β^- from 3^+), (t,p)
2_2^+	2299		log ft = 5.83 (β^- from 3^+), (t,p)
0_3^+	2358		(t,p)
2_3^+	2673		(t,p)
2_4^+	2756		(t,p)
2_5^+	3039		(t,p)
4_2^+	3072		(t,p), (α,^{2}He)
3_1^-	3293		(t,p)
4_3^+	3502		(t,p)
2_6^+	3635		(t,p)
0_4^+	3698		(t,p)
3_2^-	3867		(t,p)
2_7^+	3929		(t,p)
3_3^-	4053		(t,p)
2_8^+	4176		(t,p)
3_4^-	4280		(t,p)
7_1^-	4350		(α,^{2}He)
5_1^-	4359		(t,p)
3_5^-	4440		(t,p)
4_4^+	4503		(t,p)
2_9^+	4650		(t,p)
4_5^+	4958		(t,p)



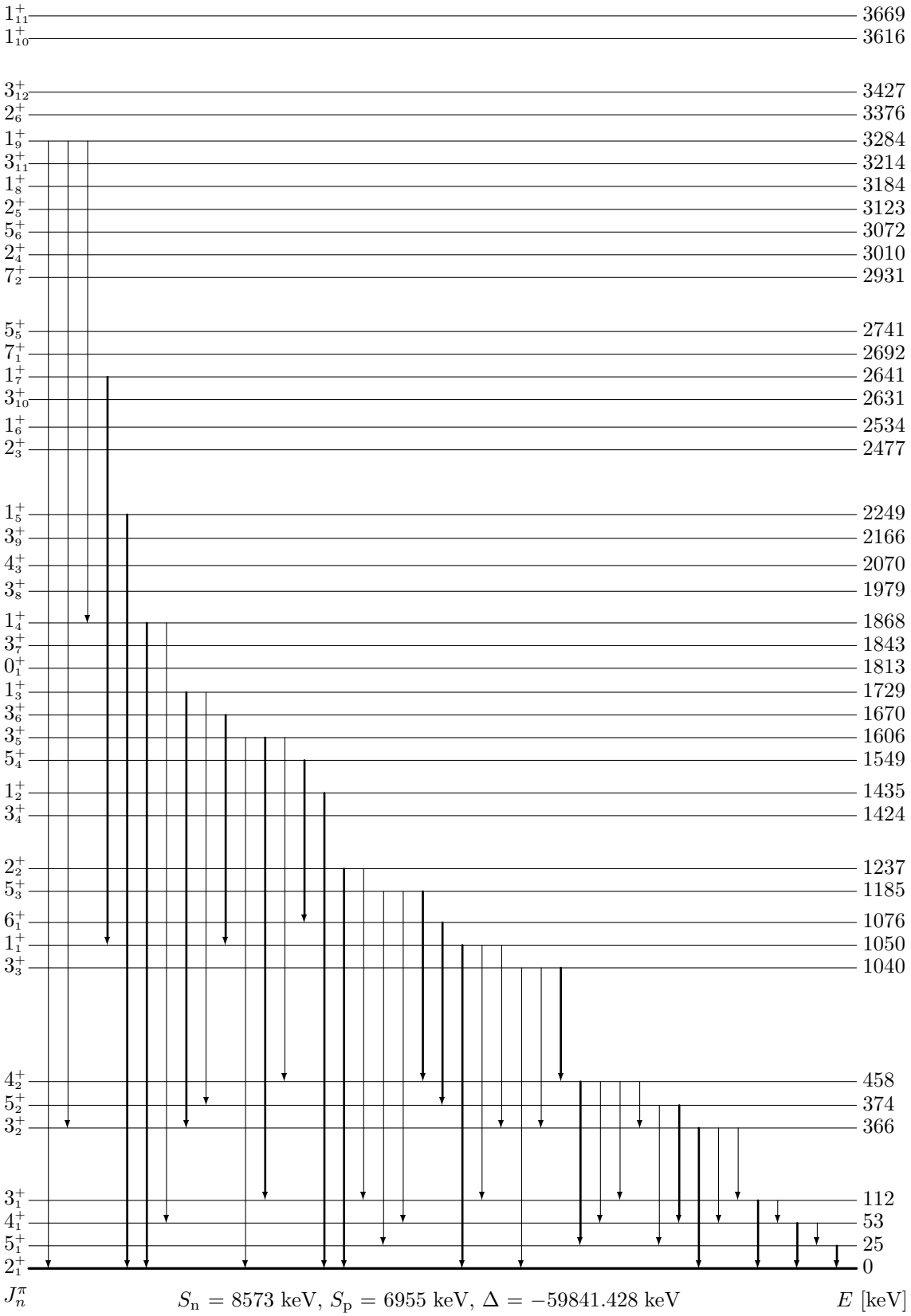
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [91J, 98B]
7/2$_1^-$	0	17.53 h	log ft = 3.60 (β^+ from 7/2$^-$), μ = 4.822 μ_n, (d,n), (p,γ), (^{3}He,d)
3/2$_1^-$	2166	98 fs	B(E2→ 7/2$_1^-$) = 9.8 W.u., (d,n), (p,γ), (^{3}He,d)
3/2$_2^-$	2566	0.39 ps	B(E2→ 7/2$_1^-$) = 1.05 W.u., (d,n), (p,γ), (^{3}He,d)
5/2$_1^-$	2659	21 fs	(d,n), (p,γ)
7/2$_2^-$	2919	47 fs	(p,γ)
1/2$_1^+$	2922	49 fs	(p,γ)
1/2$_1^-$	2939	120 fs	B(M1/E2→ 3/2$_1^-$) = 0.27/34 W.u. (δ = 0.19), B(M1→ 3/2$_2^-$) = 0.9 W.u., (d,n), (p,γ), (^{3}He,d)
5/2$_2^-$	3303	52 fs	B(M1/E2→ 7/2$_1^-$) = 0.0089/0.15 W.u. (δ = 0.30), (p,γ), (^{3}He,d)
1/2$_2^-$	3323	44 fs	B(M1→ 3/2$_2^-$) = 0.47 W.u., B(M1→ 3/2$_1^-$) = 0.17 W.u., (d,n), (p,γ), (^{3}He,d)
3/2$_3^-$	3643	240 fs	(p,γ), (^{3}He,d)
5/2$_3^-$	3725	40 fs	B(M1/E2→ 3/2$_2^-$) = 0.092/ < 0.4 W.u. (δ = −0.03), B(M1/E2→ 7/2$_1^-$) = 0.0055/0.03 W.u. (δ = 0.20), (d,n), (p,γ)
1/2$_3^-$	4164	32 fs	B(M1/E2→ 3/2$_2^-$) = 0.157/9 W.u. (δ = −0.27), (p,γ), (^{3}He,d)
5/2$_4^-$	4177	11 fs	B(M1/E2→ 7/2$_1^-$) = 0.025/0.24 W.u. (δ = 0.28), (d,n), (p,γ), (^{3}He,d)
5/2$_5^-$	4548	31 fs	B(M1/E2→ 7/2$_1^-$) = 0.0043/0.03 W.u. (δ = 0.25), (p,γ), (^{3}He,d)
3/2$_4^-$	4721	<21 fs	(p,γ), (^{3}He,d)
3/2$_5^-$	4748	21 fs	(d,n), (p,γ), (^{3}He,d)
1/2$_4^-$	5173	7 fs	(d,n), (p,γ), (^{3}He,d)
5/2$_6^-$	5743		(d,n), (^{3}He,d)


10^+_1 5275
5^+_4 5146
7^+_3 4441
1^+_7 4372
9^+_1 4180
8^+_1 3638
7^+_2 3544
0^+_2 3527
2^+_5 3382
1^+_6 3378
4^+_3 3297
3^+_5 3140
1^+_5 3076
5^+_3 3060
2^+_4 2969
1^+_4 2730
1^+_3 2636
3^+_4 2610
6^+_1 2372
1^+_2 2357
7^+_1 2283
2^+_3 2225
2^+_2 2060
3^+_3 1930
1^+_1 1720
0^+_1 1451
3^+_2 1115
5^+_2 1009
2^+_1 970
4^+_2 830
5^+_1 577
3^+_1 158
4^+_1 0
J^π_n
$S_\mathrm{n} = 10083$ keV, $S_\mathrm{p} = 5850$ keV, $\Delta = -56035.003$ keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92J, 98B]
4_1^+	0	77.27 d	log ft = 12.50 (β^+ from 0^+), Q = 0.25 barn, μ = 3.851 μ_n
3_1^+	158	<0.1 ns	B(M1/E2→ 4_1^+) > 0.055/ > 0.28 W.u. (δ = 0.016), log ft = 11.40 (β^+ from 0^+), (p,n), (^{3}He,t), (d,α), (p,^{3}He), (^{3}He,p), (α,d)
5_1^+	577	0.28 ps	B(M1/E2→ 4_1^+) = 0.40/6. · 10^{15} W.u. (δ = −0.16), (p,n), (^{3}He,t), (d,α), (p,^{3}He), (^{3}He,p), (α,d)
4_2^+	830	>1.7 ps	B(M1/E2→ 3_1^+) < 0.032/ < 4.1 W.u. (δ = −0.09), B(M1/E2→ 4_1^+) < 0.0058/ < 5.5 W.u. (δ = −0.43), (p,n), (^{3}He,t), (d,α), (p,^{3}He), (^{3}He,p), (α,d)
2_1^+	970	0.12 ps	B(M1/E2→ 3_1^+) = 0.3/ < 1.4 W.u. (δ = −0.02), log ft = 7.40 (β^+ from 0^+), (p,n), (^{3}He,t), (d,α), (p,^{3}He), (^{3}He,p), (α,d)
5_2^+	1009	0.38 ps	B(M1/E2→ 4_1^+) = 0.049/1.0 W.u. (δ = −0.10), (p,n), (^{3}He,t), (d,α), (p,^{3}He), (^{3}He,p), (α,d)
3_2^+	1115	0.19 ps	B(M1/E2→ 4_2^+) = 0.6/35 W.u. (δ = −0.05), B(M1/E2→ 3_1^+) = 0.0032/7 W.u., B(M1/E2→ 4_1^+) = 0.07/0.8 W.u. (δ = 0.085), (p,n), (^{3}He,t), (d,α), (p,^{3}He), (^{3}He,p), (α,d)
0_1^+	1451	1.58 ns	B(E2→ 2_1^+) = 1.10 W.u., log ft = 7.10 (β^+ from 0^+), (p,n), (^{3}He,t), (d,α), (p,^{3}He), (^{3}He,p)
1_1^+	1720	0.34 ps	B(M1→ 0_1^+) = 1.2 W.u., B(M1→ 2_1^+) = 0.08 W.u., B(E2→ 3_1^+) < 4.1 W.u., log ft = 4.40 (β^+ from 0^+), (p,n), (^{3}He,t), (d,α), (p,^{3}He), (^{3}He,p), (α,d)
3_3^+	1930	33 fs	(p,n), (^{3}He,t), (d,α), (p,^{3}He), (^{3}He,p), (α,d)
2_2^+	2060	24 fs	(p,n), (^{3}He,t), (d,α), (p,^{3}He), (^{3}He,p), (α,d)
2_3^+	2225		(p,n), (^{3}He,t), (d,α), (p,^{3}He), (^{3}He,p)
7_1^+	2283	>1.25 ps	B(E2→ 5_1^+) < 2.5 W.u., (^{3}He,t), (d,α), (p,^{3}He)
1_2^+	2357		(p,n), (d,α), (^{3}He,p)
6_1^+	2372	42 fs	B(M1/E2→ 5_1^+) = 0.07/ < 0.17 W.u. (δ = 0.03), (d,α), (p,^{3}He), (α,d)
3_4^+	2610		(p,n), (d,α)
1_3^+	2636	14 fs	(p,n), (^{3}He,t), (d,α), (p,^{3}He), (^{3}He,p)
1_4^+	2730	69 fs	(p,n), (^{3}He,t), (d,α), (p,^{3}He), (^{3}He,p), (α,d)
2_4^+	2969		(^{3}He,t), (d,α), (^{3}He,p)
5_3^+	3060		(^{3}He,t), (d,α)
1_5^+	3076	22 fs	(d,α), (^{3}He,p), (α,d)
3_5^+	3140		(d,α), (p,^{3}He)
4_3^+	3297		(d,α)
1_6^+	3378		(^{3}He,p)
2_5^+	3382		(d,α), (p,^{3}He)
0_2^+	3527	6 fs	(d,α), (^{3}He,p)
7_2^+	3544		(^{3}He,t), (d,α)
8_1^+	3638	55 fs	B(M1/E2→ 7_1^+) = 0.16/4 W.u. (δ = 0.15)
9_1^+	4180	0.41 ps	B(M1/E2→ 8_1^+) = 0.091/ < 8 W.u. (δ = 0.05), B(E2→ 7_1^+) = 3.2 W.u., (d,α), (^{3}He,p)
1_7^+	4372	10 fs	(^{3}He,p)
7_3^+	4441		(d,α), (^{3}He,p)
5_4^+	5146		(d,α)
10_1^+	5275	42 fs	B(M1/E2→ 9_1^+) = 0.4/12 W.u. (δ = 0.13)


1/2+3 5223
1/2+2 4934
5/2+1 4675
9/2+1 4597
3/2−6 4064
3/2−5 3469
3/2−4 3357
1/2+1 2981
3/2−3 2879
7/2−4 2611
9/2−2 2486
7/2−3 2311
5/2−2 2133
5/2−1 1920
7/2−2 1897
3/2−2 1758
11/2−1 1689
1/2−1 1505
3/2−1 1378
9/2−1 1224
7/2−1 0
J^π_n
S_n = 11376 keV, S_p = 6028 keV, Δ = −59339.666 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92B3, 98B]
$7/2_1^-$	0	271.79 d	$Q = 0.52$ barn, $\mu = 4.720\ \mu_n$, (^{3}He,t), (d,n), (d,^{3}He), (t,α), (^{3}He,d), (p,t)
$9/2_1^-$	1224	54 fs	B(M1/E2$\rightarrow$ $7/2_1^-$) = 0.208/18.5 W.u. (δ = 0.26), (d,^{3}He), (t,α), (^{3}He,d)
$3/2_1^-$	1378	19 ps	B(E2$\rightarrow$ $7/2_1^-$) = 0.46 W.u., log ft = 5.64 (β^+ from $3/2^-$), $Q = 0.22$ barn, $\mu = 3.0\ \mu_n$, (d,n), (d,^{3}He), (t,α), (^{3}He,d)
$1/2_1^-$	1505	0.21 ns	B(M1/E2$\rightarrow$ $3/2_1^-$) = 0.050/0.4 W.u. (δ = 0.008), log ft = 6.05 (β^+ from $3/2^-$), (d,n), (d,^{3}He), (^{3}He,d)
$11/2_1^-$	1689	0.24 ps	B(M1/E2$\rightarrow$ $9/2_1^-$) = 0.49/28 W.u. (δ = 0.08), B(E2$\rightarrow$ $7/2_1^-$) = 6.0 W.u., (d,^{3}He), (t,α)
$3/2_2^-$	1758	0.27 ps	B(E2$\rightarrow$ $7/2_1^-$) = 9.4 W.u., log ft = 6.22 (β^+ from $3/2^-$), (d,n), (d,^{3}He), (t,α), (^{3}He,d)
$7/2_2^-$	1897	110 fs	B(M1/E2$\rightarrow$ $9/2_1^-$) = 0.35/0.6 W.u. (δ = 0.02), B(M1/E2$\rightarrow$ $7/2_1^-$) = 0.0136/0.01 W.u. (δ = -0.04), (d,^{3}He), (t,α), (^{3}He,d), (p,t)
$5/2_1^-$	1920	22 fs	B(M1/E2$\rightarrow$ $7/2_1^-$) = 0.134/3.8 W.u. (δ = -0.23), B(M1$\rightarrow$ $3/2_2^-$) = 0.47 W.u., log ft = 5.74 (β^+ from $3/2^-$), (^{3}He,d)
$5/2_2^-$	2133	0.34 ps	B(M1/E2$\rightarrow$ $3/2_1^-$) = 0.016/7 W.u. (δ = -0.35), B(E2$\rightarrow$ $1/2_1^-$) = 36 W.u., B(M1$\rightarrow$ $7/2_1^-$) = 0.0047 W.u., log ft = 8.13 (β^+ from $3/2^-$), (d,n), (d,^{3}He), (t,α), (^{3}He,d)
$7/2_3^-$	2311	0.21 ps	B(M1/E2$\rightarrow$ $9/2_1^-$) = 0.056/1.6 W.u. (δ = 0.13), B(M1/E2$\rightarrow$ $7/2_1^-$) = 0.0015/0.09 W.u. (δ = -0.4), B(E2$\rightarrow$ $3/2_1^-$) = 29 W.u., (d,n), (d,^{3}He), (t,α), (^{3}He,d), (p,t)
$9/2_2^-$	2486	59 fs	B(M1/E2$\rightarrow$ $11/2_1^-$) = $0.043/1.4 \cdot 10^2$ W.u., B(M1/E2$\rightarrow$ $9/2_1^-$) = 0.011/14 W.u., B(M1/E2$\rightarrow$ $7/2_1^-$) = 0.0079/2.5 W.u., B(M1$\rightarrow$ $7/2_2^-$) = 0.20 W.u., (d,^{3}He), (t,α)
$7/2_4^-$	2611	85 fs	(d,^{3}He), (t,α), (p,t)
$3/2_3^-$	2879	111 fs	B(E2$\rightarrow$ $7/2_1^-$) = 0.79 W.u., (d,n), (d,^{3}He), (^{3}He,d)
$1/2_1^+$	2981		(d,^{3}He), (t,α), (^{3}He,d)
$3/2_4^-$	3357		(d,n)
$3/2_5^-$	3469		(d,n), (d,^{3}He), (^{3}He,d)
$3/2_6^-$	4064		(^{3}He,d)
$9/2_1^+$	4597		(^{3}He,d)
$5/2_1^+$	4675		(^{3}He,d)
$1/2_2^+$	4934		(^{3}He,d)
$1/2_3^+$	5223		(^{3}He,d)
$3/2_7^-$	7254		
$3/2_8^-$	7267		(^{3}He,d)
$3/2_9^-$	7272		(^{3}He,t), (^{3}He,d)
$3/2_{10}^-$	7598		
$3/2_{11}^-$	7622		
$3/2_{12}^-$	7642		
$3/2_{13}^-$	7648		
$9/2_2^+$	9682		
$9/2_3^+$	9689		
$5/2_2^+$	9735		
$5/2_3^+$	9755		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3^+_{12} 3427
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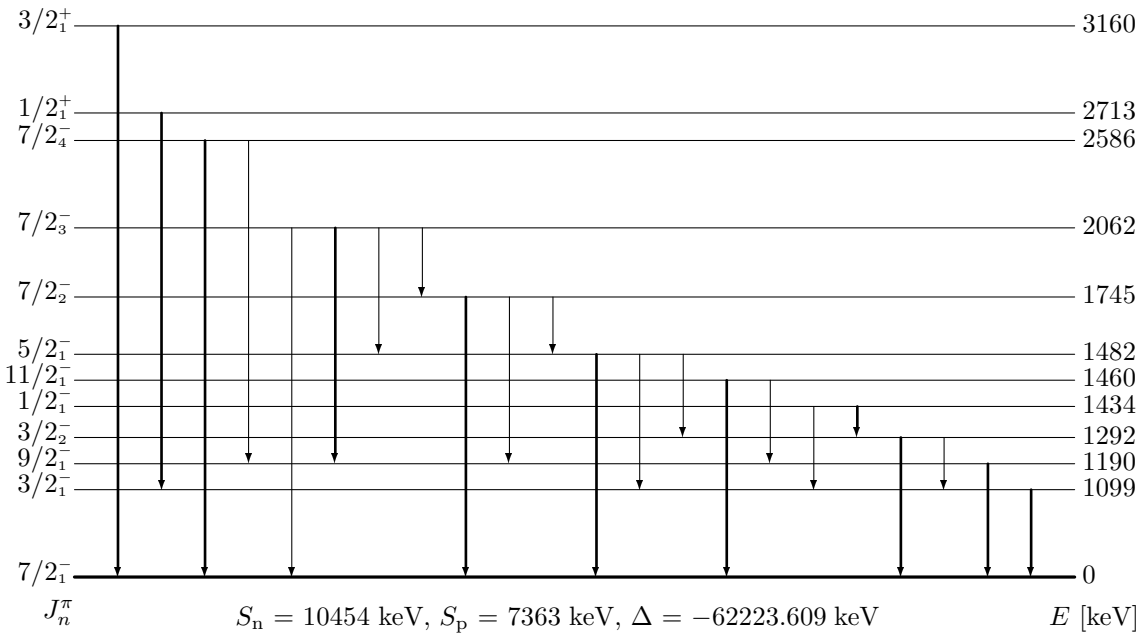
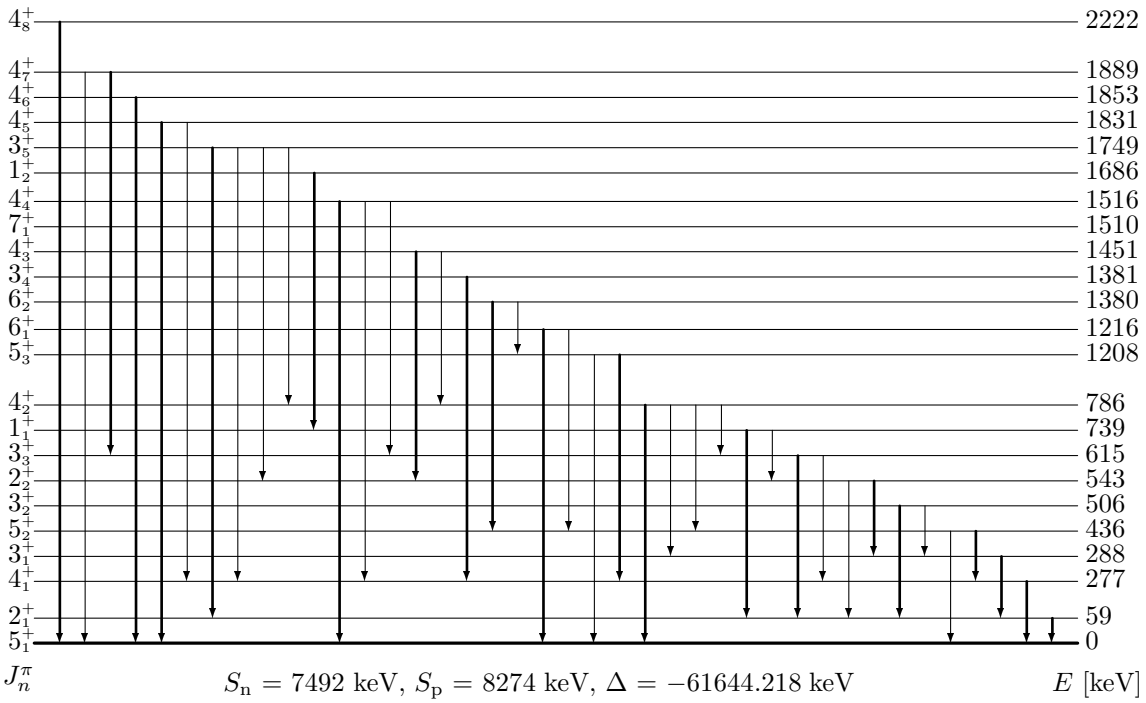
1^+_9 3284
3^+_{11} 3214
1^+_8 3184
2^+_5 3123
5^+_6 3072
2^+_4 3010
7^+_2 2931
5^+_5 2741
7^+_1 2692
1^+_7 2641
3^+_{10} 2631
1^+_6 2534
2^+_3 2477
1^+_5 2249
3^+_9 2166
4^+_3 2070
3^+_8 1979
1^+_4 1868
3^+_7 1843
0^+_1 1813
1^+_3 1729
3^+_6 1670
3^+_5 1606
5^+_4 1549
1^+_2 1435
3^+_4 1424
2^+_2 1237
5^+_3 1185
6^+_1 1076
1^+_1 1050
3^+_3 1040
4^+_2 458
5^+_2 374
3^+_2 366
3^+_1 112
4^+_1 53
5^+_1 25
2^+_1 0
J^π_n
S_n = 8573 keV, S_p = 6955 keV, Δ = −59841.428 keV
E [keV]

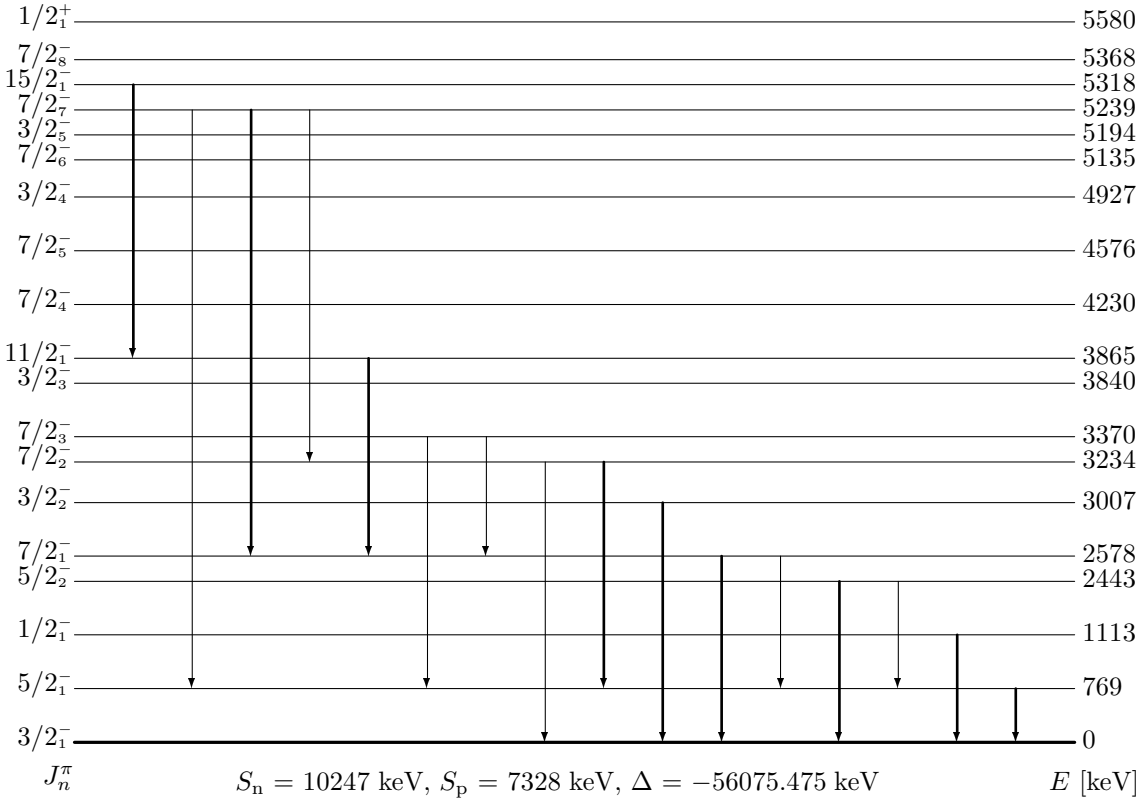
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [97B, 98B]
2_1^+	0	70.86 d	$Q = 0.22$ barn, $\mu = 4.044\ \mu_n$
5_1^+	25	9.04 h	B(M3→ 2_1^+) = 0.599 W.u., (p,n), (t,^{3}He), (d,t), (d,n), (^{3}He,α), (d,α), (α,d), (^{3}He,p)
4_1^+	53	10.4 μs	(p,n), (t,^{3}He), (d,t), (d,n), (^{3}He,d), (^{3}He,α), (d,α)
3_1^+	112	0.18 ns	B(M1/E2→ 4_1^+) = 0.22/ < 80 W.u. ($\delta = -0.02$), B(M1/E2→ 2_1^+) = 0.050/ < 10 W.u. ($\delta = -0.02$), $\mu = 2.2\ \mu_n$, (p,n), (t,^{3}He), (p,d), (d,t), (^{3}He,d), (^{3}He,α), (d,α)
3_2^+	366	1.2 ps	B(M1/E2→ 2_1^+) = 0.37/ < 7 W.u. ($\delta = -0.018$), (p,n), (t,^{3}He), (p,d), (d,t), (^{3}He,d), (^{3}He,α), (d,α), (^{3}He,p)
5_2^+	374	0.6 ps	B(M1/E2→ 4_1^+) = 1.0/5. · 10^1 W.u. ($\delta = -0.050$), (p,n), (t,^{3}He), (d,t), (^{3}He,d), (d,α), (α,d)
4_2^+	458	0.9 ps	B(M1/E2→ 5_1^+) = 0.25/30 W.u. ($\delta = -0.109$), (p,n), (t,^{3}He), (p,d), (d,t), (^{3}He,α), (d,α)
3_3^+	1040	0.14 ps	B(M1/E2→ 4_2^+) = 0.37/ < 6 W.u. ($\delta = -0.02$), (p,n), (t,^{3}He), (p,d), (^{3}He,d), (^{3}He,α), (d,α)
1_1^+	1050	0.14 ps	(p,n), (t,^{3}He), (^{3}He,d), (^{3}He,α), (^{3}He,p)
6_1^+	1076		(t,^{3}He), (d,t), (^{3}He,α), (d,α), (α,d)
5_3^+	1185	0.14 ps	(p,n), (t,^{3}He), (^{3}He,α), (d,α)
2_2^+	1237		(p,n), (t,^{3}He), (^{3}He,d), (^{3}He,α), (d,α), (^{3}He,p)
3_4^+	1424		(t,^{3}He)
1_2^+	1435	0.6 ps	B(M1→ 2_1^+) = 0.013 W.u., (p,n), (t,^{3}He), (^{3}He,d), (d,α), (α,d), (^{3}He,p)
5_4^+	1549		(p,n), (t,^{3}He), (^{3}He,α), (d,α)
3_5^+	1606		(p,n), (t,^{3}He), (^{3}He,d), (d,α), (α,d), (^{3}He,p)
3_6^+	1670		(p,n), (t,^{3}He), (^{3}He,d), (d,α), (^{3}He,p)
1_3^+	1729		(p,n), (t,^{3}He), (^{3}He,d), (^{3}He,α), (d,α), (α,d), (^{3}He,p)
0_1^+	1813		(p,n), (^{3}He,d), (^{3}He,α), (^{3}He,p)
3_7^+	1843		(p,n), (t,^{3}He), (d,α)
1_4^+	1868		(p,n), (t,^{3}He), (^{3}He,d), (d,α), (α,d), (^{3}He,p)
3_8^+	1979		(p,n), (t,^{3}He), (^{3}He,d), (d,α), (α,d), (^{3}He,p)
4_3^+	2070		(p,n), (t,^{3}He), (^{3}He,d), (^{3}He,α), (d,α)
3_9^+	2166		(p,n), (^{3}He,d), (^{3}He,α), (d,α)
1_5^+	2249		(p,n), (t,^{3}He), (^{3}He,d), (^{3}He,α), (d,α), (α,d), (^{3}He,p)
2_3^+	2477		(t,^{3}He), (^{3}He,d), (^{3}He,α)
1_6^+	2534		(t,^{3}He), (^{3}He,d), (^{3}He,α), (d,α), (^{3}He,p)
3_{10}^+	2631		(t,^{3}He), (^{3}He,α), (d,α)
1_7^+	2641		(p,n), (^{3}He,p)
7_1^+	2692		(^{3}He,α), (d,α), (α,d)
5_5^+	2741		(t,^{3}He), (^{3}He,α), (^{3}He,p)
7_2^+	2931		(d,α)
2_4^+	3010		(t,^{3}He), (^{3}He,d), (^{3}He,α), (d,α)
5_6^+	3072		(t,^{3}He), (^{3}He,α), (d,α)
2_5^+	3123		(^{3}He,d), (^{3}He,α)
1_8^+	3184		(d,α)
3_{11}^+	3214		(t,^{3}He), (^{3}He,α), (d,α)
1_9^+	3284		(p,n), (t,^{3}He), (^{3}He,α), (d,α), (^{3}He,p)
2_6^+	3376		(^{3}He,d)
3_{12}^+	3427		(t,^{3}He), (^{3}He,α), (d,α), (^{3}He,p)
1_{10}^+	3616		(t,^{3}He), (^{3}He,d), (^{3}He,p)
1_{11}^+	3669		(t,^{3}He), (^{3}He,d), (^{3}He,p)



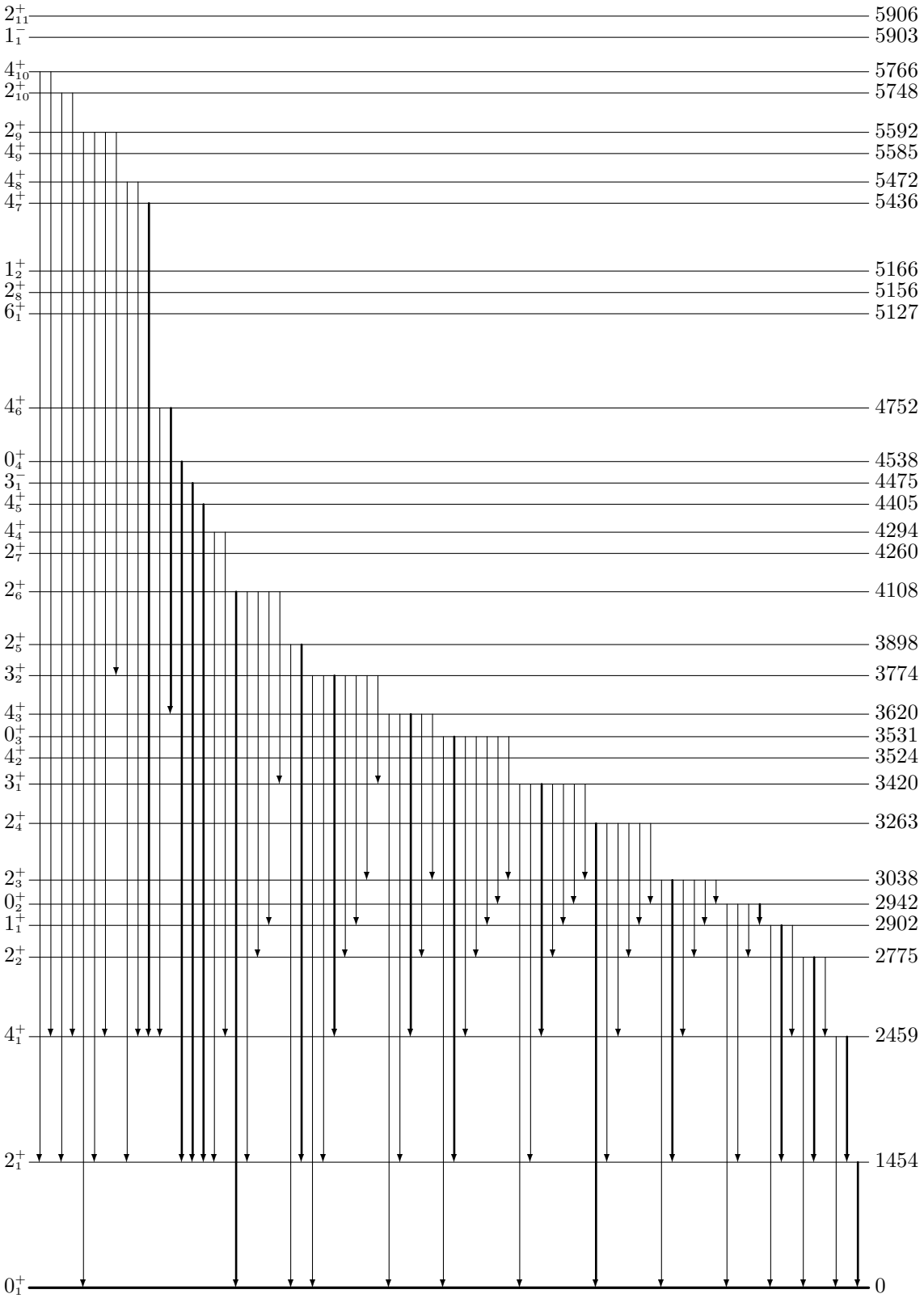
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93B5, 98B]
$7/2_1^-$	0	stable	log ft = 11.14 (β^- from $3/2^-$), log ft = 11.90 (β^+ from $3/2^-$), Q = 0.40 barn, μ = 4.627 μ_n
$3/2_1^-$	1099	3.1 ps	B(E2→ $7/2_1^-$) = 8.3 W.u., log ft = 6.70 (β^- from $3/2^-$), (γ,γ'), Coul. ex., (p,p′), (d,d′), (p,γ), (^{3}He,d), (t,α)
$9/2_1^-$	1190	52 fs	B(M1/E2→ $7/2_1^-$) = 0.242/13 W.u. (δ = 0.20), (γ,γ'), Coul. ex., (p,p′), (d,d′), (α,α'), (p,γ), (t,α)
$3/2_2^-$	1292	551 ps	B(M1/E2→ $3/2_1^-$) = 0.000356/0.81 W.u. (δ = 0.211), B(E2→ $7/2_1^-$) = 0.0195 W.u., log ft = 5.98 (β^- from $3/2^-$), μ = 2.54 μ_n, Coul. ex., (e,e′), (p,p′), (d,d′), (p,γ), (^{3}He,d), (t,α)
$1/2_1^-$	1434	210 ps	B(M1/E2→ $3/2_2^-$) = 0.028/7 W.u. (δ = −0.009), B(M1/E2→ $3/2_1^-$) = 0.00013/7.6 W.u. (δ = 1.9), log ft = 6.48 (β^- from $3/2^-$), (p,p′), (p,γ), (^{3}He,d)
$11/2_1^-$	1460	1.07 ps	B(E2→ $7/2_1^-$) = 5.4 W.u., (γ,γ'), Coul. ex., (p,p′), (d,d′), (α,α'), (p,γ), (t,α)
$5/2_1^-$	1482	166 fs	B(M1/E2→ $3/2_1^-$) = 0.53/ < 300 W.u. (δ = 0.21), B(M1/E2→ $7/2_1^-$) = 0.030/0.9 W.u. (δ = −0.19), log ft = 7.09 (β^- from $3/2^-$), (γ,γ'), Coul. ex., (p,p′), (d,d′), (p,γ)
$7/2_2^-$	1745	0.32 ps	B(M1/E2→ $5/2_1^-$) = 0.40/ < 61 W.u. (δ = 0.02), B(M1/E2→ $9/2_1^-$) = 0.14/ < 0.8 W.u. (δ = 0.01), B(M1/E2→ $7/2_1^-$) = 0.0041/1.9 W.u. (δ = −0.87), (γ,γ'), Coul. ex., (p,p′), (d,d′), (p,γ), (t,α)
$7/2_3^-$	2062	0.13 ps	B(M1/E2→ $5/2_1^-$) = 0.34/ < 300. W.u. (δ = 0.21), B(M1/E2→ $9/2_1^-$) = 0.12/ < 11 W.u. (δ = 0.12), (p,p′), (d,d′), (p,γ), (^{3}He,d), (t,α)
$7/2_4^-$	2586	68 fs	(p,p′), (t,α)
$1/2_1^+$	2713		(p,p′), (p,γ), (t,α)
$3/2_1^+$	3160		(p,p′), (d,d′), (t,α)



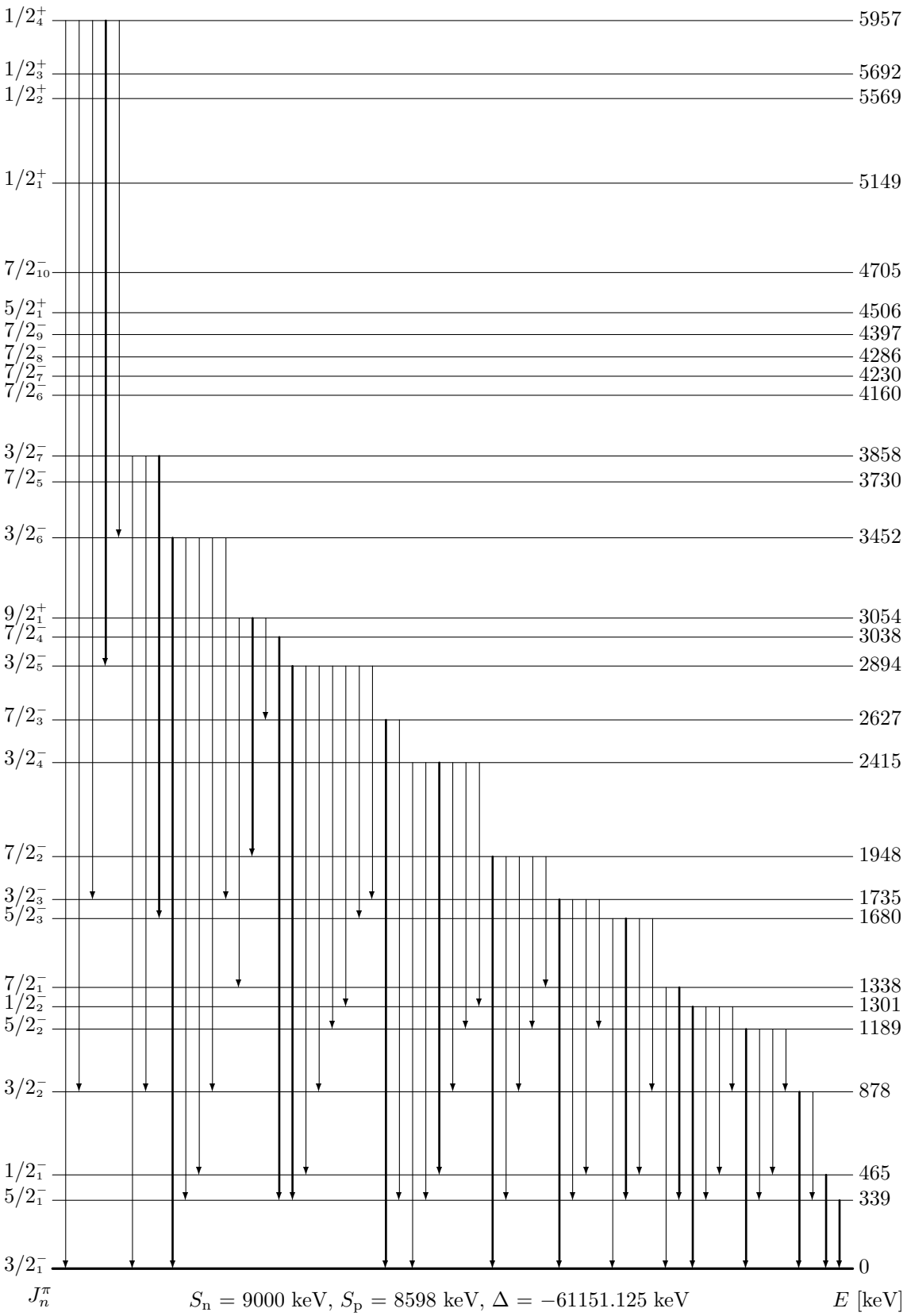
J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93K1, 98B]
5^+_1	0	5.2714 y	Q = 0.44 barn, μ = 3.799 μ_n, (d,p), (d,^{3}He), (d,α), (^{3}He,p)
2^+_1	59	10.467 m	B(M3→ 5^+_1) = 3.88 W.u., log ft = 12.10 (β^- from 0^+), (d,p), (d,^{3}He), (d,α), (^{3}He,p)
4^+_1	277		(d,p), (d,α)
3^+_1	288		(d,p), (d,^{3}He), (d,α), (^{3}He,p)
5^+_2	436		(d,p), (d,^{3}He), (d,α), (^{3}He,p)
3^+_2	506		(d,p), (d,^{3}He), (d,α), (^{3}He,p)
2^+_2	543		(d,p), (d,^{3}He), (d,α), (^{3}He,p)
3^+_3	615		(d,p), (d,^{3}He), (d,α), (^{3}He,p)
1^+_1	739		(d,p), (d,α), (^{3}He,p)
4^+_2	786	<3.2 ps	(d,p), (d,^{3}He), (d,α), (^{3}He,p)
5^+_3	1208		(d,p)
6^+_1	1216	0.28 ps	(d,p), (d,α), (^{3}He,p)
6^+_2	1380	0.7 ps	(d,p), (d,α), (^{3}He,p)
3^+_4	1381		(d,p), (d,α)
4^+_3	1451		(d,p)
7^+_1	1510		(d,α)
4^+_4	1516		(d,p)
1^+_2	1686		(^{3}He,p)
3^+_5	1749		(d,p)
4^+_5	1831		(d,p)
4^+_6	1853		(d,p)
4^+_7	1889		(d,p), (d,α), (^{3}He,p)
4^+_8	2222		(d,p), (d,α), (^{3}He,p)



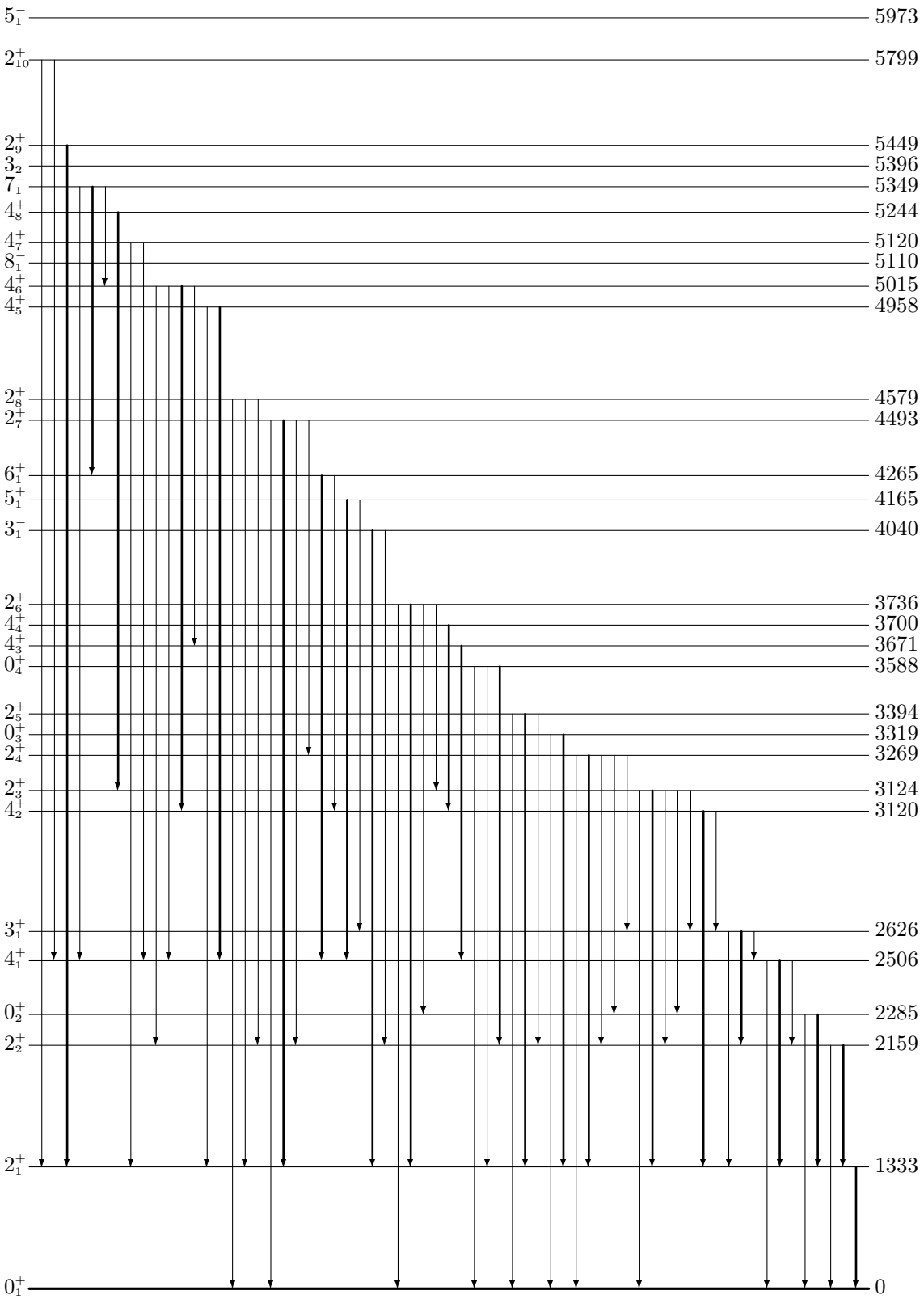
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92B3, 98B]
$3/2^-_1$	0	35.60 h	log ft = 3.70 (β^+ from $3/2^-$), μ = 0.88 μ_n
$5/2^-_1$	769	3.2 ps	B(M1/E2→ $3/2^-_1$) = 0.0144/2.5 W.u. (δ = 0.23), (p,d), (d,t), (^{3}He,α), (p,t)
$1/2^-_1$	1113	106 fs	B(M1/E2→ $3/2^-_1$) < 0.19/ < 3.0 · 10^2 W.u., log ft = 4.80 (β^+ from $3/2^-$), (p,d), (d,t), (p,t)
$5/2^-_2$	2443	31 fs	B(M1/E2→ $3/2^-_1$) < 0.024/0.049 W.u. (δ = 0.8), (p,d), (d,t), (p,t)
$7/2^-_1$	2578	47 fs	B(E2→ $3/2^-_1$) = 7.7 W.u., (p,d), (d,t), (^{3}He,α), (p,t)
$3/2^-_2$	3007	12 fs	B(M1/E2→ $3/2^-_1$) < 0.13/ < 27 W.u., (p,t)
$7/2^-_2$	3234		(p,d), (d,t), (^{3}He,α), (p,t)
$7/2^-_3$	3370		(p,d), (d,t), (p,t)
$3/2^-_3$	3840		(p,d), (d,t)
$11/2^-_1$	3865	0.29 ps	B(E2→ $7/2^-_1$) = 42 W.u., (p,t)
$7/2^-_4$	4230		(p,d), (d,t), (^{3}He,α), (p,t)
$7/2^-_5$	4576		(p,d), (d,t), (p,t)
$3/2^-_4$	4927		(p,d), (d,t), (p,t)
$7/2^-_6$	5135		(p,d), (d,t), (p,t)
$3/2^-_5$	5194		(p,d), (d,t), (p,t)
$7/2^-_7$	5239		(p,d), (d,t), (^{3}He,α), (p,t)
$15/2^-_1$	5318	0.64 ps	B(E2→ $11/2^-_1$) = 10 W.u.
$7/2^-_8$	5368		(p,d), (d,t), (p,t)
$1/2^+_1$	5580		(p,d), (d,t)


2^+_{11} 5906
1^-_1 5903
4^+_{10} 5766
2^+_{10} 5748
2^+_9 5592
4^+_9 5585
4^+_8 5472
4^+_7 5436
1^+_2 5166
2^+_8 5156
6^+_1 5127
4^+_6 4752
0^+_4 4538
3^-_1 4475
4^+_5 4405
4^+_4 4294
2^+_7 4260
2^+_6 4108
2^+_5 3898
3^+_2 3774
4^+_3 3620
0^+_3 3531
4^+_2 3524
3^+_1 3420
2^+_4 3263
2^+_3 3038
0^+_2 2942
1^+_1 2902
2^+_2 2775
4^+_1 2459
2^+_1 1454
0^+_1 0
J^π_n
$S_\mathrm{n} = 12219$ keV, $S_\mathrm{p} = 8172$ keV, $\Delta = -60223.014$ keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [97B, 98B]
0_1^+	0	stable	log ft = 4.87 (β^+ from 1^+), (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (p,t)
2_1^+	1454	667 fs	B(E2→ 0_1^+) = 9.8 W.u., log ft = 6.20 (β^+ from 1^+), Q = −0.10 barn, μ = −0.12 μ_n, (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (p,t)
4_1^+	2459	>970 fs	B(E2→ 2_1^+) < 43 W.u., (e,e′), (p,p′), (d,d′), (α,α'), (p,t)
2_2^+	2775	0.38 ps	B(M1/E2→ 2_1^+) = 0.011/15 W.u. (δ = −1.1), B(E2→ 0_1^+) = 0.029 W.u., (e,e′), (p,p′), (d,d′), (α,α'), (p,t)
1_1^+	2902	69 fs	log ft = 5.16 (β^+ from 1^+), (p,p′), (α,α')
0_2^+	2942	2.01 ns	B(M1→ 1_1^+) = 0.084 W.u., B(E2→ 2_2^+) = 14.9 W.u., (e,e′), (p,p′), B(E2→ 2_1^+) = 0.00029 W.u., log ft = 4.79 (β^+ from 1^+), (α,α'), (p,t)
2_3^+	3038	52 fs	B(M1/E2→ 2_2^+) = 0.23/6 W.u. (δ = −0.03), B(M1/E2→ 2_1^+) = 0.060/2.0 W.u. (δ = 0.21), log ft = 6.25 (β^+ from 1^+), (γ,γ'), (e,e′), (p,p′), (d,d′), (α,α'), (p,t)
2_4^+	3263	35 fs	B(M1/E2→ 2_1^+) = 0.028/8 W.u. (δ = 0.7), log ft = 5.59 (β^+ from 1^+), (γ,γ'), (e,e′), (p,p′), (d,d′), (α,α'), (p,t)
3_1^+	3420	0.26 ps	B(M1/E2→ 4_1^+) = 0.09/0.07 W.u. (δ = −0.02), (p,p′), (α,α'), (p,t)
4_2^+	3524		(d,d′), (α,α')
0_3^+	3531	0.19 ps	B(E2→ 2_1^+) = 5.5 W.u., log ft = 6.67 (β^+ from 1^+), (e,e′), (p,p′)
4_3^+	3620	0.11 ps	B(M1/E2→ 4_1^+) = 0.07/44 W.u. (δ = 0.6), B(E2→ 2_1^+) = 1.4 W.u., (e,e′), (p,p′), (α,α'), (p,t)
3_2^+	3774	0.28 ps	B(M1/E2→ 3_1^+) = 0.33/1. · 10^1 W.u. (δ = 0.05), B(M1/E2→ 4_1^+) = 0.019/0.8 W.u. (δ = 0.19), (p,p′), (α,α'), (p,t)
2_5^+	3898	27 fs	B(M1→ 2_1^+) = 0.042 W.u., B(E2→ 0_1^+) = 0.42 W.u., log ft = 6.20 (β^+ from 1^+), (γ,γ'), (e,e′), (p,p′), (d,d′), (α,α'), (p,t)
2_6^+	4108	110 fs	B(M1/E2→ 2_1^+) = 0.0032/0.30 W.u. (δ = −0.58), B(M1→ 2_2^+) = 0.0051 W.u., B(E2→ 0_1^+) = 0.15 W.u., (γ,γ'), (e,e′), (p,p′), (d,d′), (α,α'), (p,t)
2_7^+	4260		
4_4^+	4294	24 fs	(e,e′), (p,p′), (p,t)
4_5^+	4405	43 fs	(p,p′), (α,α'), (p,t)
3_1^-	4475	22 fs	B(E1→ 2_1^+) = 0.00060 W.u., (e,e′), (p,p′), (d,d′), (α,α'), (p,t)
0_4^+	4538	31 fs	log ft = 5.95 (β^+ from 1^+), (e,e′), (p,p′), (α,α')
4_6^+	4752		(e,e′), (p,p′), (d,d′), (α,α'), (p,t)
6_1^+	5127		(e,e′), (p,p′), (α,α')
2_8^+	5156		(p,t)
1_2^+	5166		(p,p′)
4_7^+	5436		(e,e′), (p,p′)
4_8^+	5472		(p,p′), (p,t)
4_9^+	5585		(e,e′), (p,p′)
2_9^+	5592		(p,p′), (α,α'), (p,t)
2_{10}^+	5748		(p,p′)
4_{10}^+	5766		(p,p′)
1_1^-	5903		(e,e′)
2_{11}^+	5906		(e,e′), (p,p′)
3_2^-	6018		(e,e′), (p,p′)
1_2^-	6024	1.4 fs	(γ,γ'), (e,e′), (p,p′), (α,α')
3_3^-	6145		(e,e′)
4_{11}^+	6274		(e,e′), (p,p′)
3_4^-	6308		(p,p′), (α,α')

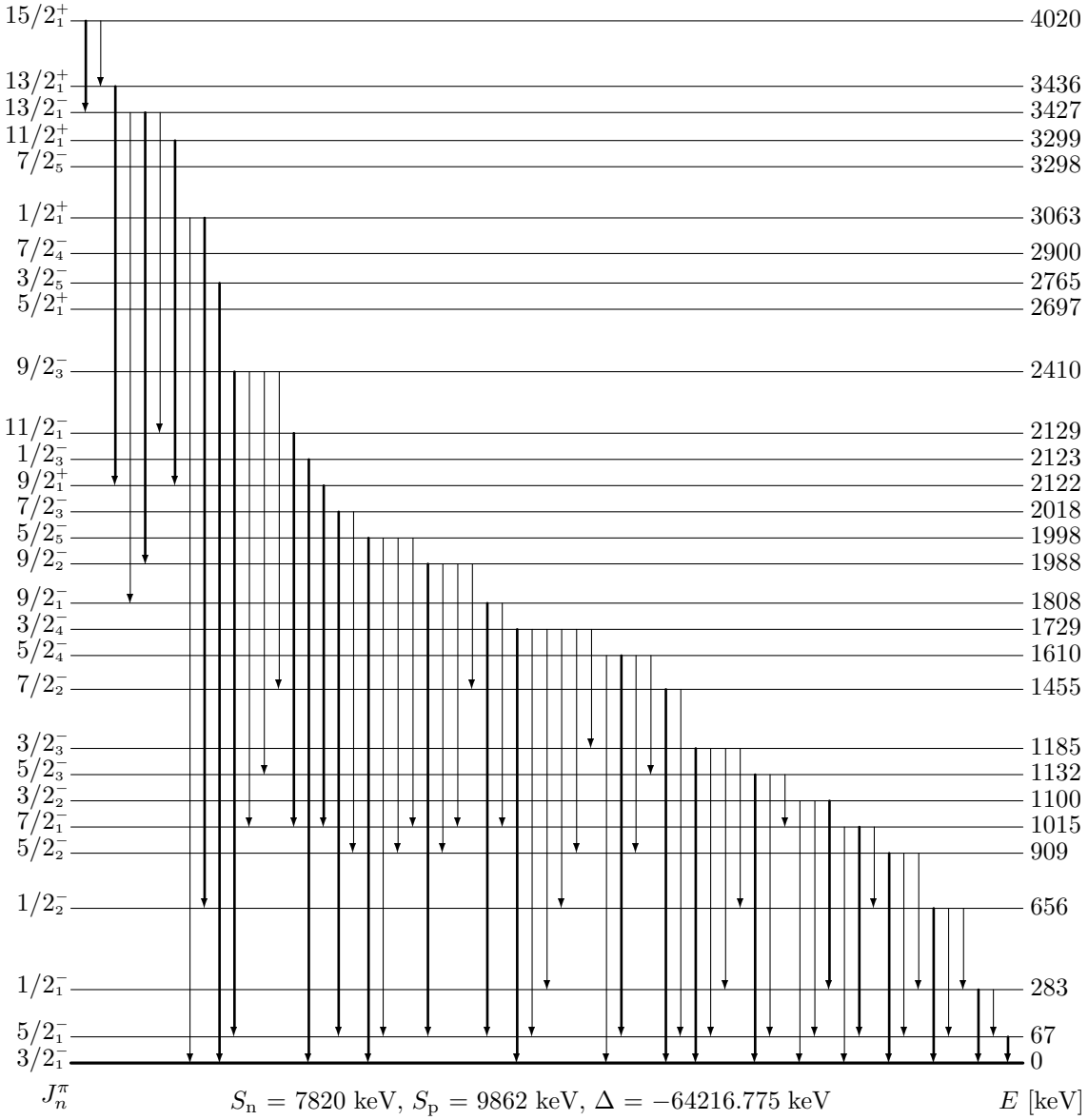

1/2$_4^+$ 5957
1/2$_3^+$ 5692
1/2$_2^+$ 5569
1/2$_1^+$ 5149
7/2$_{10}^-$ 4705
5/2$_1^+$ 4506
7/2$_9^-$ 4397
7/2$_8^-$ 4286
7/2$_7^-$ 4230
7/2$_6^-$ 4160
3/2$_7^-$ 3858
7/2$_5^-$ 3730
3/2$_6^-$ 3452
9/2$_1^+$ 3054
7/2$_4^-$ 3038
3/2$_5^-$ 2894
7/2$_3^-$ 2627
3/2$_4^-$ 2415
7/2$_2^-$ 1948
3/2$_3^-$ 1735
5/2$_3^-$ 1680
7/2$_1^-$ 1338
1/2$_2^-$ 1301
5/2$_2^-$ 1189
3/2$_2^-$ 878
1/2$_1^-$ 465
5/2$_1^-$ 339
3/2$_1^-$ 0
J_n^π
S_n = 9000 keV, S_p = 8598 keV, Δ = −61151.125 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93B5, 98B]
$3/2_1^-$	0	$7.6{\cdot}10^4$ y	log ft = 5.03 (β^+ from $3/2^-$), (p,n), (p,d), (d,p), (d,t), (t,d), (^{3}He,α), (α,^{3}He)
$5/2_1^-$	339	68 ps	B(M1→ $3/2_1^-$) = 0.0083 W.u., log ft = 5.83 (β^+ from $3/2^-$), μ = 0.35 μ_n, (p,n), (p,d), (d,p), (d,t), (t,d), (^{3}He,α), (α,^{3}He)
$1/2_1^-$	465	20 ps	B(M1→ $3/2_1^-$) = 0.011 W.u., log ft = 6.01 (β^+ from $3/2^-$), (p,n), (p,d), (d,p), (d,t), (t,d), (^{3}He,α), (α,^{3}He)
$3/2_2^-$	878	0.47 ps	B(M1/E2→ $3/2_1^-$) = 0.068/1.1 W.u. (δ = 0.08), log ft = 5.34 (β^+ from $3/2^-$), (p,n), (p,d), (d,p), (d,t), (^{3}He,α), (α,^{3}He)
$5/2_2^-$	1189	0.23 ps	B(M1/E2→ $3/2_1^-$) = 0.043/11 W.u. (δ = −0.43), log ft = 7.01 (β^+ from $3/2^-$), (p,n), (p,d), (d,p), (^{3}He,α), (α,^{3}He)
$1/2_2^-$	1301	0.111 ps	B(M1→ $1/2_1^-$) = 0.036 W.u., B(E2→ $5/2_1^-$) = 1.2 W.u., log ft = 4.69 (β^+ from $3/2^-$), (p,n), (p,d), (d,p), (d,t), (^{3}He,α), (α,^{3}He)
$7/2_1^-$	1338	0.95 ps	B(M1/E2→ $5/2_1^-$) = 0.0008/30 W.u. (δ = 4.5), B(E2→ $3/2_1^-$) = 2.9 W.u., log ft = 7.19 (β^+ from $3/2^-$), (p,n), (p,d), (d,p)
$5/2_3^-$	1680	196 fs	B(M1/E2→ $3/2_1^-$) = 0.0009/1.6 W.u. (δ = −1.6), B(E2→ $1/2_1^-$) = 1.41 W.u., log ft = 5.44 (β^+ from $3/2^-$), (p,n), (p,d), (d,p), (d,t), (^{3}He,α), (α,^{3}He)
$3/2_3^-$	1735	108 fs	log ft = 5.32 (β^+ from $3/2^-$), (d,p)
$7/2_2^-$	1948	123 fs	B(M1/E2→ $5/2_2^-$) = 0.042/10 W.u. (δ = 0.27), B(E2→ $3/2_2^-$) = 3.6 W.u., B(E2→ $3/2_1^-$) = 5.3 W.u., (p,n), (p,d), (d,p), (d,t), (t,d), (^{3}He,α), (α,^{3}He)
$3/2_4^-$	2415	37 fs	log ft = 5.52 (β^+ from $3/2^-$), (p,n), (d,p), (^{3}He,α)
$7/2_3^-$	2627		(p,n), (p,d), (d,p), (d,t), (^{3}He,α), (α,^{3}He)
$3/2_5^-$	2894	30 fs	(p,n), (d,p)
$7/2_4^-$	3038		(p,n), (p,d), (d,p), (^{3}He,α)
$9/2_1^+$	3054		(p,n), (d,p), (α,^{3}He)
$3/2_6^-$	3452		(d,p), (α,^{3}He)
$7/2_5^-$	3730		(p,d), (d,p), (^{3}He,α)
$3/2_7^-$	3858		(d,p)
$7/2_6^-$	4160		(p,d), (^{3}He,α)
$7/2_7^-$	4230		(p,d), (^{3}He,α)
$7/2_8^-$	4286		(d,p), (^{3}He,α)
$7/2_9^-$	4397		(d,p), (^{3}He,α)
$5/2_1^+$	4506		(d,p), (α,^{3}He)
$7/2_{10}^-$	4705		(p,d), (^{3}He,α)
$1/2_1^+$	5149		(d,p), (^{3}He,α)
$1/2_2^+$	5569		(d,p), (^{3}He,α)
$1/2_3^+$	5692		(d,p)
$1/2_4^+$	5957		(d,p)
$1/2_5^+$	6380		(d,p)
$1/2_6^+$	6924		(d,p)
$1/2_7^+$	6955		(d,p)
$1/2_8^+$	7160		(d,p)
$1/2_9^+$	7564		(d,p)
$1/2_{10}^+$	7865		(d,p)



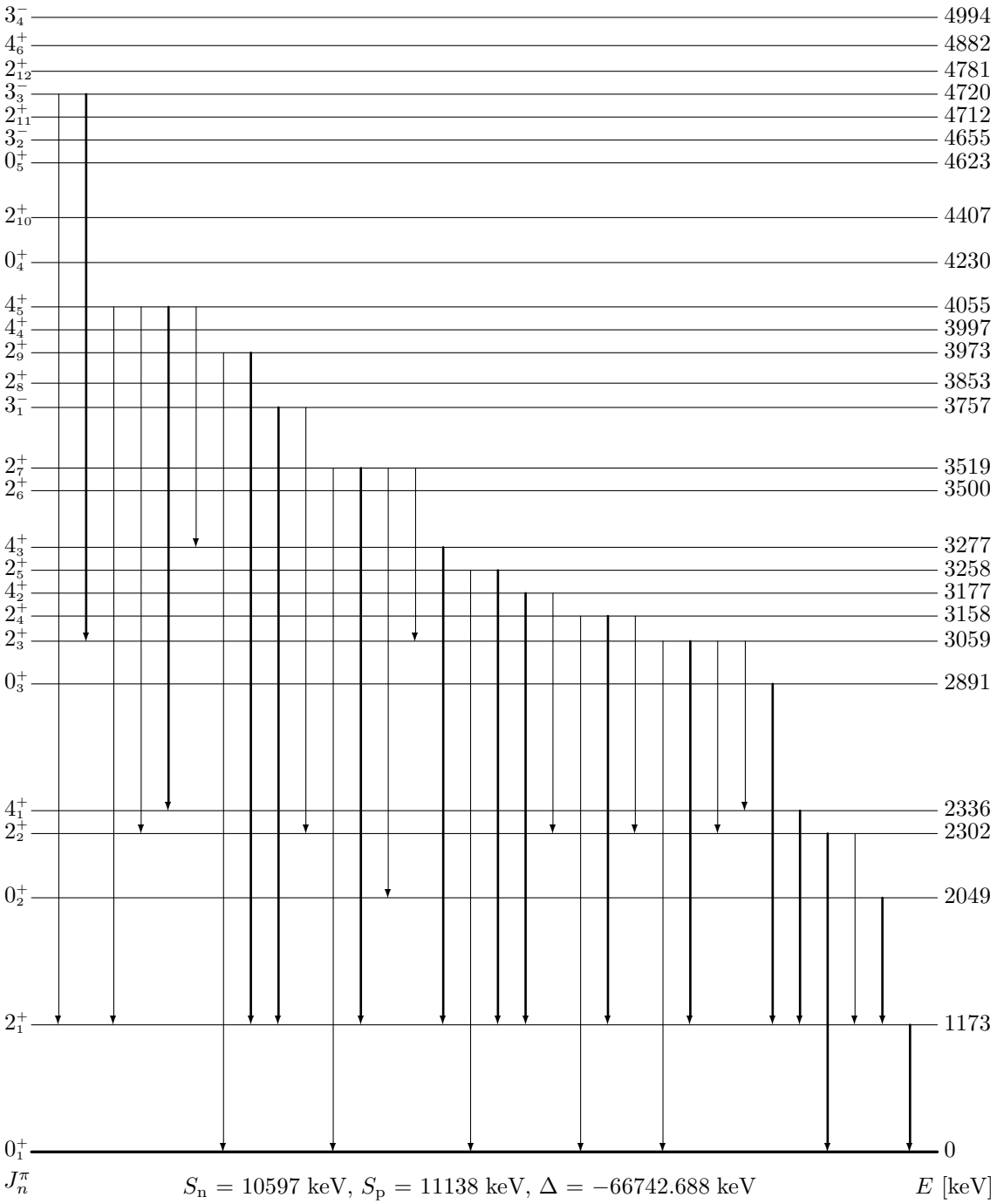
J^π_n $S_\mathrm{n} = 11389$ keV, $S_\mathrm{p} = 9533$ keV, $\Delta = -64468.100$ keV E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93K1, 98B]
0_1^+	0	stable	
2_1^+	1333	0.713 ps	B(E2→ 0_1^+) = 13.54 W.u., log ft = 15.03 (β^- from 5^+), log ft = 7.25 (β^- from 2^+), log ft = 7.30 (β^+ from 2^+), Q = 0.03 barn, μ = 0.18 μ_n, (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (p,d), (^{3}He,d), (t,p), (p,t)
2_2^+	2159	0.59 ps	B(E2→ 0_1^+) = 0.22 W.u., log ft = 12.90 (β^- from 5^+), log ft = 7.41 (β^- from 2^+), log ft = 6.37 (β^+ from 2^+), (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (p,d), (^{3}He,d), (t,p), (p,t)
0_2^+	2285	>1.5 ps	(p,p′), (d,d′), (α,α'), (p,d), (^{3}He,d), (t,p), (p,t)
4_1^+	2506	1.1 ps	B(E2→ 2_1^+) = 16 W.u., B(E4→ 0_1^+) = 5.3 W.u., log ft = 7.51 (β^- from 5^+), (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (p,d), (^{3}He,d), (t,p), (p,t)
3_1^+	2626	0.6 ps	log ft = 6.76 (β^+ from 2^+), (p,p′), (d,d′), (p,γ), (p,d), (^{3}He,d), (t,p), (p,t)
4_2^+	3120	0.24 ps	(e,e′), (p,p′), (d,d′), (p,γ), (^{3}He,d), (t,p), (p,t)
2_3^+	3124	>0.6 ps	log ft = 5.09 (β^+ from 2^+), (γ,γ'), (α,α'), (p,d), (^{3}He,d)
2_4^+	3269	71 fs	log ft = 5.97 (β^+ from 2^+), (γ,γ'), (p,p′), (p,γ), (p,d), (^{3}He,d), (t,p), (p,t)
0_3^+	3319	0.24 ps	(p,p′), (d,d′), (^{3}He,d), (t,p)
2_5^+	3394	0.13 ps	log ft = 6.56 (β^+ from 2^+), (p,p′), (α,α'), (p,γ), (p,d), (^{3}He,d), (t,p), (p,t)
0_4^+	3588	<40 ps	(p,p′)
4_3^+	3671	0.06 ps	(e,e′), (p,p′), (p,γ), (p,d), (^{3}He,d)
4_4^+	3700		(d,d′), (α,α')
2_6^+	3736	0.11 ps	log ft = 6.17 (β^+ from 2^+), (p,d), (t,p), (p,t)
3_1^-	4040	22 fs	(e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (p,d), (^{3}He,d), (t,p), (p,t)
5_1^+	4165	0.8 ps	(p,p′), (p,γ), (p,d), (^{3}He,d)
6_1^+	4265	0.45 ps	B(E2→ 4_1^+) = 5.0 W.u., (p,p′)
2_7^+	4493	16 fs	(p,p′), (α,α'), (p,d), (^{3}He,d)
2_8^+	4579	<18 fs	log ft = 6.43 (β^+ from 2^+), (p,p′), (p,d), (^{3}He,d), (t,p)
4_5^+	4958	61 fs	(p,p′), (p,t)
4_6^+	5015		(p,p′), (d,d′), (α,α'), (t,p)
8_1^-	5110		
4_7^+	5120		(α,α'), (^{3}He,d), (p,t)
4_8^+	5244	0.05 ps	(p,p′), (t,p), (p,t)
7_1^-	5349	250 ps	(p,p′), (t,p)
3_2^-	5396		(p,p′), (α,α'), (t,p)
2_9^+	5449		(p,p′), (d,d′), (p,γ), (p,d), (t,p), (p,t)
2_{10}^+	5799		(p,p′), (α,α')
5_1^-	5973		(p,p′), (α,α')
2_{11}^+	6331		(p,p′), (α,α'), (t,p)
8_2^-	7550		(e,e′)
3_3^-	8430		(p,t)
8_3^-	8433		(e,e′), (p,t)
8_4^-	8959		(e,e′)
8_5^-	9208		(e,e′)



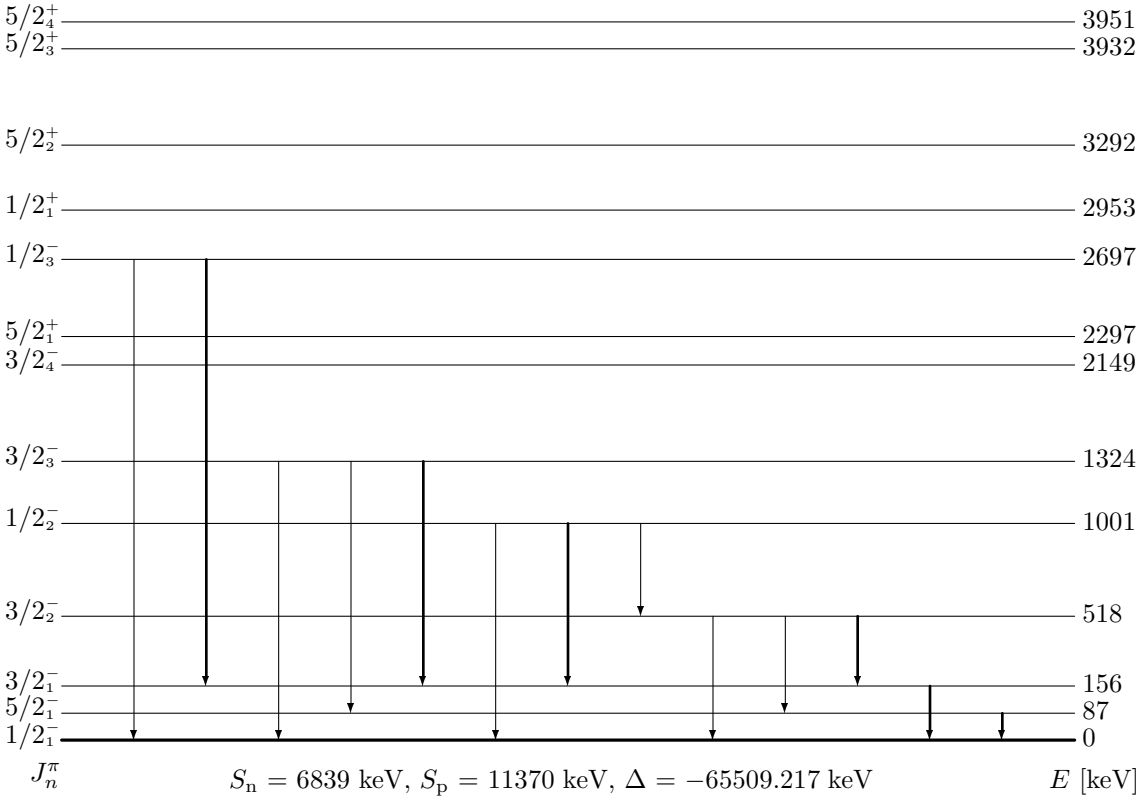
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92C, 98B]
$3/2_1^-$	0	stable	log ft = 5.07 (β^+ from $3/2^-$), Q = 0.192 barn, $\mu = -0.75002\ \mu_n$
$5/2_1^-$	67	5.34 ns	B(M1/E2→ $3/2_1^-$) = 0.0118/0.27 W.u. ($\delta = 7.6 \cdot 10^{-3}$), log ft = 5.24 (β^- from $7/2^-$), log ft = 6.31 (β^+ from $3/2^-$), $Q = -0.20$ barn, $\mu = 0.480\ \mu_n$
$1/2_1^-$	283	23 ps	B(M1/E2→ $3/2_1^-$) = 0.042/1.8 W.u. (δ = 0.044), log ft = 5.55 (β^+ from $3/2^-$), (p,p′), (t,p)
$1/2_2^-$	656	17 ps	B(M1/E2→ $3/2_1^-$) = 0.0010/11 W.u. (δ = 1.6), B(M1→ $1/2_1^-$) = 0.0038 W.u., B(E2→ $5/2_1^-$) = 2.7 W.u., log ft = 4.94 (β^+ from $3/2^-$), (γ,γ'), Coul. ex., (p,p′), (d,d′), (d,p), (p,d), (d,t), (t,p), (^{3}He,p)

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92C, 98B]
$5/2_2^-$	909	0.7 ps	B(E2→ $1/2_1^-$) = 18 W.u., B(M1/E2→ $5/2_1^-$) = 0.0019/16 W.u. ($\delta = 1.83$), B(M1/E2→ $3/2_1^-$) = 0.033/2.3 W.u. ($\delta = -0.18$), log ft = 4.81 (β^- from $7/2^-$), log ft = 5.70 (β^+ from $3/2^-$)
$7/2_1^-$	1015	4.4 ps	B(M1/E2→ $5/2_1^-$) = 0.00061/7.3 W.u. ($\delta = 2.46$), B(E2→ $3/2_1^-$) = 2.0 W.u., log ft = 7.80 (β^+ from $3/2^-$)
$3/2_2^-$	1100	0.16 ps	B(M1/E2→ $1/2_1^-$) = 0.12/18 W.u. ($\delta = 0.23$), log ft = 5.92 (β^+ from $3/2^-$), Coul. ex., (p,p′), (d,d′), (t,p), (^{3}He,p)
$5/2_3^-$	1132	0.32 ps	B(M1/E2→ $5/2_1^-$) = 0.0181/0.6 W.u. ($\delta = 0.14$), B(M1/E2→ $3/2_1^-$) = 0.023/7.3 W.u. ($\delta = -0.47$), log ft = 6.49 (β^+ from $3/2^-$), Coul. ex., (p,p′), (d,d′), (d,p), (p,d), (d,t)
$3/2_3^-$	1185	0.12 ps	B(M1/E2→ $3/2_1^-$) = 0.094/3.5 W.u. ($\delta = 0.17$), log ft = 5.00 (β^+ from $3/2^-$), Coul. ex., (p,p′), (d,d′), (d,p), (p,d), (d,t), (t,p), (^{3}He,p)
$7/2_2^-$	1455	0.58 ps	B(M1/E2→ $5/2_1^-$) = 0.00040/2.7 W.u. ($\delta = 2.7$), B(E2→ $3/2_1^-$) = 7 W.u., Coul. ex., (p,p′), (d,d′), (d,p), (p,d), (d,t), (t,p), (^{3}He,p)
$5/2_4^-$	1610	0.26 ps	B(M1/E2→ $5/2_1^-$) = 0.0115/0.04 W.u. ($\delta = -0.07$), B(M1/E2→ $3/2_1^-$) = 0.0076/0.6 W.u. ($\delta = -0.33$), log ft = 6.50 (β^+ from $3/2^-$), Coul. ex., (p,p′), (d,d′), (d,p), (p,d), (d,t), (t,p), (^{3}He,p)
$3/2_4^-$	1729	0.065 ps	log ft = 5.73 (β^+ from $3/2^-$), (p,p′), (d,d′), (d,p), (p,d), (d,t), (t,p), (^{3}He,p)
$9/2_1^-$	1808	0.6 ps	B(M1/E2→ $7/2_1^-$) = 0.004/11 W.u. ($\delta = 0.97$), B(E2→ $5/2_1^-$) = 4 W.u., (p,p′), (d,p), (t,p), (^{3}He,p)
$9/2_2^-$	1988	0.51 ps	B(M1/E2→ $7/2_2^-$) = 0.037/0.1 W.u. ($\delta = 0.02$), B(M1/E2→ $7/2_1^-$) = 0.0038/3.5 W.u. ($\delta = -0.70$), B(E2→ $5/2_2^-$) = 10 W.u., B(E2→ $5/2_1^-$) = 1.7 W.u., (t,p)
$5/2_5^-$	1998	0.045 ps	B(M1/E2→ $3/2_1^-$) = 0.039/1.3 W.u. ($\delta = -0.27$), log ft = 6.73 (β^+ from $3/2^-$), (p,p′), (d,p)
$7/2_3^-$	2018	0.12 ps	B(M1/E2→ $5/2_1^-$) = 0.022/0.004 W.u. ($\delta = -0.02$), (p,p′), (d,p), (p,d), (d,t), (t,p), (^{3}He,p)
$9/2_1^+$	2122	0.40 ps	B(E1→ $7/2_1^-$) = 0.0008 W.u., (p,p′), (d,p), (p,d), (t,p)
$1/2_3^-$	2123	0.044 ps	log ft = 5.03 (β^+ from $3/2^-$), (p,p′), (d,p)
$11/2_1^-$	2129	>2 ps	B(E2→ $7/2_1^-$) < 12 W.u., (^{3}He,p)
$9/2_3^-$	2410	0.19 ps	B(M1/E2→ $7/2_2^-$) = 0.022/0.4 W.u. ($\delta = -0.10$), B(E2→ $5/2_3^-$) = 7.2 W.u., B(M1/E2→ $7/2_1^-$) = 0.0020/1.8 W.u., B(E2→ $5/2_1^-$) = 1.8 W.u., (p,p′), (d,p), (t,p), (^{3}He,p)
$5/2_1^+$	2697		(d,p), (t,p)
$3/2_5^-$	2765		(p,p′), (d,p), (t,p)
$7/2_4^-$	2900		(p,p′), (p,d), (d,t), (t,p)
$1/2_1^+$	3063		(p,p′), (d,p), (p,d), (^{3}He,p)
$7/2_5^-$	3298		
$11/2_1^+$	3299	0.60 ps	B(M1/E2→ $9/2_1^+$) = 0.016/8 W.u. ($\delta = 0.63$)
$13/2_1^-$	3427	>0.7 ps	B(M1/E2→ $11/2_1^-$) < 0.00024/ < 1.4 W.u. ($\delta = -2.6$), B(E2→ $9/2_2^-$) < 6.4 W.u., B(E2→ $9/2_1^-$) < 1.1 W.u., (p,p′)
$13/2_1^+$	3436	1.0 ps	B(E2→ $9/2_1^+$) = 10 W.u.
$15/2_1^+$	4020	>1.4 ps	B(M1/E2→ $13/2_1^+$) < 0.017/ < 41 W.u. ($\delta = 0.63$), B(E1/M2→ $13/2_1^-$) < 0.0011/ < 56 W.u. ($\delta = -0.04$)

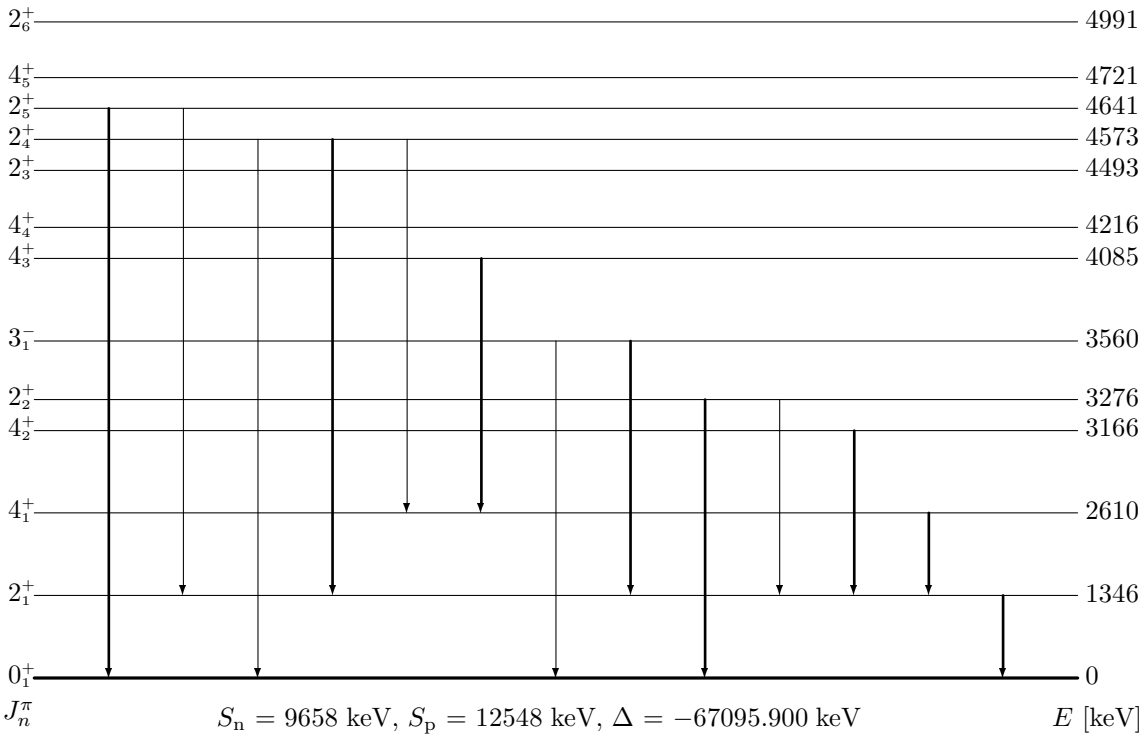


J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [90K, 98B]
0^+_1	0	stable	log ft = 8.40 (β^- from 2^+), log ft = 5.20 (β^+ from 1^+)
2^+_1	1173	1.45 ps	B(E2→ 0^+_1) = 12.06 W.u., log ft = 5.71 (β^- from 2^+), log ft = 7.00 (β^+ from 1^+), Q = 0.05 barn, μ = 0.66 μ_n

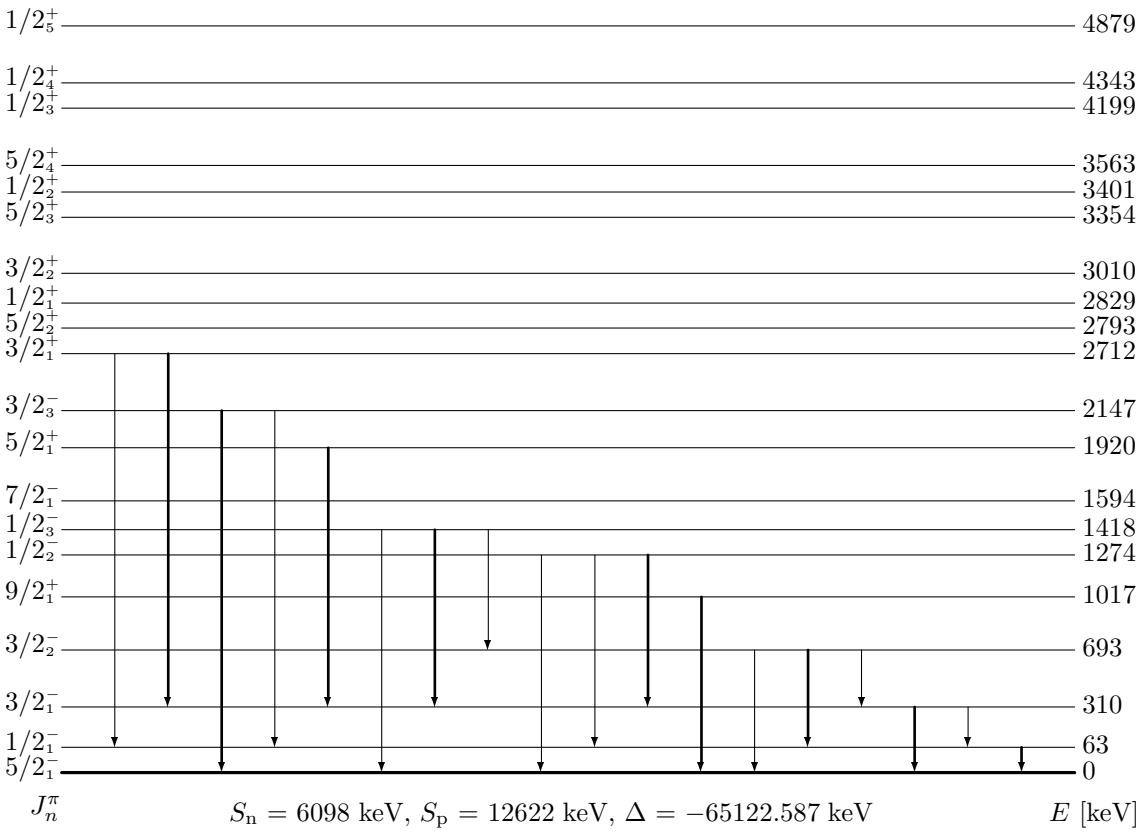
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [90K, 98B]
0_2^+	2049		log ft = 6.00 (β^+ from 1^+), (γ,γ'), (p,p′), (d,d′), (α,α'), (d,p), (p,t), (t,p)
2_2^+	2302	0.35 ps	B(M1/E2→ 2_1^+) = 0.0015/22 W.u. (δ = 3.19), B(E2→ 0_1^+) = 1.0 W.u., log ft = 5.57 (β^- from 2^+), log ft = 6.00 (β^+ from 1^+), (γ,γ'), (e,e′), (p,p′), (α,α'), (d,p), (p,t), (t,p)
4_1^+	2336	1.0 ps	B(E2→ 2_1^+) = 18 W.u., log ft = 6.10 (β^- from 5^+), (p,p′), (d,d′), (α,α'), (d,p), (d,^{3}He), (p,t), (t,p)
0_3^+	2891		log ft = 6.90 (β^+ from 1^+), (p,p′), (d,d′), (d,p), (p,t), (t,p)
2_3^+	3059		log ft = 6.80 (β^- from 2^+), (p,p′), (d,p), (p,t)
2_4^+	3158	0.08 ps	B(E2→ 0_1^+) = 0.42 W.u., log ft = 5.90 (β^- from 2^+), log ft = 6.90 (β^+ from 1^+), (γ,γ'), (p,p′), (d,d′), (α,α'), (p,t), (t,p)
4_2^+	3177		log ft = 6.03 (β^- from 5^+), (p,p′), (d,p), (p,t)
2_5^+	3258		log ft = 6.80 (β^- from 2^+), log ft = 6.20 (β^+ from 1^+), (p,p′), (d,p), (p,t)
4_3^+	3277	0.4 ps	log ft = 6.56 (β^- from 5^+), (d,d′), (α,α'), (p,t), (t,p)
2_6^+	3500		(α,α')
2_7^+	3519	0.10 ps	log ft = 5.90 (β^- from 2^+), (γ,γ'), (p,p′), (d,d′), (d,p), (p,t), (t,p)
3_1^-	3757	0.5 ps	(e,e′), (p,p′), (d,d′), (α,α'), (d,p), (p,t), (t,p)
2_8^+	3853		(p,p′), (d,p), (p,t)
2_9^+	3973		(γ,γ'), (p,t), (t,p)
4_4^+	3997		(p,p′), (p,t)
4_5^+	4055		log ft = 5.40 (β^- from 5^+), (p,p′), (d,p), (p,t)
0_4^+	4230		(γ,γ'), (p,p′), (d,d′), (p,t)
2_{10}^+	4407		(p,p′), (p,t)
0_5^+	4623		(p,p′), (p,t), (t,p)
3_2^-	4655		(p,p′), (p,t), (t,p)
2_{11}^+	4712		(p,p′), (d,p), (p,t), (t,p)
3_3^-	4720		(d,p)
2_{12}^+	4781		(p,p′), (α,α'), (p,t), (t,p)
4_6^+	4882		(p,p′), (d,p), (p,t)
3_4^-	4994		(p,p′), (p,t)
4_7^+	5016		(p,p′), (d,p), (p,t), (t,p)
2_{13}^+	5203		(p,p′), (p,t)
2_{14}^+	5310		(α,α')
4_8^+	5355		(p,p′), (p,t)
0_6^+	5447		(p,p′), (p,t), (t,p)
6_1^+	5530		(e,e′)
2_{15}^+	5541		(p,p′), (d,^{3}He), (p,t), (t,p)
3_5^-	5545		(p,p′), (d,p)
2_{16}^+	5574		(p,p′), (p,t), (t,p)
3_6^-	5628		(p,p′), (α,α'), (d,p), (p,t), (t,p)
4_9^+	5912		(p,p′), (p,t)
2_{17}^+	5930		(α,α')
1_1^-	6103		(p,p′), (d,p)
1_2^-	6313		(d,p), (p,t)
2_{18}^+	6354		(p,t)
4_{10}^+	6398		(d,p), (p,t)
3_7^-	6520		(p,p′), (α,α')
3_8^-	7030		(p,p′)



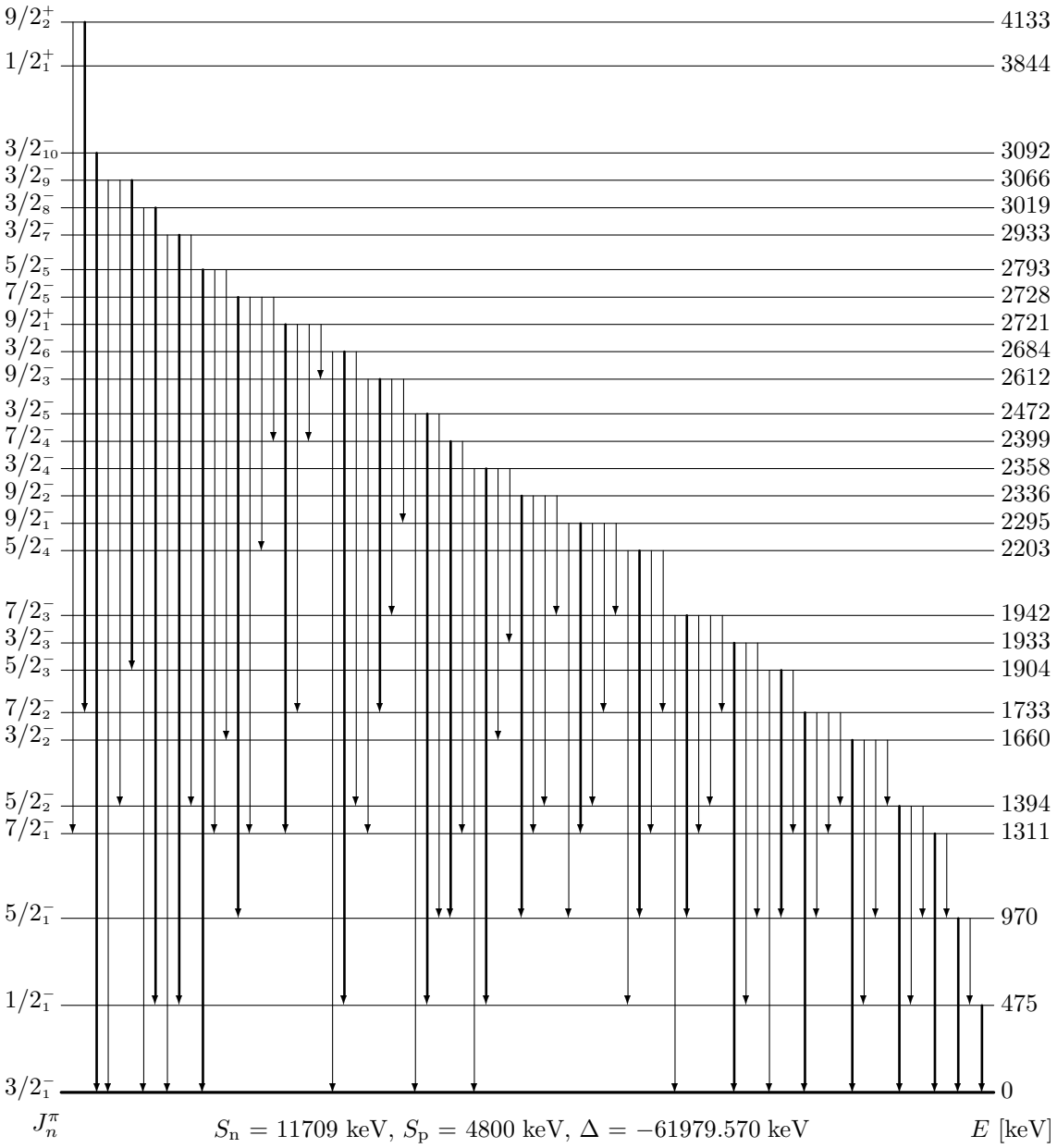
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [91K, 98B]
$1/2_1^-$	0	100.1 y	(p,d), (d,p), (d,t), (^{3}He,α), (d,α)
$5/2_1^-$	87	1.67 μs	B(E2→ $1/2_1^-$) = 2.27 W.u., log ft = 4.80 (β^- from $(7/2)^-$), μ = 0.752 μ_n, (d,p), (d,t), (^{3}He,α), (d,α)
$3/2_1^-$	156		log ft = 7.60 (β^- from $(7/2)^-$), (d,p), (d,t), (d,α)
$3/2_2^-$	518		log ft = 7.50 (β^- from $(7/2)^-$), (d,p), (d,t), (^{3}He,α), (d,α)
$1/2_2^-$	1001		(d,p), (d,t), (^{3}He,α), (d,α)
$3/2_3^-$	1324		(d,p), (d,t)
$3/2_4^-$	2149		(d,p), (d,t), (^{3}He,α)
$5/2_1^+$	2297		(d,p), (d,t)
$1/2_3^-$	2697		(d,p)
$1/2_1^+$	2953		(d,p)
$5/2_2^+$	3292		(d,p)
$5/2_3^+$	3932		(d,p), (d,α)
$5/2_4^+$	3951		(d,p)
$1/2_2^+$	4074		(d,p)
$1/2_3^+$	4267		(d,p)
$5/2_5^+$	4387		(d,p)
$1/2_4^+$	4692		(d,p)
$1/2_5^+$	4876		(d,p)
$1/2_6^+$	4957		(d,p)
$1/2_7^+$	6440		(d,p)



J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [96S, 98B]
0^+_1	0	stable	log ft = 4.27 (β^- from 1^+), log ft = 4.97 (β^+ from 1^+), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (d,^{3}He), (t,p)
2^+_1	1346	0.88 ps	B(E2→ 0^+_1) = 9.6 W.u., log ft = 5.10 (β^- from 1^+), log ft = 5.51 (β^+ from 1^+), Q = 0.35 barn, μ = 0.92 μ_n
4^+_1	2610	>0.31 ps	B(E2→ 2^+_1) < 37 W.u., (e,e′), (p,p′), (d,d′), (α,α'), (d,^{3}He), (t,p)
4^+_2	3166	0.13 ps	B(E2→ 2^+_1) = 14 W.u., (e,e′), (p,p′), (d,d′), (α,α'), (t,p)
2^+_2	3276	0.21 ps	(e,e′), (p,p′), (d,d′), (α,α'), (t,p)
3^-_1	3560	2.8 ps	B(E3→ 0^+_1) = 18.4 W.u., (e,e′), (p,p′), (d,d′), (α,α'), (t,p)
4^+_3	4085		(e,e′), (p,p′), (d,d′), (α,α'), (t,p)
4^+_4	4216		(e,e′), (p,p′), (t,p)
2^+_3	4493		(e,e′), (p,p′), (t,p)
2^+_4	4573	0.036 ps	(e,e′), (p,p′), (t,p)
2^+_5	4641	0.025 ps	(e,e′), (p,p′), (t,p)
4^+_5	4721		(e,e′), (p,p′), (t,p)
2^+_6	4991		(e,e′), (p,p′), (d,^{3}He), (t,p)
4^+_6	5093		(e,e′), (p,p′), (t,p)
4^+_7	5215		(e,e′), (p,p′), (t,p)
3^-_2	5370		(e,e′), (p,p′), (α,α')
2^+_7	5408		(e,e′), (p,p′), (t,p)
4^+_8	5734		(e,e′)
3^-_3	5817		(e,e′)
3^-_4	6018		(e,e′)
3^-_5	6116		(e,e′)

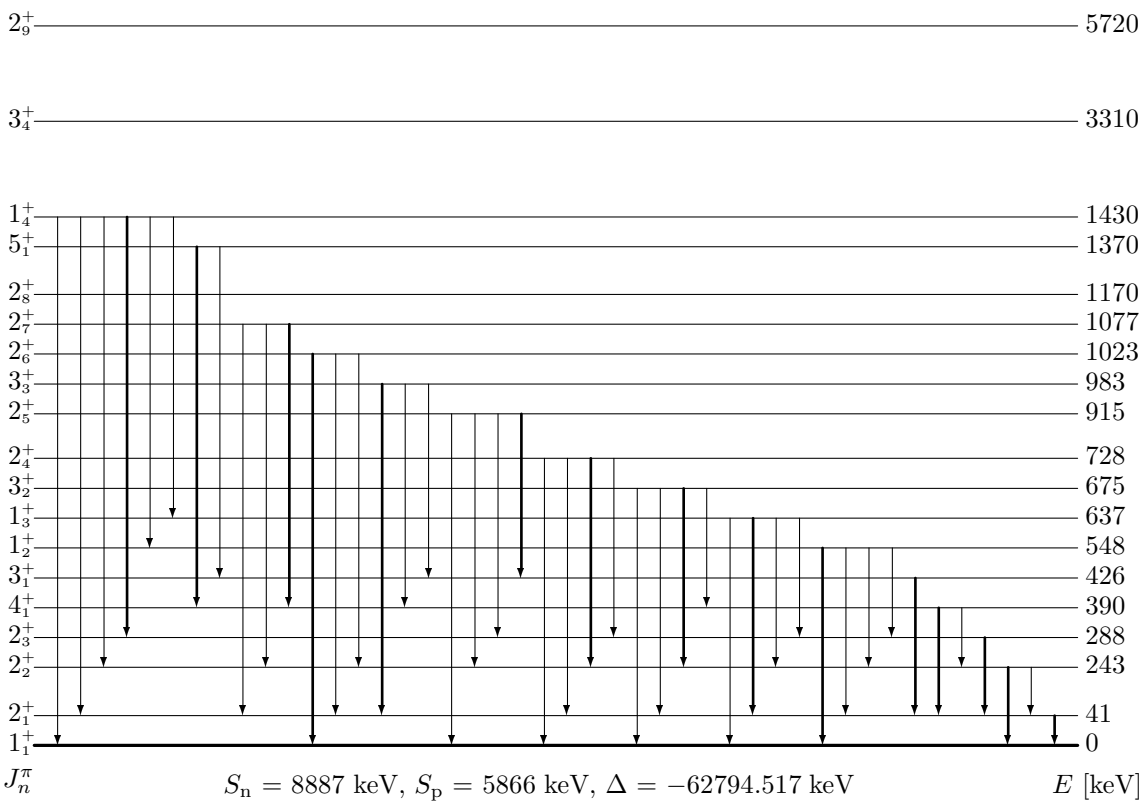


J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93B4, 98B]
$5/2^-_1$	0	2.5172 h	log ft = 4.50 (β^- from $(7/2)^-$), μ = 0.69 μ_n, (d,p), (t,d), (α,^{3}He)
$1/2^-_1$	63	69 μs	B(E2→ $5/2^-_1$) = 0.119 W.u., (d,p), (t,d), (α,^{3}He)
$3/2^-_1$	310		(d,p), (t,d)
$3/2^-_2$	693		log ft = 6.82 (β^- from $(7/2)^-$), (d,p), (t,d), (α,^{3}He)
$9/2^+_1$	1017	26.6 ns	(d,p), (t,d), (α,^{3}He)
$1/2^-_2$	1274		log ft = 5.19 (β^- from $(7/2)^-$), (d,p), (t,d)
$1/2^-_3$	1418		(d,p), (t,d), (α,^{3}He)
$7/2^-_1$	1594		(d,p), (t,d)
$5/2^+_1$	1920		(d,p), (t,d), (α,^{3}He)
$3/2^-_3$	2147		(d,p), (α,^{3}He)
$3/2^+_1$	2712		(d,p)
$5/2^+_2$	2793		(d,p)
$1/2^+_1$	2829		(d,p)
$3/2^+_2$	3010		(d,p)
$5/2^+_3$	3354		(d,p)
$1/2^+_2$	3401		(d,p)
$5/2^+_4$	3563		(d,p)
$1/2^+_3$	4199		(d,p)
$1/2^+_4$	4343		(d,p)
$1/2^+_5$	4879		(d,p)

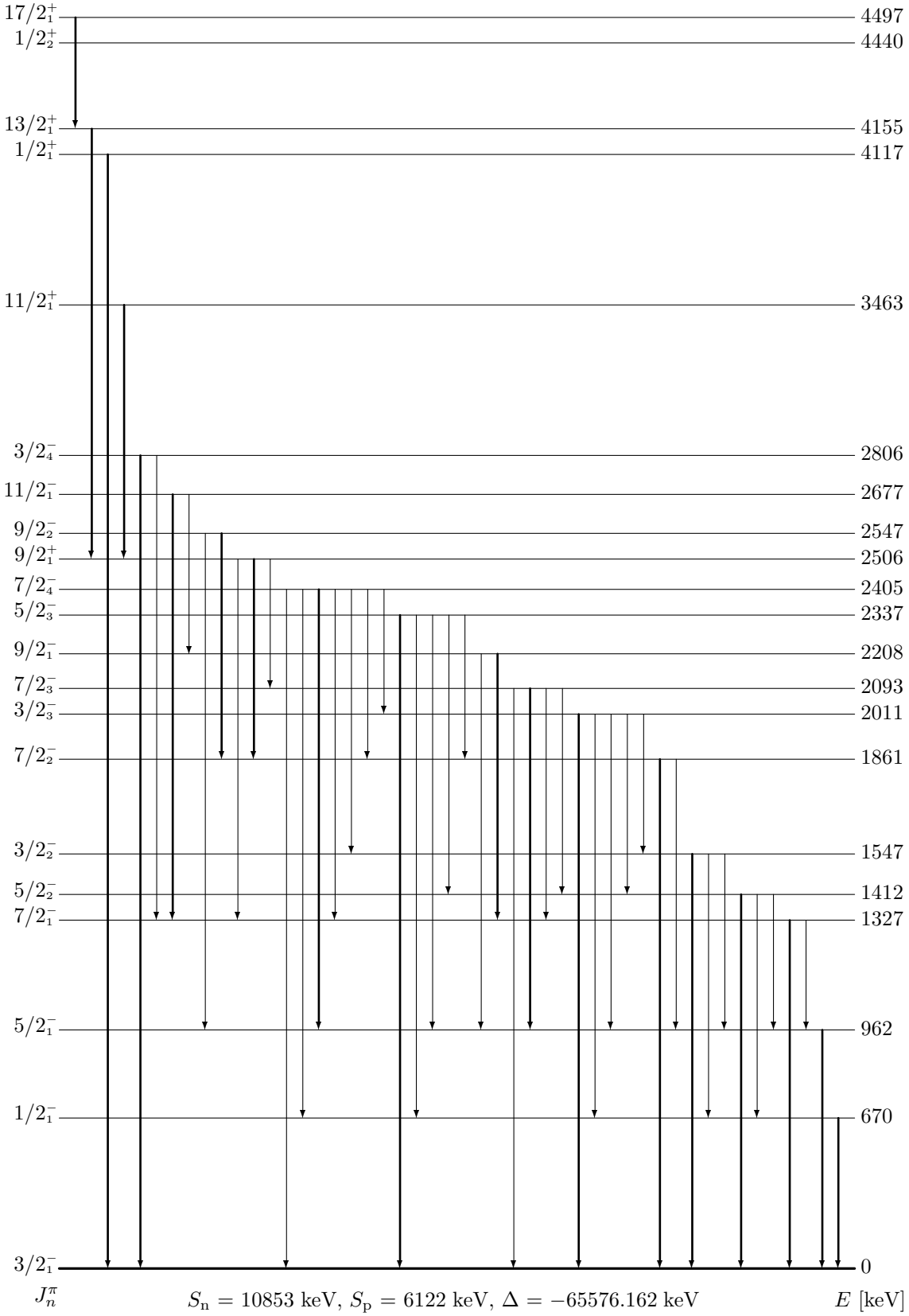


J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92C, 98B]
$3/2^-_1$	0	3.333 h	log ft = 5.41 (β^+ from $3/2^-$), μ = 2.14 μ_n
$1/2^-_1$	475	0.66 ps	log ft = 5.96 (β^+ from $3/2^-$), (p,n), (d,n), (^{3}He,d), (α,t), (p,t)
$5/2^-_1$	970	0.69 ps	B(E2→ $1/2^-_1$) = 17 W.u., B(M1/E2→ $3/2^-_1$) = 0.031/7.2 W.u. (δ = −0.35), log ft = 7.08 (β^+ from $3/2^-$), (p,n), (d,n), (^{3}He,d), (α,t), (p,t)
$7/2^-_1$	1311	0.53 ps	B(M1/E2→ $5/2^-_1$) = 0.065/0.3 W.u. (δ = −0.017), B(E2→ $3/2^-_1$) = 18.2 W.u., log ft = 8.00 (β^+ from $3/2^-$), (p,n), (^{3}He,d), (p,t)

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92C, 98B]
$5/2_2^-$	1394	0.85 ps	B(M1/E2→ $3/2_1^-$) = 0.00060/7.0 W.u. ($\delta = -3.55$), B(E2→ $1/2_1^-$) = 8.5 W.u., log ft = 6.68 (β^+ from $3/2^-$), (p,n), (d,n), (^{3}He,d), (p,t)
$3/2_2^-$	1660	0.182 ps	B(M1/E2→ $5/2_1^-$) = 0.058/1 W.u. ($\delta = 0.05$), B(M1/E2→ $3/2_1^-$) = 0.0150/1.5 W.u. ($\delta = 0.39$), log ft = 5.30 (β^+ from $3/2^-$), (p,n)
$7/2_2^-$	1733	≥1.4 ps	B(M1/E2→ $7/2_1^-$) < 0.047/ < 8.3 W.u. ($\delta = 0.08$), B(M1/E2→ $5/2_1^-$) < 0.0040/ < 3.4 W.u. ($\delta = 0.50$), B(M1→ $5/2_2^-$) < 0.0072 W.u., B(E2→ $3/2_1^-$) < 1.1 W.u., log ft = 6.90 (β^+ from $3/2^-$), (p,n), (^{3}He,d)
$5/2_3^-$	1904	180 fs	B(M1/E2→ $7/2_1^-$) = 0.129/1.7 W.u. ($\delta = -0.05$), B(M1/E2→ $5/2_1^-$) = 0.061/2.5 W.u. ($\delta = -0.14$), B(M1/E2→ $3/2_1^-$) = 0.0044/1.01 W.u. ($\delta = 0.68$), log ft = 6.80 (β^+ from $3/2^-$), (p,n), (^{3}He,d), (p,t)
$3/2_3^-$	1933	87 fs	B(M1/E2→ $1/2_1^-$) = 0.020/0.7 W.u. ($\delta = 0.20$), B(M1/E2→ $3/2_1^-$) = 0.022/0.7 W.u. ($\delta = 0.26$), log ft = 6.25 (β^+ from $3/2^-$), (p,n), (d,n), (^{3}He,d)
$7/2_3^-$	1942	1.2 ps	B(M1/E2→ $7/2_2^-$) = 0.20/1 W.u. ($\delta = -0.01$), B(M1/E2→ $7/2_1^-$) = 0.013/4 W.u. ($\delta = -0.26$), B(E2→ $3/2_1^-$) = 0.12 W.u., (p,n)
$5/2_4^-$	2203	173 fs	B(M1/E2→ $7/2_1^-$) = 0.034/0.01 W.u. ($\delta = -0.01$), B(M1/E2→ $5/2_1^-$) = 0.032/0.03 W.u. ($\delta = -0.03$), B(E2→ $1/2_1^-$) = 3.4 W.u., (p,n), (^{3}He,d)
$9/2_1^-$	2295	1.8 ps	B(M1/E2→ $7/2_3^-$) = 0.020/12 W.u. ($\delta = -0.20$), B(M1/E2→ $7/2_2^-$) = 0.010/19 W.u. ($\delta = 0.56$), B(M1/E2→ $7/2_1^-$) = 0.0043/0.23 W.u. ($\delta = -0.17$), B(E2→ $5/2_2^-$) = 10 W.u., B(E2→ $5/2_1^-$) = 0.67 W.u., (p,n)
$9/2_2^-$	2336	430 fs	B(M1/E2→ $7/2_1^-$) = 0.0098/1.1 W.u. ($\delta = -0.25$), B(E2→ $5/2_2^-$) = 1.5 W.u., B(E2→ $5/2_1^-$) = 14.5 W.u., (p,n), (d,n)
$3/2_4^-$	2358	197 fs	log ft = 5.70 (β^+ from $3/2^-$), (p,n), (d,n), (^{3}He,d)
$7/2_4^-$	2399	121 fs	B(M1/E2→ $7/2_1^-$) = 0.043/24 W.u. ($\delta = 0.6$), B(M1/E2→ $5/2_1^-$) = 0.035/0.8 W.u. ($\delta = -0.164$), (p,n), (^{3}He,d)
$3/2_5^-$	2472	75 fs	B(M1/E2→ $1/2_1^-$) = 0.031/0.01 W.u. ($\delta = -0.02$), log ft = 5.60 (β^+ from $3/2^-$), (p,n), (^{3}He,d)
$9/2_3^-$	2612	280 fs	B(M1/E2→ $7/2_3^-$) = 0.074/19 W.u. ($\delta = 0.25$), B(M1/E2→ $7/2_2^-$) = 0.060/18 W.u. ($\delta = 0.36$)
$3/2_6^-$	2684	85 fs	log ft = 5.37 (β^+ from $3/2^-$), (^{3}He,d)
$9/2_1^+$	2721	≥2.8 ps	B(E1→ $7/2_2^-$) < $6.1 \cdot 10^{-5}$ W.u., B(E1→ $7/2_1^-$) < $3.1 \cdot 10^{-5}$ W.u., (^{3}He,d)
$7/2_5^-$	2728	0.23 ps	B(M1/E2→ $7/2_1^-$) = 0.010/1 W.u. ($\delta = 0.4$), B(M1/E2→ $5/2_1^-$) = 0.0030/4.5 W.u. ($\delta = -1.6$)
$5/2_5^-$	2793	116 fs	log ft = 5.20 (β^+ from $3/2^-$), (^{3}He,d)
$3/2_7^-$	2933	65 fs	log ft = 5.39 (β^+ from $3/2^-$), (^{3}He,d)
$3/2_8^-$	3019	69 fs	B(M1/E2→ $1/2_1^-$) = 0.010/1.0 W.u. ($\delta = -0.6$), log ft = 5.80 (β^+ from $3/2^-$), (^{3}He,d)
$3/2_9^-$	3066	40 fs	(^{3}He,d)
$3/2_{10}^-$	3092	33 fs	log ft = 6.07 (β^+ from $3/2^-$), (^{3}He,d)
$1/2_1^+$	3844		(d,n)
$9/2_2^+$	4133		(^{3}He,d)
$1/2_2^+$	4357		(^{3}He,d)



J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [90K, 98B]
1_1^+	0	9.74 m	log ft = 5.00 (β^+ from 0^+), (d,t), (^{3}He,d), μ = −0.380 μ_n
2_1^+	41	4.57 ns	B(M1→ 1_1^+) = 0.0425 W.u., (d,t), (^{3}He,d), μ = 1.32 μ_n
2_2^+	243		(d,t)
2_3^+	288		(d,t), (^{3}He,d)
4_1^+	390	11 ns	B(E2→ 2_2^+) = 1.85 W.u., B(E2→ 2_1^+) = 0.66 W.u., μ = 2.67 μ_n, (d,t)
3_1^+	426	>0.16 ps	(d,t), (^{3}He,d)
1_2^+	548	>0.17 ps	B(M1→ 2_3^+) < 0.31 W.u., B(M1→ 2_1^+) < 0.46 W.u., B(M1→ 1_1^+) < 0.38 W.u., log ft = 4.65 (β^+ from 0^+), (d,t), (^{3}He,d)
1_3^+	637	0.15 ps	B(M1→ 2_1^+) = 0.63 W.u., B(M1→ 1_1^+) = 0.005 W.u., log ft = 4.61 (β^+ from 0^+), (d,t), (^{3}He,d)
3_2^+	675		(d,t), (^{3}He,d)
2_4^+	728		(d,t)
2_5^+	915		log ft = 7.20 (β^+ from 0^+), (d,t), (^{3}He,d)
3_3^+	983		(d,t), (^{3}He,d)
2_6^+	1023		(d,t)
2_7^+	1077		(d,t), (^{3}He,d)
2_8^+	1170		
5_1^+	1370	<2 ps	
1_4^+	1430		log ft = 5.63 (β^+ from 0^+)
3_4^+	3310		
2_9^+	5720		(^{3}He,d)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9/2−2 2547
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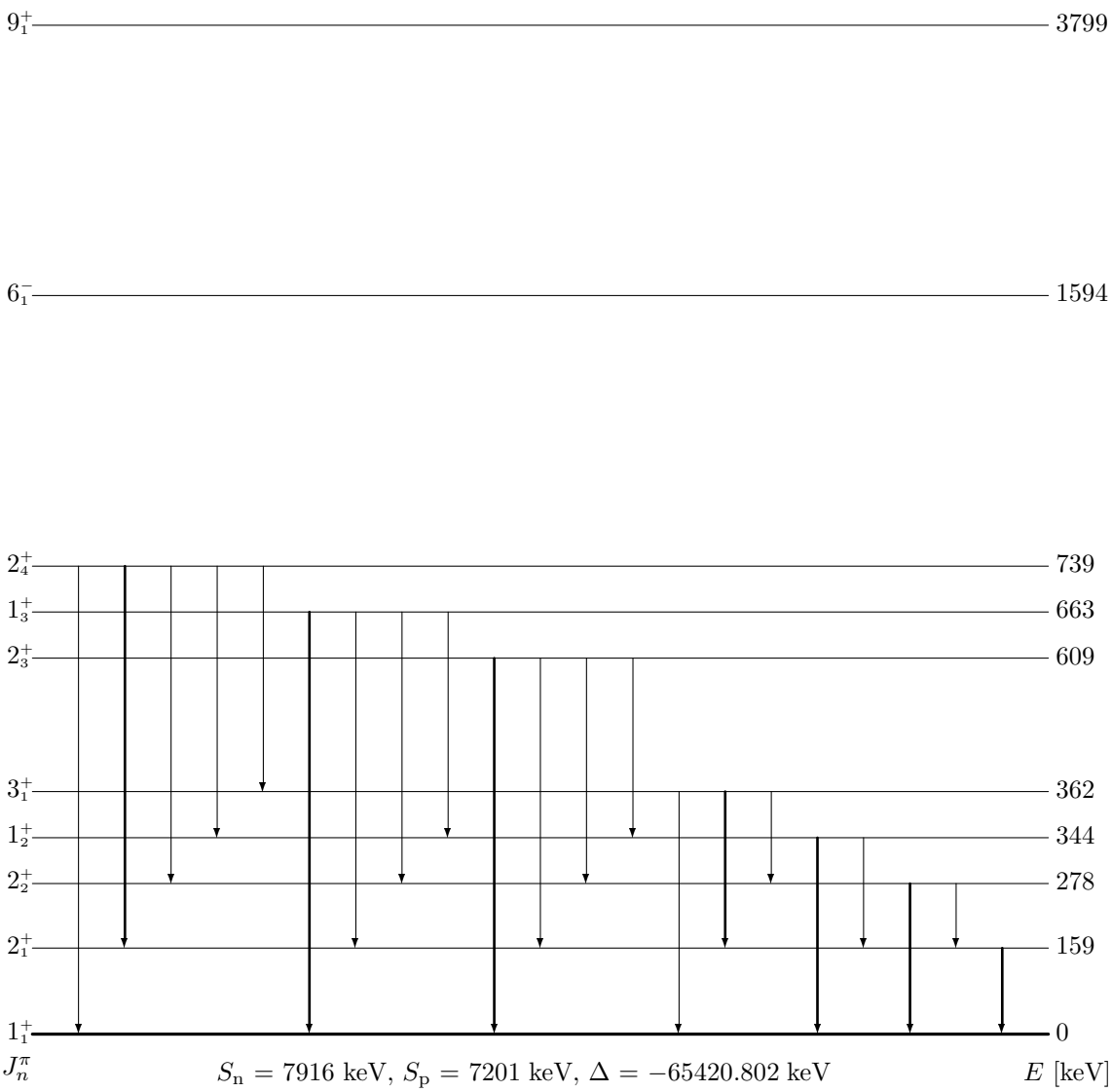
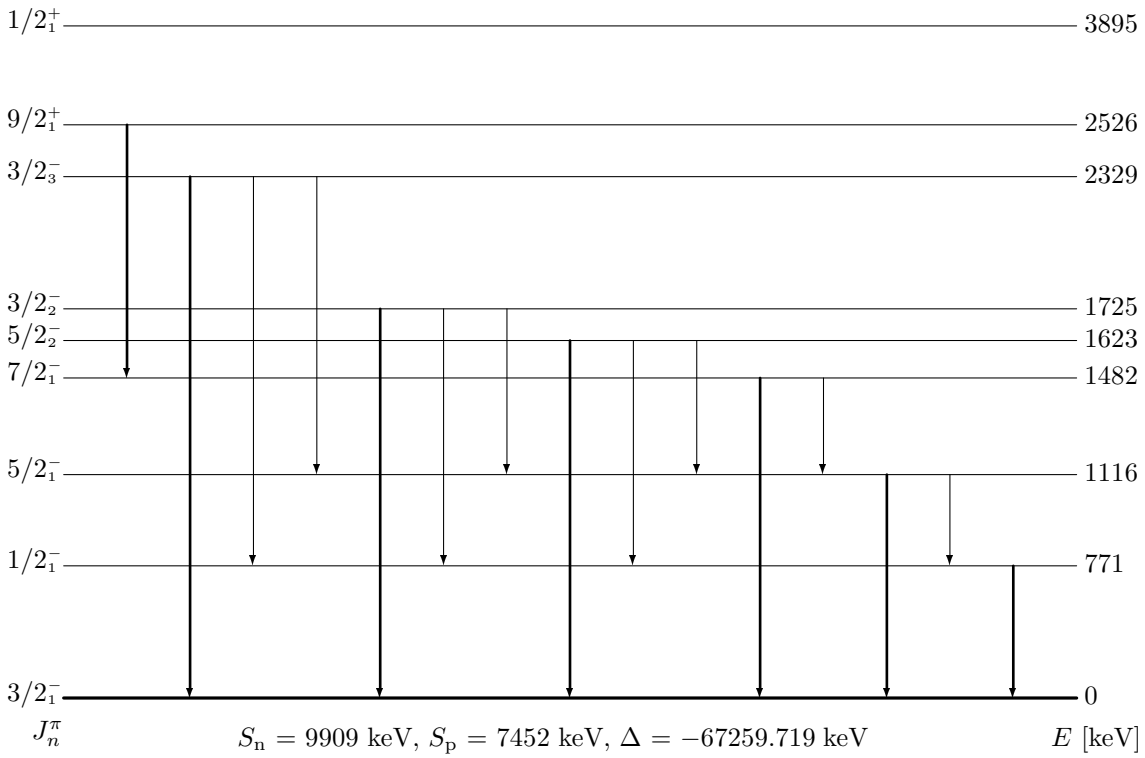
7/2−4 2405
5/2−3 2337
9/2−1 2208
7/2−3 2093
3/2−3 2011
7/2−2 1861
3/2−2 1547
5/2−2 1412
7/2−1 1327
5/2−1 962
1/2−1 670
3/2−1 0
J^π_n
S_n = 10853 keV, S_p = 6122 keV, Δ = −65576.162 keV
E [keV]

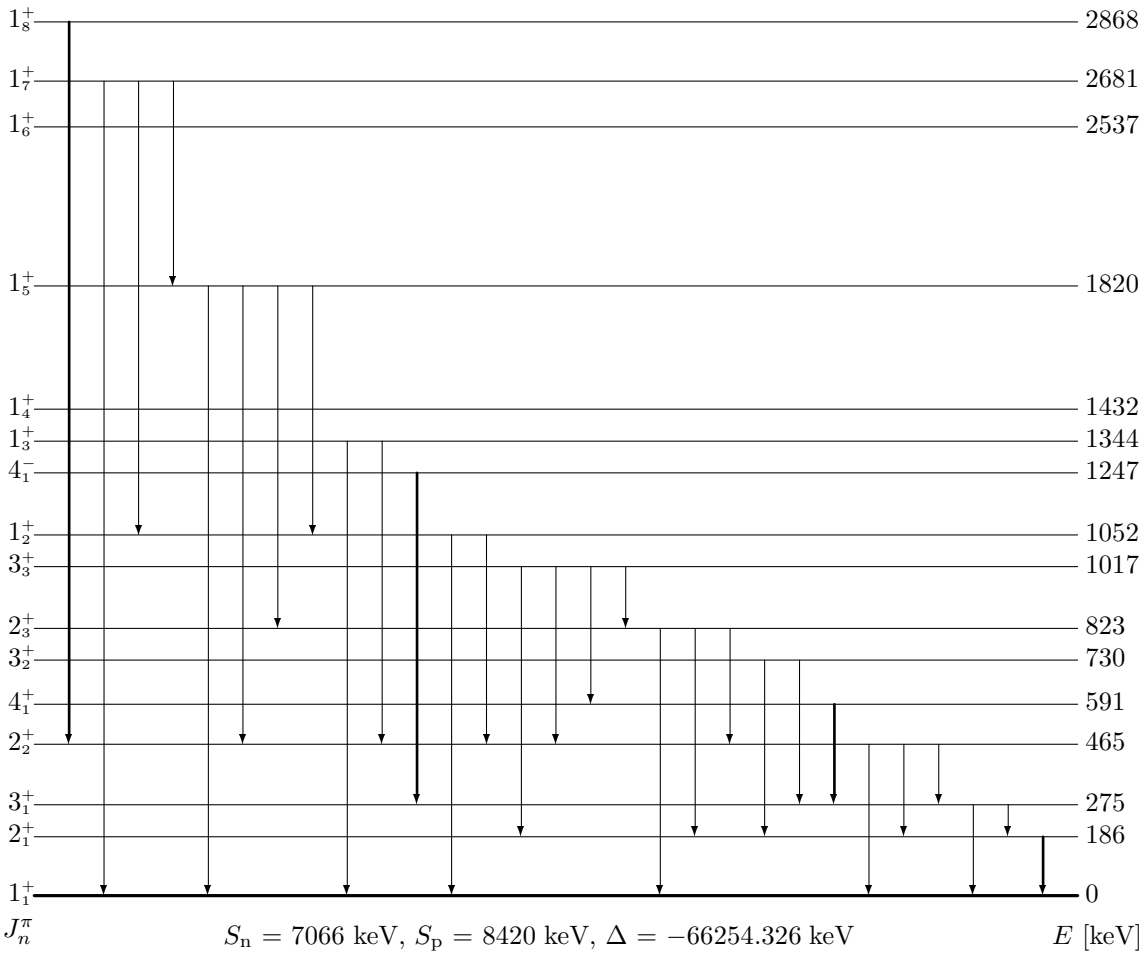
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [91K, 98B]
$3/2_1^-$	0	stable	log $ft = 6.70$ (β^- from $1/2^-$), log $ft = 5.40$ (β^+ from $3/2^-$), $Q = -0.211$ barn, $\mu = 2.22329\ \mu_n$
$1/2_1^-$	670	0.198 ps	B(M1/E2→ $3/2_1^-$) = 0.366/15.2 W.u. ($\delta = 0.104$), log $ft = 5.82$ (β^+ from $3/2^-$), (γ,γ'), Coul. ex., (e,e′), (α,α'), (p,p′), (p,γ), (d,n), (d,^{3}He), (p,t)
$5/2_1^-$	962	0.57 ps	B(M1/E2→ $3/2_1^-$) = 0.0350/15.7 W.u. ($\delta = -0.49$), log $ft = 5.61$ (β^+ from $3/2^-$), (γ,γ'), Coul. ex., (e,e′), (α,α'), (p,p′), (p,γ), (d,^{3}He), (p,t)
$7/2_1^-$	1327	0.61 ps	B(E2→ $3/2_1^-$) = 12.7 W.u., (γ,γ'), Coul. ex., (e,e′), (α,α'), (p,p′), (p,γ), (d,^{3}He), (p,t)
$5/2_2^-$	1412		B(E2→ $1/2_1^-$) = 10 W.u., log $ft = 5.87$ (β^+ from $3/2^-$), (γ,γ'), Coul. ex., (e,e′), (α,α'), (p,p′), (p,γ), (d,n), (d,^{3}He), (p,t)
$3/2_2^-$	1547	116 fs	B(M1/E2→ $3/2_1^-$) = 0.034/3.7 W.u. ($\delta = 0.39$), log $ft = 6.70$ (β^+ from $3/2^-$), (γ,γ'), Coul. ex., (e,e′), (α,α'), (p,p′), (p,γ), (d,^{3}He), (p,t)
$7/2_2^-$	1861		B(E2→ $3/2_1^-$) = 3.9 W.u., (γ,γ'), Coul. ex., (p,p′), (p,γ), (d,^{3}He), (p,t)
$3/2_3^-$	2011	33 fs	log $ft = 7.10$ (β^+ from $3/2^-$), (γ,γ'), (p,p′), (p,γ), (d,n), (p,t)
$7/2_3^-$	2093		B(E2→ $3/2_1^-$) = 0.22 W.u., (γ,γ'), (p,p′), (p,γ), (d,^{3}He), (p,t)
$9/2_1^-$	2208	0.31 ps	B(E2→ $5/2_1^-$) = 18 W.u., (p,p′), (p,t)
$5/2_3^-$	2337		log $ft = 5.84$ (β^+ from $3/2^-$), (γ,γ'), (p,p′), (p,γ), (p,t)
$7/2_4^-$	2405	0.12 ps	B(E2→ $3/2_1^-$) = 0.16 W.u., (p,p′), (p,γ), (p,t)
$9/2_1^+$	2506	1.5 ps	B(E1/M2→ $7/2_2^-$) = 0.00042/0.5 W.u. ($\delta = -0.01$), B(E1/M2→ $7/2_1^-$) = $2.4 \cdot 10^{-5}$/78 W.u., (e,e′), (α,α'), (p,p′), (p,γ), (d,^{3}He), (p,t)
$9/2_2^-$	2547		(p,p′)
$11/2_1^-$	2677	0.58 ps	B(M1/E2→ $9/2_1^-$) = 0.11/0.1 W.u. ($\delta = 0.01$), B(E2→ $7/2_1^-$) = 10 W.u.
$3/2_4^-$	2806	>0.18 ps	log $ft = 6.70$ (β^+ from $3/2^-$), (p,p′), (p,γ)
$11/2_1^+$	3463		
$1/2_1^+$	4117		(γ,γ'), (p,γ), (d,^{3}He)
$13/2_1^+$	4155		B(E2→ $9/2_1^+$) > 4.2 W.u.
$1/2_2^+$	4440		(d,^{3}He)
$17/2_1^+$	4497	4.1 ns	B(E2→ $13/2_1^+$) = 1.95 W.u., $\mu = 1.56\ \mu_n$
$1/2_2^-$	8564		(p,γ)
$5/2_4^-$	8628		(p,γ)
$5/2_5^-$	8638		(p,γ)
$3/2_5^-$	8693		(p,γ)
$3/2_6^-$	8700		(p,γ)
$3/2_7^-$	8727		(p,γ)
$3/2_8^-$	8742		(p,γ)
$3/2_9^-$	8743		(p,γ)
$3/2_{10}^-$	8747		(p,γ)
$3/2_{11}^-$	9119		
$1/2_3^-$	9584		
$9/2_2^+$	9849		
$5/2_1^+$	9970		



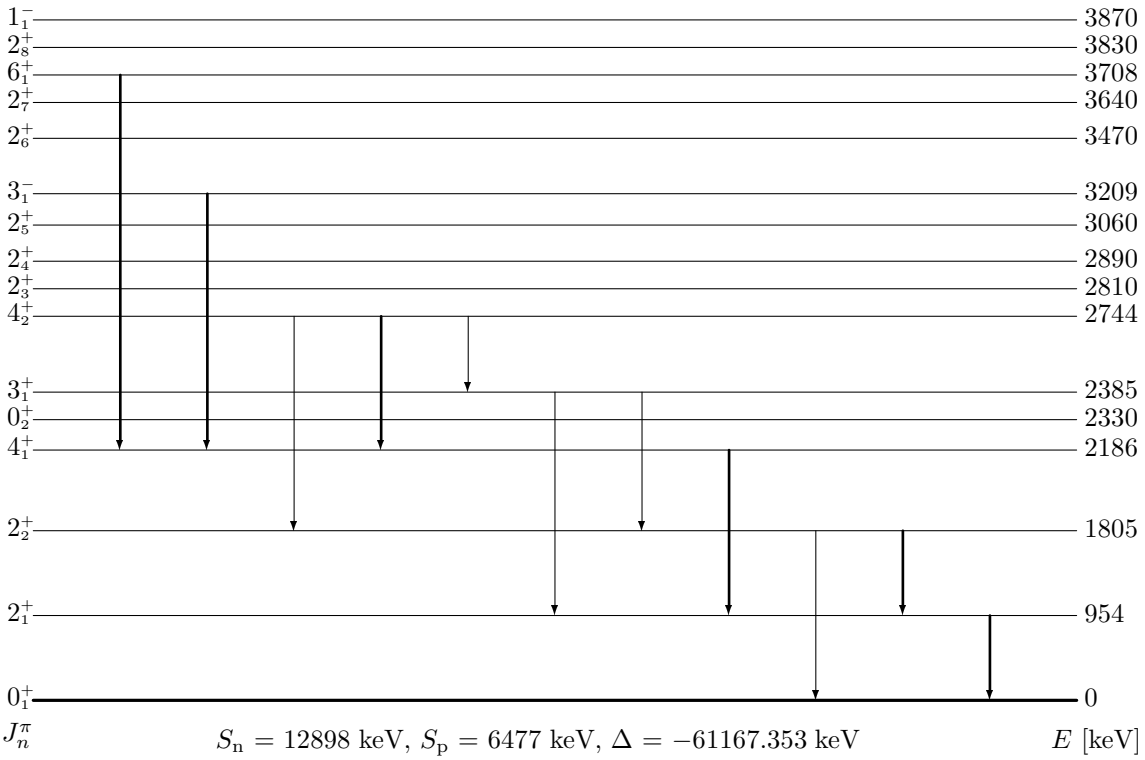
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [96S, 98B]
1_1^+	0	12.700 h	$\mu = -0.217\ \mu_n$, (p,n), (t,^{3}He), (d,p), (d,t), (d,α)
2_1^+	159	21 ps	B(M1/E2→ 1_1^+) = 0.26/250 W.u. ($\delta = 0.12$), (p,n), (t,^{3}He), (d,p), (d,t), (d,α)
2_2^+	278	<9 ps	(p,n), (t,^{3}He), (d,p), (d,t), (d,α)
1_2^+	344	<4 ps	(p,n), (t,^{3}He), (d,p), (d,t), (d,α)
3_1^+	362	<4 ps	(p,n), (t,^{3}He), (d,p), (d,t), (d,α)
2_3^+	609	<9 ps	(p,n), (t,^{3}He), (d,p), (d,t), (d,α)
1_3^+	663	<8 ps	(p,n), (d,p), (d,t), (d,α)
2_4^+	739	<11 ps	(p,n), (t,^{3}He), (d,p), (d,t), (d,α)
6_1^-	1594	20.4 ns	$\mu = 1.06\ \mu_n$, (α,d)
9_1^+	3799		(α,d)



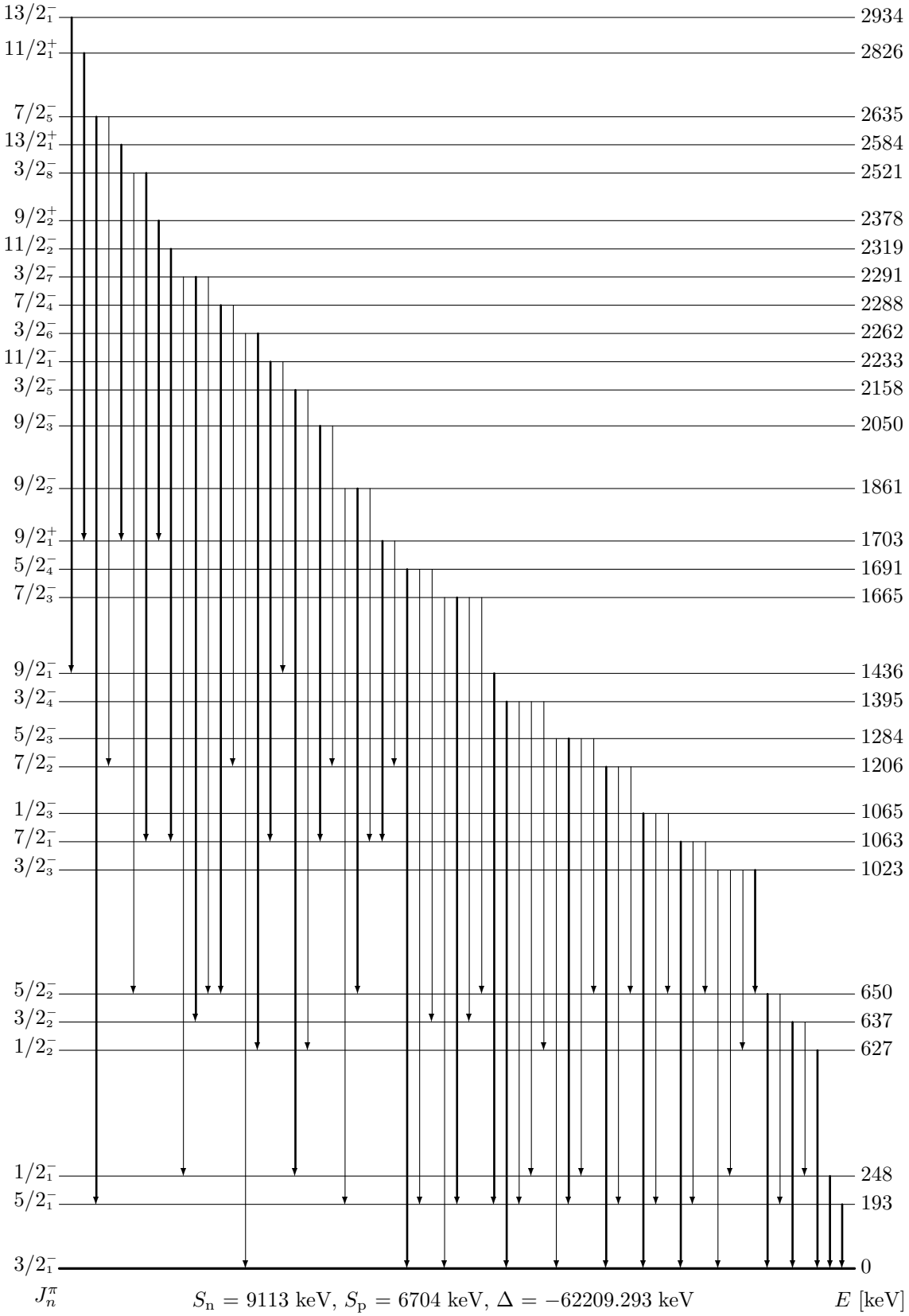
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93B4, 98B]
$3/2_1^-$	0	stable	log ft = 6.58 (β^- from $5/2^-$), log ft = 7.46 (β^+ from $5/2^-$), $Q = -0.195$ barn, $\mu = 2.38167\ \mu_n$
$1/2_1^-$	771	99 fs	B(M1/E2→ $3/2_1^-$) = 0.48/12 W.u. (δ = 0.096), (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (d,n), (n,d), (d,^{3}He), (t,p)
$5/2_1^-$	1116	0.285 ps	B(M1/E2→ $3/2_1^-$) = 0.0467/11.9 W.u. ($\delta = -0.437$), B(E2→ $1/2_1^-$) = 1.6 W.u., log ft = 6.06 (β^- from $5/2^-$), log ft = 5.89 (β^+ from $5/2^-$), μ = 4.4 μ_n, (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (n,d), (d,^{3}He), (t,p)
$7/2_1^-$	1482	0.41 ps	B(M1/E2→ $5/2_1^-$) = 0.18/2.1 W.u. ($\delta = -0.031$), B(E2→ $3/2_1^-$) = 10 W.u., log ft = 4.90 (β^- from $5/2^-$), (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (d,n), (n,d), (d,^{3}He), (t,p)
$5/2_2^-$	1623	1.0 ps	B(M1/E2→ $5/2_1^-$) = 0.05/14 W.u. (δ = 0.20), B(M1/E2→ $3/2_1^-$) < $4.4 \cdot 10^{-3}$/ < 2.7 W.u. ($\delta = -0.8$), B(E2→ $1/2_1^-$) = 7.4 W.u., log ft = 6.03 (β^- from $5/2^-$), (γ,γ'), (p,p′), (d,d′), (α,α'), (p,γ), (n,d), (d,^{3}He), (t,p)
$3/2_2^-$	1725	77 fs	B(M1/E2→ $5/2_1^-$) = 0.32/ < 30 W.u. ($\delta = -0.08$), B(M1/E2→ $3/2_1^-$) < 0.046/ < 25 W.u., (γ,γ'), (p,p′), (d,d′), (α,α'), log ft = 5.90 (β^- from $5/2^-$), (p,γ), (d,n), (n,d), (t,p)
$3/2_3^-$	2329	10 fs	B(M1/E2→ $3/2_1^-$) < 0.15/ < 41 W.u., (γ,γ'), (p,p′), (d,d′), (α,α'), (p,γ), (t,p)
$9/2_1^+$	2526		(p,p′), (α,α')
$1/2_1^+$	3895		(γ,γ'), (p,p′), (p,γ)



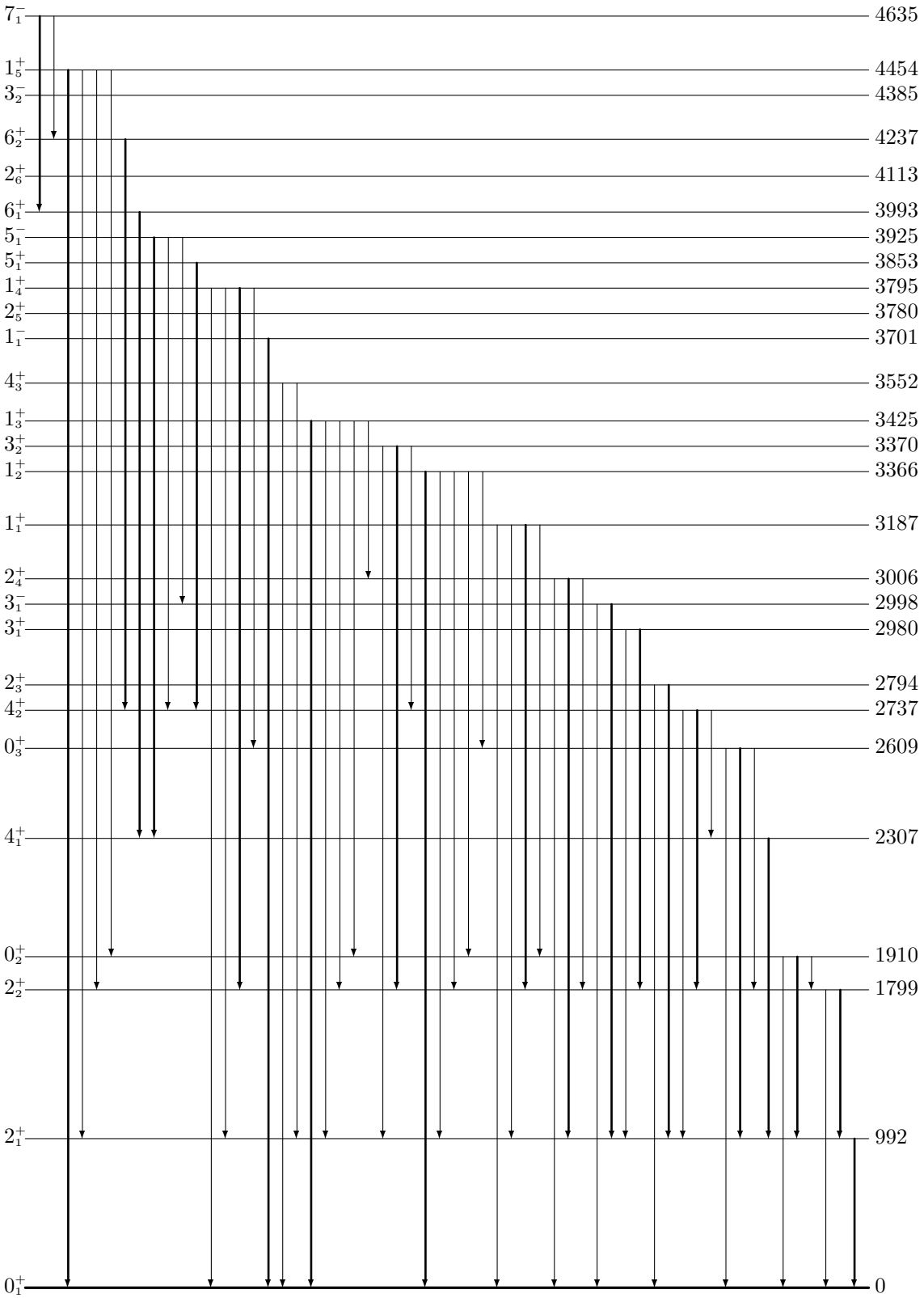
J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [90B, 98B]
1^+_1	0	5.088 m	log ft = 4.10 (β^- from 0^+), (d,p), (t,^{3}He), (d,α), (t,α), μ = −0.282 μ_n
2^+_1	186		(d,p), (t,^{3}He), (d,α), (t,α)
3^+_1	275		(d,p), (t,^{3}He), (d,α), (t,α)
2^+_2	465		(d,p), (t,^{3}He), (d,α), (t,α)
4^+_1	591		(d,p), (t,^{3}He), (d,α), (t,α)
3^+_2	730		(d,p), (d,α), (t,α)
2^+_3	823		(d,p), (t,^{3}He), (d,α), (t,α)
3^+_3	1017		(d,p), (t,^{3}He), (d,α), (t,α)
1^+_2	1052		(d,p), (d,α), (t,α)
4^-_1	1247		(d,p), (t,^{3}He), (d,α)
1^+_3	1344		(d,p), (t,^{3}He), (d,α), (t,α)
1^+_4	1432		(d,p), (d,α), (t,α)
1^+_5	1820		(d,p), (t,^{3}He), (d,α), (t,α)
1^+_6	2537		(d,α)
1^+_7	2681		(d,p), (d,α)
1^+_8	2868		(d,p), (d,α)



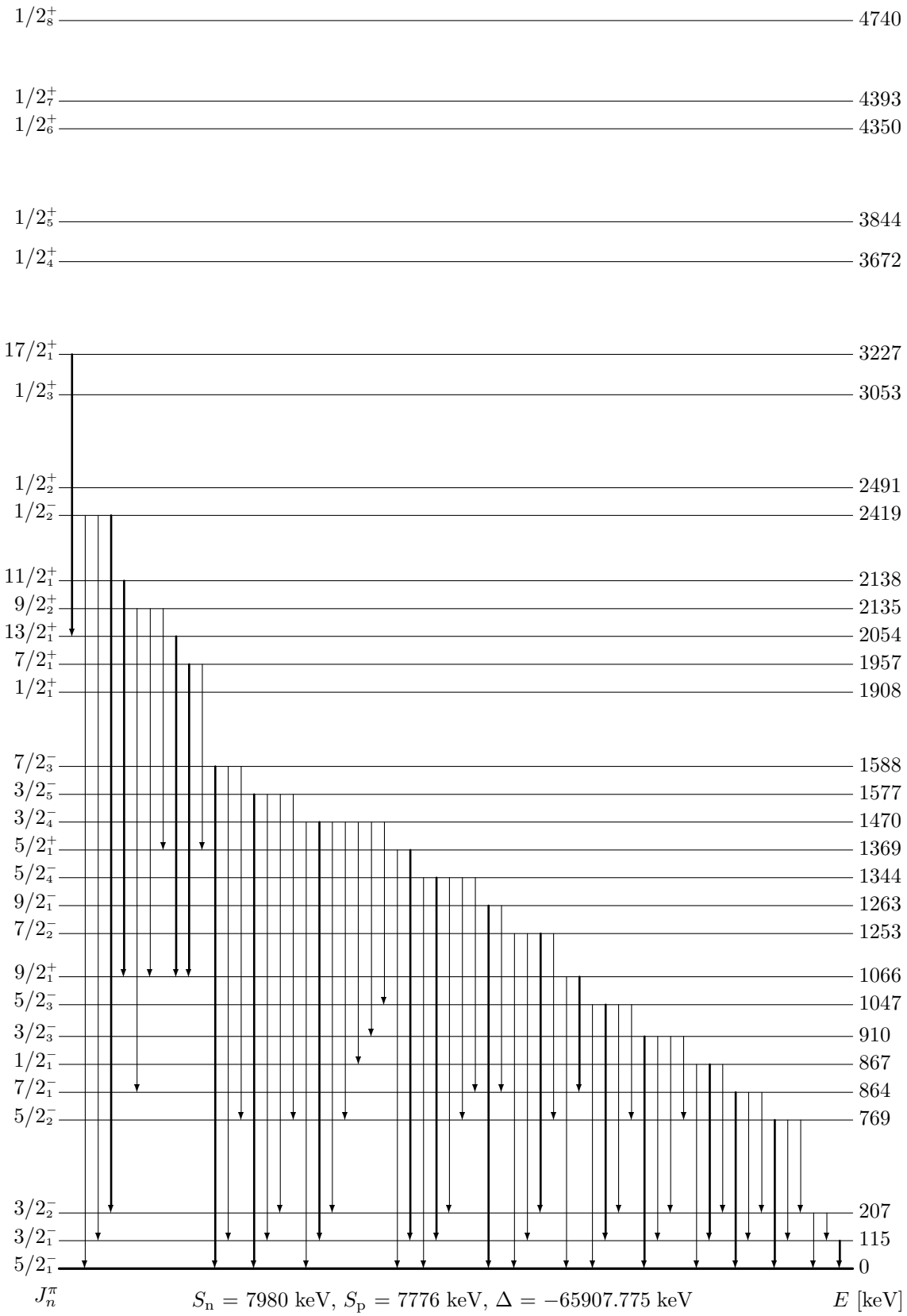
J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [90K, 98B]
0^+_1	0	9.186 h	log ft = 3.49 (β^+ from 0^+), (p,t), (^{3}He,n)
2^+_1	954	2.91 ps	B(E2→ 0^+_1) = 11.7 W.u., (p,t), (^{3}He,n)
2^+_2	1805	2.63 ps	B(M1/E2→ 2^+_1) = 0.0034/12 W.u. (δ = −1.2), B(E2→ 0^+_1) = 0.31 W.u., (p,t)
4^+_1	2186	0.53 ps	B(E2→ 2^+_1) = 26 W.u., (p,t)
0^+_2	2330		(p,t)
3^+_1	2385		(^{3}He,n)
4^+_2	2744	2.36 ps	B(M1/E2→ 3^+_1) = 0.007/7 W.u. (δ = −0.9), B(M1/E2→ 4^+_1) = 0.026/18 W.u. (δ = −0.35), (p,t)
2^+_3	2810		(p,t)
2^+_4	2890		(p,t)
2^+_5	3060		(p,t)
3^-_1	3209		(p,t)
2^+_6	3470		(p,t)
2^+_7	3640		(p,t)
6^+_1	3708	0.25 ps	B(E2→ 4^+_1) = 19 W.u.
2^+_8	3830		(p,t)
1^-_1	3870		(^{3}He,n)
0^+_3	4000		(p,t)
6^+_2	4500		(p,t)
4^+_3	4680		(p,t)
0^+_4	5340		(^{3}He,n)


13/2₁⁻ 2934
11/2₁⁺ 2826
7/2₅⁻ 2635
13/2₁⁺ 2584
3/2₈⁻ 2521
9/2₂⁺ 2378
11/2₂⁻ 2319
3/2₇⁻ 2291
7/2₄⁻ 2288
3/2₆⁻ 2262
11/2₁⁻ 2233
3/2₅⁻ 2158
9/2₃⁻ 2050
9/2₂⁻ 1861
9/2₁⁺ 1703
5/2₄⁻ 1691
7/2₃⁻ 1665
9/2₁⁻ 1436
3/2₄⁻ 1395
5/2₃⁻ 1284
7/2₂⁻ 1206
1/2₃⁻ 1065
7/2₁⁻ 1063
3/2₃⁻ 1023
5/2₂⁻ 650
3/2₂⁻ 637
1/2₂⁻ 627
1/2₁⁻ 248
5/2₁⁻ 193
3/2₁⁻ 0
J_n^π
S_n = 9113 keV, S_p = 6704 keV, Δ = −62209.293 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [91K, 98B]
$3/2_1^-$	0	38.47 m	log $ft = 5.00$ (β^+ from $3, 5/2^-$), (p,n), (p,d), (d,t), $Q = 0.29$ barn, $\mu = -0.28164\ \mu_n$
$5/2_1^-$	193	0.53 ns	B(M1/E2$\rightarrow 3/2_1^-$) = 0.0057/1.3 W.u. ($\delta = 0.07$), log $ft = 6.00$ (β^+ from $3, 5/2^-$), (p,n), (p,d), (d,t)
$1/2_1^-$	248	33 ps	log $ft = 6.20$ (β^+ from $3, 5/2^-$), (p,n), (p,d), (d,t)
$1/2_2^-$	627		log $ft = 5.50$ (β^+ from $3, 5/2^-$), (p,n), (p,d)
$3/2_2^-$	637	>0.53 ps	B(M1/E2$\rightarrow 1/2_1^-$) < 0.028/ < 1.8 W.u. ($\delta = -0.05$), B(M1/E2$\rightarrow 3/2_1^-$) < 0.15/ < 2.1 W.u. ($\delta = 0.04$), log $ft = 5.40$ (β^+ from $3, 5/2^-$), (p,n)
$5/2_2^-$	650	>0.28 ps	B(M1/E2$\rightarrow 5/2_1^-$) < 0.11/ < 7.4 W.u. ($\delta = -0.08$), B(M1/E2$\rightarrow 3/2_1^-$) < 0.19/ < $2.7 \cdot 10^2$ W.u. ($\delta = -0.57$), log $ft = 5.70$ (β^+ from $3, 5/2^-$), (p,n)
$3/2_3^-$	1023	>3.5 ps	B(M1/E2$\rightarrow 5/2_2^-$) < 0.029/ < $2.5 \cdot 10^2$ W.u. ($\delta = -0.82$), B(M1/E2$\rightarrow 1/2_2^-$) < 0.0053/ < 21 W.u. ($\delta = 0.57$), B(M1/E2$\rightarrow 1/2_1^-$) < 0.0025/ < 6.2 W.u. ($\delta = -0.91$), B(M1/E2$\rightarrow 3/2_1^-$) < 0.00040/ < 2.2 W.u. ($\delta = 1.9$), (p,n), (p,d)
$7/2_1^-$	1063	>0.29 ps	B(E2$\rightarrow 3/2_1^-$) < 64 W.u., (p,d)
$1/2_3^-$	1065	>0.22 ps	log $ft = 5.80$ (β^+ from $3, 5/2^-$), (p,n), (p,d)
$7/2_2^-$	1206	>0.42 ps	B(M1/E2$\rightarrow 5/2_1^-$) < 0.0011/ < 38 W.u. ($\delta = 4.7$), B(E2$\rightarrow 3/2_1^-$) < 18 W.u., (p,n), (p,d)
$5/2_3^-$	1284	>0.40 ps	B(E2$\rightarrow 1/2_1^-$) < 22 W.u., B(M1/E2$\rightarrow 3/2_1^-$) < 0.0013/ < 0.79 W.u. ($\delta = -0.7$), (p,n), (p,d)
$3/2_4^-$	1395	0.097 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.051/6 W.u. ($\delta = 0.36$), log $ft = 5.20$ (β^+ from $3, 5/2^-$), (p,n), (p,d)
$9/2_1^-$	1436	0.69 ps	B(E2$\rightarrow 5/2_1^-$) = 19 W.u., (p,n), (p,d)
$7/2_3^-$	1665	0.24 ps	B(M1/E2$\rightarrow 5/2_1^-$) = 0.017/0.43 W.u. ($\delta = 0.18$), B(E2$\rightarrow 3/2_1^-$) = 1.9 W.u., (p,d)
$5/2_4^-$	1691	0.069 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.055/0.33 W.u. ($\delta = -0.10$), log $ft = 5.30$ (β^+ from $3, 5/2^-$)
$9/2_1^+$	1703	32 ps	B(E1/M2$\rightarrow 7/2_2^-$) = $1.7 \cdot 10^{-5}$/0.12 W.u. ($\delta = 0.02$)
$9/2_2^-$	1861	0.43 ps	B(M1/E2$\rightarrow 7/2_1^-$) = 0.024/0.06 W.u. ($\delta = -0.03$), B(E2$\rightarrow 5/2_2^-$) = 21 W.u.
$9/2_3^-$	2050	>0.31 ps	
$3/2_5^-$	2158	0.028 ps	B(M1/E2$\rightarrow 1/2_2^-$) = $0.018/5. \cdot 10^1$ W.u. ($\delta = -2.0$), B(M1/E2$\rightarrow 1/2_1^-$) = 0.011/27 W.u. ($\delta = -2.3$), (p,d)
$11/2_1^-$	2233	>1.4 ps	B(E2$\rightarrow 7/2_3^-$) < $1.7 \cdot 10^2$ W.u.
$3/2_6^-$	2262	0.07 ps	
$7/2_4^-$	2288	>0.21 ps	
$3/2_7^-$	2291	0.06 ps	B(M1/E2$\rightarrow 1/2_1^-$) = 0.009/1.3 W.u. ($\delta = -0.6$)
$11/2_2^-$	2319	0.35 ps	B(E2$\rightarrow 7/2_1^-$) = 35 W.u.
$9/2_2^+$	2378	>1.39 ps	B(M1/E2$\rightarrow 9/2_1^+$) < 0.0096/ < $1.8 \cdot 10^2$ W.u. ($\delta = -2.5$)
$3/2_8^-$	2521		(p,d)
$13/2_1^+$	2584	3.54 ps	B(E2$\rightarrow 9/2_1^+$) = 19.0 W.u.
$7/2_5^-$	2635	0.19 ps	B(M1/E2$\rightarrow 7/2_2^-$) = 0.018/0.01 W.u. ($\delta = 0.02$), (p,d)
$11/2_1^+$	2826	291 fs	B(M1/E2$\rightarrow 9/2_1^+$) = 0.036/24 W.u. ($\delta = 0.7$)
$13/2_1^-$	2934	215 fs	B(E2$\rightarrow 9/2_1^-$) = 23 W.u.
$1/2_4^-$	6000		(p,n)
$5/2_5^-$	6300		(p,n)


7_1^- 4635
1_5^+ 4454
3_2^- 4385
6_2^+ 4237
2_6^+ 4113
6_1^+ 3993
5_1^- 3925
5_1^+ 3853
1_4^+ 3795
2_5^+ 3780
1_1^- 3701
4_3^+ 3552
1_3^+ 3425
3_2^+ 3370
1_2^+ 3366
1_1^+ 3187
2_4^+ 3006
3_1^- 2998
3_1^+ 2980
2_3^+ 2794
4_2^+ 2737
0_3^+ 2609
4_1^+ 2307
0_2^+ 1910
2_2^+ 1799
2_1^+ 992
0_1^+ 0
J_n^π
S_n = 11862 keV, S_p = 7712 keV, Δ = −65999.528 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [96S, 98B]
0_1^+	0	stable	log ft = 5.29 (β^- from 1^+), log ft = 6.57 (β^+ from 0^+), μ = 0.92 μ_n, (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (d,n), (p,t)
2_1^+	992	1.80 ps	B(E2→ 0_1^+) = 21.6 W.u., μ = 0.92 μ_n, (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (d,n), (p,t)
2_2^+	1799	2.0 ps	B(M1/E2→ 2_1^+) = 0.0007/40 W.u. (δ = −4.6), B(E2→ 0_1^+) = 0.23 W.u., (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (d,n), (p,t)
0_2^+	1910	0.95 ns	B(E2→ 2_2^+) = 60 W.u., B(E2→ 2_1^+) = 0.058 W.u., log ft = 7.40 (β^+ from 0^+), (p,p′), (d,d′), (p,t)
4_1^+	2307	0.33 ps	B(E2→ 2_1^+) = 29 W.u., (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (d,n), (p,t)
0_3^+	2609	0.20 ps	B(E2→ 2_1^+) = 17 W.u., log ft = 7.50 (β^+ from 0^+), (p,p′), (p,t)
4_2^+	2737	1.5 ps	B(M1/E2→ 4_1^+) = 0.015/9 W.u. (δ = −0.25), B(E2→ 2_2^+) = 30 W.u., B(E2→ 2_1^+) = 0.07 W.u., (p,p′), (α,α'), (p,γ), (p,t)
2_3^+	2794	0.049 ps	B(M1/E2→ 2_1^+) = 0.05/13 W.u. (δ = 0.7), (p,p′), (p,γ), (p,t)
3_1^+	2980	0.30 ps	B(M1/E2→ 2_2^+) = 0.028/0.09 W.u. (δ = −0.05), B(M1/E2→ 2_1^+) = 0.0032/0.09 W.u. (δ = 0.26), (p,p′), (p,γ)
3_1^-	2998	0.088 ps	B(E1→ 2_1^+) = 0.00059 W.u., B(E3→ 0_1^+) = 23 W.u., (e,e′), (p,p′), (d,d′), (α,α'), (p,γ), (p,t)
2_4^+	3006	0.057 ps	B(M1/E2→ 2_2^+) = 0.052/20 W.u. (δ = 0.6), B(M1→ 2_1^+) = 0.019 W.u., B(E2→ 0_1^+) = 0.71 W.u., (p,p′)
1_1^+	3187	0.042 ps	B(M1→ 0_2^+) = 0.053 W.u., B(M1→ 0_1^+) = $9\cdot10^{-5}$ W.u., log ft = 5.14 (β^+ from 0^+), (p,p′)
1_2^+	3366	0.023 ps	B(M1→ 0_3^+) = 0.11 W.u., B(M1→ 0_2^+) = 0.023 W.u., B(M1→ 0_1^+) = 0.013 W.u., log ft = 5.04 (β^+ from 0^+), (γ,γ'), (p,p′), (p,γ), (d,n)
3_2^+	3370	0.35 ps	B(M1/E2→ 2_2^+) = 0.008/0.9 W.u. (δ = −0.40), (p,p′), (d,n), (p,t)
1_3^+	3425	0.031 ps	B(M1→ 0_2^+) = 0.0064 W.u., B(M1→ 0_1^+) = 0.012 W.u., log ft = 5.63 (β^+ from 0^+), (γ,γ'), (p,p′), (d,n)
4_3^+	3552	>1.0 ps	B(M1/E2→ 4_1^+) < 0.005/ < 0.30 W.u. (δ = −0.16), (p,p′)
1_1^-	3701	0.025 ps	B(E1→ 0_1^+) = 0.00033 W.u., (γ,γ')
2_5^+	3780		(p,t)
1_4^+	3795		log ft = 5.58 (β^+ from 0^+), (p,p′)
5_1^+	3853	>2 ps	B(M1/E2→ 4_2^+) < 0.0045/ < 6.2 W.u. (δ = −1.00), (p,p′), (p,γ)
5_1^-	3925	<1.4 ps	B(E2→ 3_1^-) > 4.3 W.u., B(E1→ 4_1^+) > $6\cdot10^{-5}$ W.u., (p,p′)
6_1^+	3993	0.12 ps	B(E2→ 4_1^+) = 23 W.u., (p,p′)
2_6^+	4113		(p,p′), (p,t)
6_2^+	4237	0.13 ps	B(E2→ 4_2^+) = 38 W.u., (p,p′)
3_2^-	4385		(p,p′), (α,α'), (p,t)
1_5^+	4454	3.2 fs	B(M1→ 0_2^+) = 0.058 W.u., B(M1→ 0_1^+) = 0.047 W.u., log ft = 5.44 (β^+ from 0^+), (γ,γ'), (p,p′), (d,n)
7_1^-	4635	94 ps	B(E1→ 6_2^+) = $1.2\cdot10^{-5}$ W.u., B(E1→ 6_1^+) = $1.4\cdot10^{-5}$ W.u., (p,p′), (α,α')


1/2+8 4740
1/2+7 4393
1/2+6 4350
1/2+5 3844
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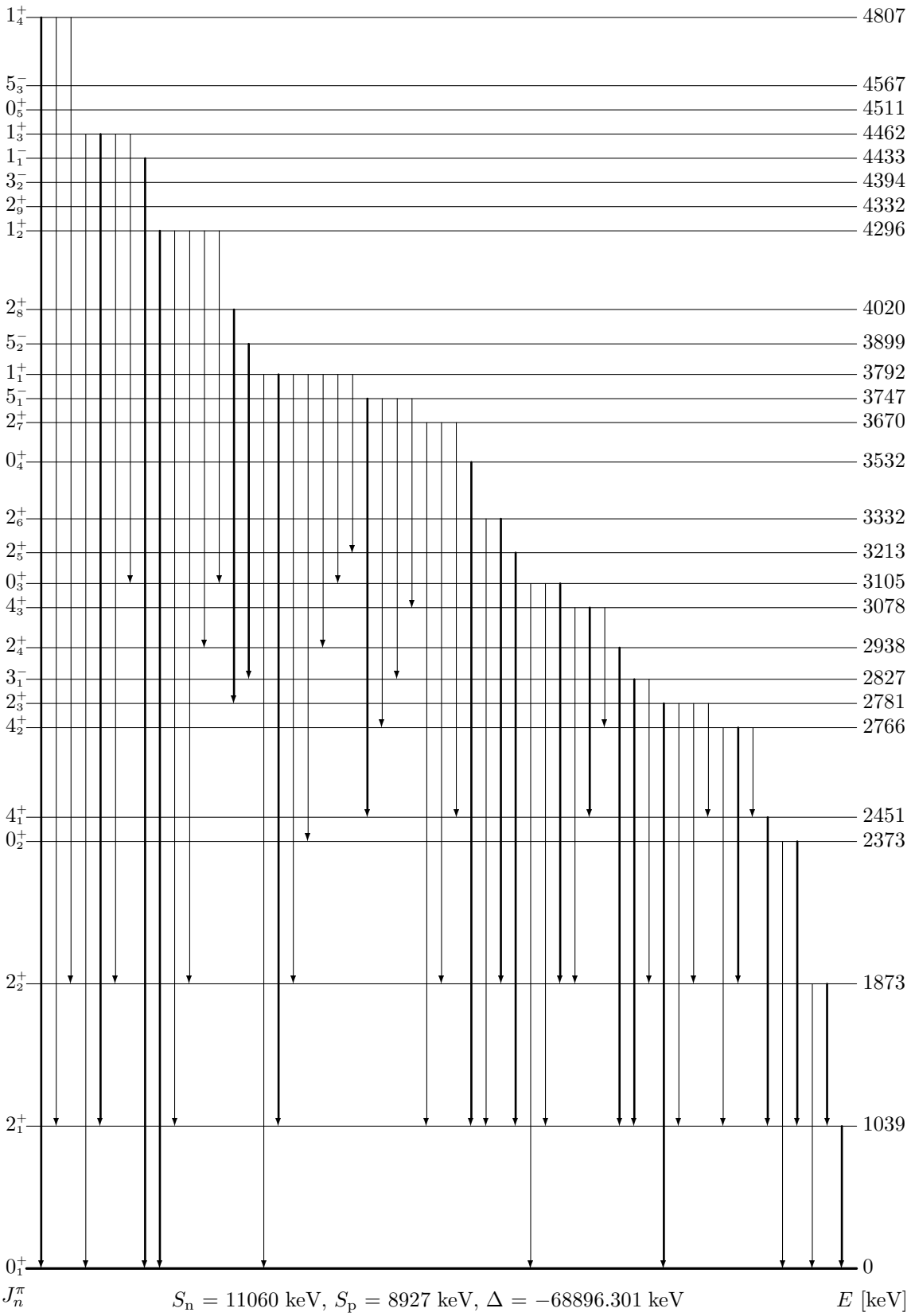
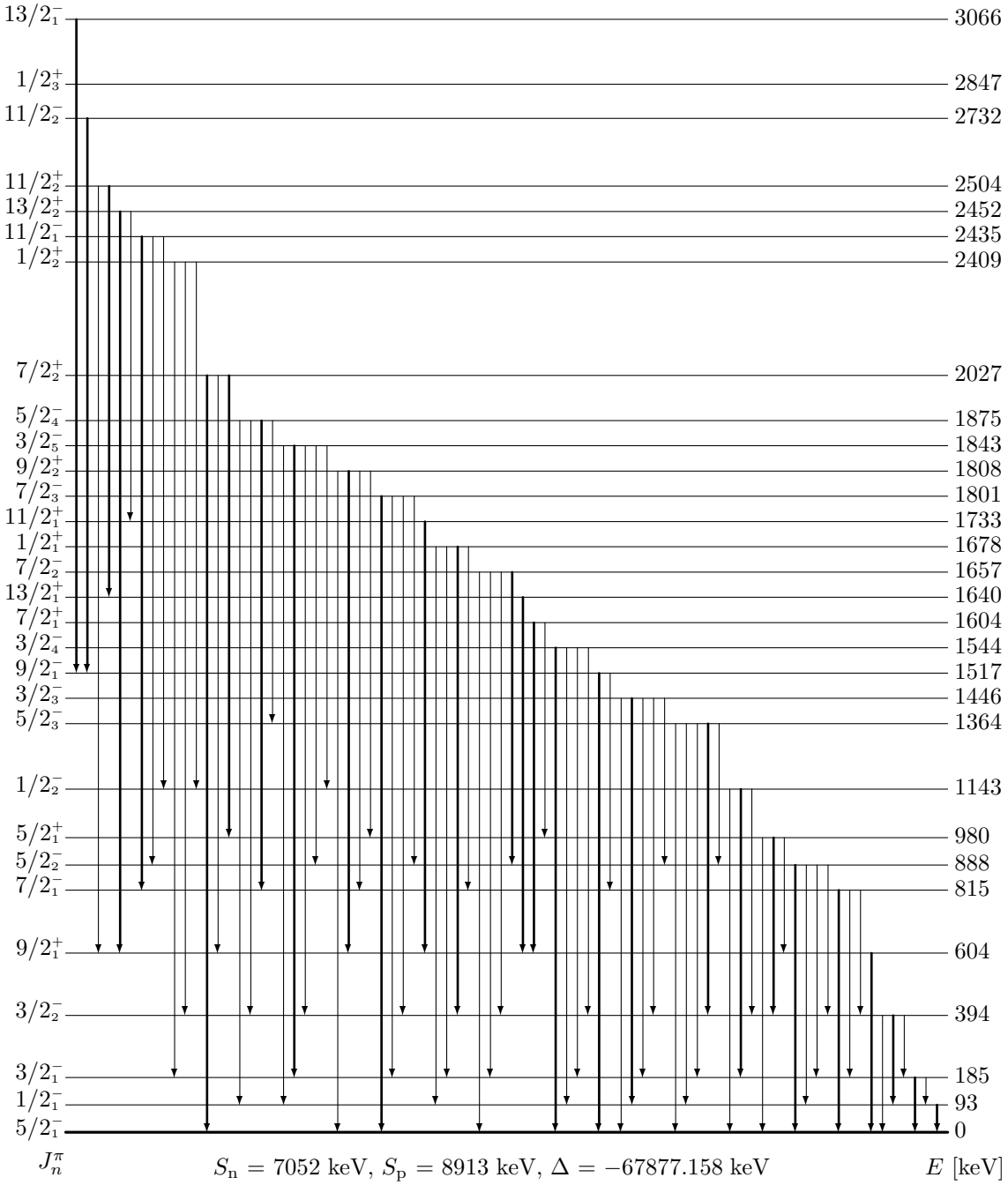
17/2+1 3227
1/2+3 3053
1/2+2 2491
1/2−2 2419
11/2+1 2138
9/2+2 2135
13/2+1 2054
7/2+1 1957
1/2+1 1908
7/2−3 1588
3/2−5 1577
3/2−4 1470
5/2+1 1369
5/2−4 1344
9/2−1 1263
7/2−2 1253
9/2+1 1066
5/2−3 1047
3/2−3 910
1/2−1 867
7/2−1 864
5/2−2 769
3/2−2 207
3/2−1 115
5/2−1 0
J^π_n
S_n = 7980 keV, S_p = 7776 keV, Δ = −65907.775 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93B4, 98B]
$5/2_1^-$	0	244.26 d	$Q = -0.023$ barn, $\mu = 0.7690\ \mu_n$, (p,n), (d,p), (p,d), (^{3}He,α)
$3/2_1^-$	115	444 ps	B(M1/E2$\rightarrow 5/2_1^-$) = 0.022/2.3 · 10^2 W.u. ($\delta = -0.29$), $\mu = -0.78\ \mu_n$, log ft = 4.94 (β^+ from $3/2^-$), (p,n), (d,p), (p,d), (^{3}He,α)
$3/2_2^-$	207	150 ps	B(M1/E2$\rightarrow 5/2_1^-$) = 0.0020/60 W.u. ($\delta = 0.87$), log ft = 5.60 (β^+ from $3/2^-$), $\mu = 0.73\ \mu_n$, (p,n), (d,p), (p,d), (^{3}He,α)
$5/2_2^-$	769	1.3 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.020/2 W.u. ($\delta = -0.14$), B(M1/E2$\rightarrow 5/2_1^-$) = 0.017/13 W.u. ($\delta = 0.51$), log ft = 5.74 (β^+ from $3/2^-$), (p,n), (p,d), (^{3}He,α)
$7/2_1^-$	864	3 ps	B(M1/E2$\rightarrow 5/2_1^-$) = 0.002/2. · 10^1 W.u. ($\delta = -2.27$), B(E2$\rightarrow 3/2_1^-$) = 8 W.u., log ft = 7.32 (β^+ from $3/2^-$), (p,n)
$1/2_1^-$	867	0.55 ps	B(E2$\rightarrow 5/2_1^-$) = 2.1 W.u., log ft = 5.05 (β^+ from $3/2^-$), (p,n), (d,p), (p,d), (^{3}He,α)
$3/2_3^-$	910	1.4 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.007/2.9 W.u. ($\delta = 0.40$), B(M1/E2$\rightarrow 5/2_1^-$) = 0.010/1.2 W.u. ($\delta = 0.25$), log ft = 5.95 (β^+ from $3/2^-$), (p,n), (d,p), (p,d), (^{3}He,α)
$5/2_3^-$	1047	0.37 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.039/13 W.u. ($\delta = -0.42$), log ft = 5.33 (β^+ from $3/2^-$), (p,n), (p,d)
$9/2_1^+$	1066	575 ps	B(M2/E3$\rightarrow 5/2_1^-$) = 0.215/8 W.u. ($\delta = -0.13$), B(E1$\rightarrow 7/2_1^-$) = 8.1 · 10^{-5} W.u., $\mu = -1.73\ \mu_n$, (p,n), (d,p), (p,d), (^{3}He,α)
$7/2_2^-$	1253	1.1 ps	B(M1/E2$\rightarrow 5/2_2^-$) = 0.027/1 W.u. ($\delta = 0.07$), B(E2$\rightarrow 3/2_1^-$) = 3.6 W.u., (p,n), (p,d), (^{3}He,α)
$9/2_1^-$	1263		(p,n), (p,d)
$5/2_4^-$	1344	1.7 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.00399/0.48 W.u. ($\delta = -0.33$), log ft = 5.36 (β^+ from $3/2^-$), (p,n), (p,d)
$5/2_1^+$	1369	1.4 ps	B(E1/M2$\rightarrow 3/2_1^-$) = 9.35 · 10^{-5}/5.3 W.u. ($\delta = -0.14$), B(E1/M2$\rightarrow 5/2_1^-$) = 4.27 · 10^{-5}/1.3 W.u. ($\delta = -0.11$), (p,n), (d,p), (p,d), (^{3}He,α)
$3/2_4^-$	1470	0.16 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.031/1.2 W.u. ($\delta = 0.21$), log ft = 5.10 (β^+ from $3/2^-$), (p,n), (d,p), (p,d), (^{3}He,α)
$3/2_5^-$	1577	0.17 ps	log ft = 6.95 (β^+ from $3/2^-$), (p,n)
$7/2_3^-$	1588	0.15 ps	B(M1/E2$\rightarrow 5/2_2^-$) = 0.025/3.3 W.u. ($\delta = -0.23$), B(M1/E2$\rightarrow 5/2_1^-$) = 0.023/1.4 W.u. ($\delta = 0.31$), B(E2$\rightarrow 3/2_1^-$) = 8 W.u., log ft = 7.40 (β^+ from $3/2^-$), (p,n), (p,d), (^{3}He,α)
$1/2_1^+$	1908		(d,p), (p,d)
$7/2_1^+$	1957	0.42 ps	B(M1/E2$\rightarrow 5/2_1^+$) = 0.054/3.1 W.u. ($\delta = 0.11$), B(M1/E2$\rightarrow 9/2_1^+$) = 0.054/8.2 W.u. ($\delta = -0.27$), (p,n)
$13/2_1^+$	2054	>1.4 ps	B(E2$\rightarrow 9/2_1^+$) < 28 W.u.
$9/2_2^+$	2135	>1.4 ps	
$11/2_1^+$	2138	0.67 ps	B(M1/E2$\rightarrow 9/2_1^+$) = 0.009/25 W.u. ($\delta = 1.4$)
$1/2_2^-$	2419		log ft = 5.12 (β^+ from $3/2^-$), (d,p), (p,d)
$1/2_2^+$	2491		(d,p), (p,d)
$1/2_3^+$	3053		(d,p), (p,d)
$17/2_1^+$	3227	0.30 ps	B(E2$\rightarrow 13/2_1^+$) = 54 W.u.
$1/2_4^+$	3672		(d,p)
$1/2_5^+$	3844		(d,p), (p,d)
$1/2_6^+$	4350		(d,p), (p,d)
$1/2_7^+$	4393		(d,p)
$1/2_8^+$	4740		(d,p), (p,d)

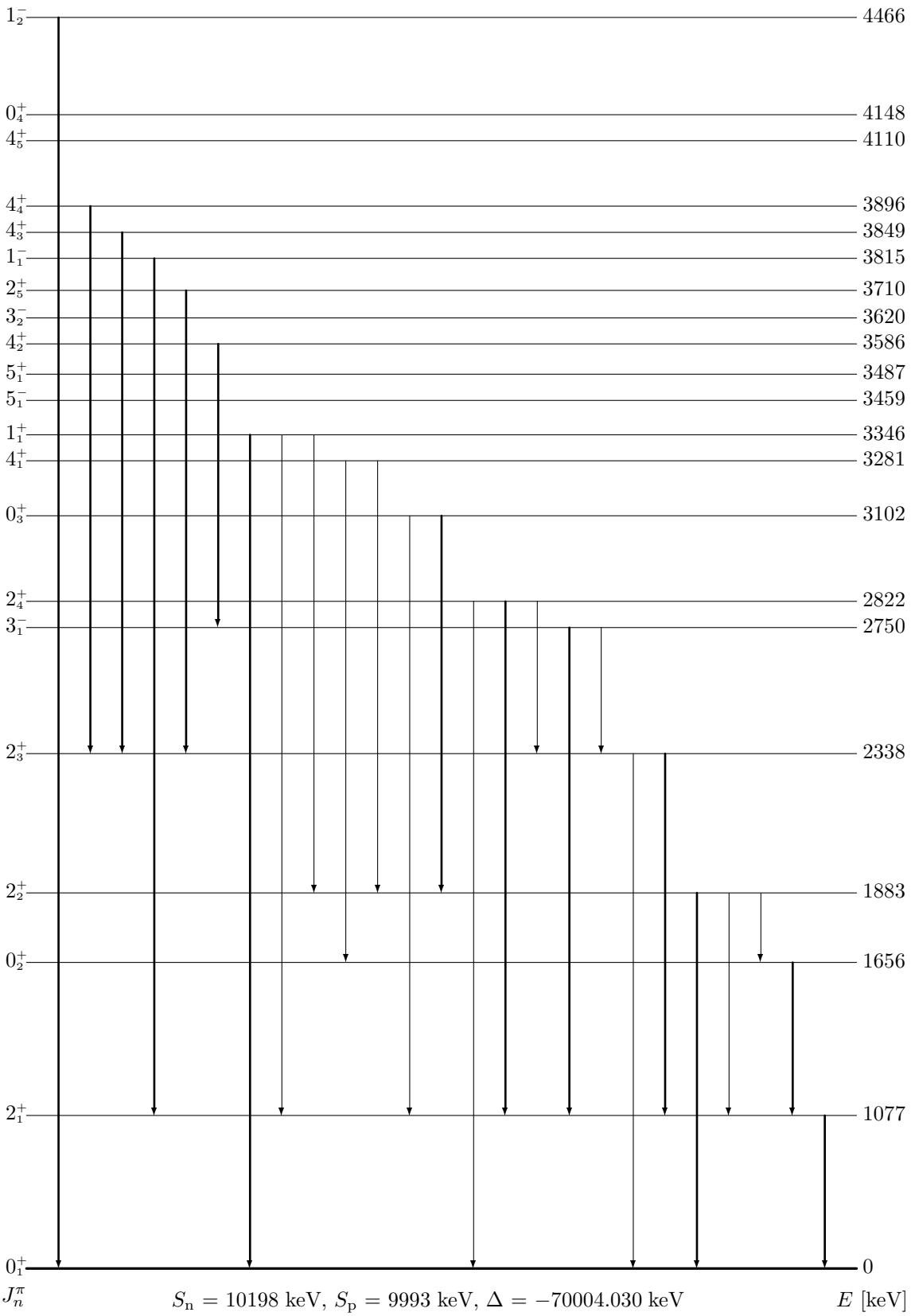

1_4^+ 4807
5_3^- 4567
0_5^+ 4511
1_3^+ 4462
1_1^- 4433
3_2^- 4394
2_9^+ 4332
1_2^+ 4296
2_8^+ 4020
5_2^- 3899
1_1^+ 3792
5_1^- 3747
2_7^+ 3670
0_4^+ 3532
2_6^+ 3332
2_5^+ 3213
0_3^+ 3105
4_3^+ 3078
2_4^+ 2938
3_1^- 2827
2_3^+ 2781
4_2^+ 2766
4_1^+ 2451
0_2^+ 2373
2_2^+ 1873
2_1^+ 1039
0_1^+ 0
J_n^π
S_n = 11060 keV, S_p = 8927 keV, Δ = −68896.301 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [90B, 98B]
0_1^+	0	stable	log $ft = 5.32$ (β^- from 1^+), log $ft = 7.89$ (β^+ from 0^+), (γ,γ'), Coul. ex., (e,e′), (p,p′), (α,α'), (p,γ), (d,n), (p,d), (d,t), (p,n), (p,t), (t,p)
2_1^+	1039	1.65 ps	B(E2→ 0_1^+) = 17.9 W.u., log $ft = 5.53$ (β^- from 1^+), $\mu = 0.52\ \mu_n$
2_2^+	1873	0.19 ps	B(M1/E2→ 2_1^+) = $0.043/3.7 \cdot 10^2$ W.u. ($\delta = -1.9$), log $ft = 5.96$ (β^- from 1^+), log $ft = 9.30$ (β^+ from 0^+), (γ,γ'), (e,e′), (p,p′), (α,α'), (p,γ), (d,n), (p,d), (d,t), (t,p)
0_2^+	2373		log $ft = 6.14$ (β^- from 1^+), log $ft = 8.40$ (β^+ from 0^+), (γ,γ'), (p,p′), (p,γ), (d,n), (t,p)
4_1^+	2451	0.18 ps	B(E2→ 2_1^+) = 35 W.u., (p,p′), (α,α'), (p,γ), (d,n), (p,d), (d,t), (t,p)
4_2^+	2766	>7 ps	B(E2→ 2_2^+) < 4.1 W.u., B(E2→ 2_1^+) < 0.13 W.u., (p,p′), (p,γ), (p,d), (p,t)
2_3^+	2781	0.26 ps	B(E2→ 0_1^+) = 0.55 W.u., log $ft = 8.69$ (β^+ from 0^+), (γ,γ'), (p,p′), (p,γ), (p,d), (d,t), (p,t), (t,p)
3_1^-	2827	0.18 ps	B(E1→ 2_1^+) = 0.00036 W.u., (e,e′), (p,p′), (α,α'), (p,γ), (d,n), (t,p)
2_4^+	2938	0.044 ps	B(M1/E2→ 2_1^+) = 0.021/10 W.u., log $ft = 8.40$ (β^+ from 0^+), (γ,γ'), (p,p′), (p,γ), (p,d), (d,t), (t,p)
4_3^+	3078		(p,p′), (α,α'), (p,γ), (p,d), (d,t), (t,p)
0_3^+	3105		(γ,γ'), (p,p′), (p,γ), (t,p)
2_5^+	3213	0.083 ps	(γ,γ'), (p,p′), (p,γ), (p,d), (t,p)
2_6^+	3332	0.083 ps	log $ft = 7.74$ (β^+ from 0^+), (γ,γ'), (p,p′), (p,γ), (d,n), (p,d), (d,t), (t,p)
0_4^+	3532		(γ,γ'), (p,p′), (p,γ), (t,p)
2_7^+	3670		(p,p′), (p,γ), (p,d), (t,p)
5_1^-	3747	46 ps	B(E1→ 4_3^+) = $5.1 \cdot 10^{-6}$ W.u., B(E2→ 3_1^-) = 0.10 W.u., B(E1/M2→ 4_1^+) = $3.1 \cdot 10^{-6}/0.013$ W.u. ($\delta = -0.04$), (p,p′), (p,γ)
1_1^+	3792		log $ft = 4.99$ (β^+ from 0^+), (p,p′), (p,γ), (p,d), (d,t)
5_2^-	3899		(p,p′), (α,α'), (p,γ), (t,p)
2_8^+	4020		(p,p′), (p,γ), (t,p)
1_2^+	4296	4.2 fs	log $ft = 5.21$ (β^+ from 0^+), (γ,γ'), (p,p′), (p,d)
2_9^+	4332		(p,p′), (t,p)
3_2^-	4394	0.07 ps	(p,p′), (α,α'), (t,p)
1_1^-	4433		(p,p′), (t,p)
1_3^+	4462	7 fs	log $ft = 5.56$ (β^+ from 0^+), (γ,γ'), (p,p′)
0_5^+	4511		(p,p′), (t,p)
5_3^-	4567		(t,p)
1_4^+	4807	3.8 fs	log $ft = 4.91$ (β^+ from 0^+), (γ,γ'), (p,p′)



J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [91B, 98B]
$5/2_1^-$	0	stable	log ft = 6.30 (β^- from $3/2^-$), Q = 0.150 barn, μ = 0.8754790 μ_n
$1/2_1^-$	93	9.16 μs	B(E2→ $5/2_1^-$) = 0.287 W.u., log ft = 6.00 (β^- from $3/2^-$), log ft = 5.24 (β^+ from $3/2^-$), μ = 0.587 μ_n, (γ,γ'), Coul. ex., (p,p′), (d,p), (p,d), (d,t)

J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [91B, 98B]
$3/2^-_1$	185	1.04 ns	B(M1/E2→ $5/2^-_1$) = 0.00257/14 W.u. ($\delta = 0.34$), B(M1→ $1/2^-_1$) = 0.00342 W.u., log ft = 5.20 (β^- from $3/2^-$), log ft = 5.52 (β^+ from $3/2^-$), μ = 0.50 μ_n, Coul. ex., (p,p′), (d,p), (p,d), (d,t)
$3/2^-_2$	394	>2.4 ps	log ft = 5.80 (β^- from $3/2^-$), log ft = 5.24 (β^+ from $3/2^-$), Coul. ex., (p,p′), (d,d′), (d,p), (p,d), (d,t)
$9/2^+_1$	604	333 ns	B(M2/E3→ $5/2^-_1$) = 0.054/105 W.u. (δ = 0.54), Q = 0.60 barn, $\mu = -1.097\ \mu_n$, (d,d′), (d,p), (p,d), (d,t)
$7/2^-_1$	815	2.0 ps	B(E2→ $3/2^-_1$) = 9 W.u., B(M1/E2→ $5/2^-_1$) = 0.0006/4. · 10^1 W.u. ($\delta = 5.5$), Coul. ex.
$5/2^-_2$	888	1.6 ps	B(M1/E2→ $3/2^-_2$) = 0.028/3.6 W.u. ($\delta = -0.14$), B(M1/E2→ $3/2^-_1$) = 0.0010/3.1 W.u., B(E2→ $1/2^-_1$) = 15 W.u., B(M1/E2→ $5/2^-_1$) = 0.005/9 W.u. ($\delta = 0.96$), log ft = 5.64 (β^+ from $3/2^-$), Coul. ex., (p,p′), (α,α'), (d,p), (d,t)
$5/2^+_1$	980	1.5 ps	B(E2→ $9/2^+_1$) = 7. · 10^1 W.u., B(E1→ $3/2^-_2$) = 0.0009 W.u., B(E1→ $5/2^-_1$) = 9. · 10^{-5} W.u., (d,p), (d,t)
$1/2^-_2$	1143	0.42 ps	B(E2→ $5/2^-_1$) = 3.9 W.u., (p,p′), (d,d′), (α,α'), (d,p), (p,d), (d,t), (^{3}He,p)
$5/2^-_3$	1364	0.18 ps	B(M1/E2→ $5/2^-_2$) = 0.08/7. · 10^1 W.u. ($\delta = -0.37$), B(M1/E2→ $3/2^-_2$) = 0.043/7 W.u. ($\delta = -0.31$), B(M1/E2→ $5/2^-_1$) = 0.0026/9 W.u. ($\delta = 2.0$), B(M1→ $3/2^-_1$) = 0.019 W.u., (d,p), (d,t), (^{3}He,p)
$3/2^-_3$	1446	0.5 ps	(d,p), (d,t)
$9/2^-_1$	1517	0.21 ps	B(E2→ $5/2^-_1$) = 19 W.u., (d,p)
$3/2^-_4$	1544	0.19 ps	B(M1/E2→ $5/2^-_1$) = 0.016/0.4 W.u. ($\delta = 0.20$), (d,p), (d,t), (^{3}He,p)
$7/2^+_1$	1604	0.42 ps	B(M1/E2→ $5/2^+_1$) = 0.033/0.7 W.u. ($\delta = 0.07$), B(M1/E2→ $9/2^+_1$) = 0.041/5 W.u. ($\delta = -0.28$), (d,d′), (d,p), (p,d)
$13/2^+_1$	1640	0.83 ps	B(E2→ $9/2^+_1$) = 35.4 W.u., (p,p′), (α,α')
$7/2^-_2$	1657	0.42 ps	B(M1→ $5/2^-_2$) = 0.047 W.u., B(E2→ $3/2^-_1$) = 1.3 W.u., (^{3}He,p)
$1/2^+_1$	1678	0.15 ps	(d,p), (d,t)
$11/2^+_1$	1733	0.48 ps	B(M1/E2→ $9/2^+_1$) = 0.019/16 W.u. ($\delta = 0.80$)
$7/2^-_3$	1801	0.12 ps	B(M1→ $5/2^-_2$) = 0.065 W.u., B(M1/E2→ $5/2^-_1$) = 0.009/0.6 W.u. ($\delta = -0.38$), (^{3}He,p)
$9/2^+_2$	1808	>0.7 ps	B(M1/E2→ $9/2^+_1$) < 0.0020/ < 10 W.u. ($\delta = 3$)
$3/2^-_5$	1843	0.17 ps	(d,p), (d,t)
$5/2^-_4$	1875	0.13 ps	B(M1/E2→ $3/2^-_2$) = 0.007/3.1 W.u. ($\delta = -0.8$), B(M1/E2→ $7/2^-_1$) = 0.11/6 W.u. ($\delta = -0.2$), (d,p), (p,d), (^{3}He,p)
$7/2^+_2$	2027	1.2 ps	B(M1/E2→ $5/2^+_1$) = 0.0037/3.8 W.u. ($\delta = 0.84$), B(M1→ $9/2^+_1$) = 0.0013 W.u., (d,p)
$1/2^+_2$	2409		(d,p)
$11/2^-_1$	2435	0.30 ps	B(E2→ $7/2^-_1$) = 6 W.u., (^{3}He,p)
$13/2^+_2$	2452	0.8 ps	
$11/2^+_2$	2504	0.38 ps	B(M1/E2→ $13/2^+_1$) = 0.030/64 W.u.
$11/2^-_2$	2732	0.41 ps	B(M1/E2→ $9/2^-_1$) = 0.015/16 W.u., (d,p)
$1/2^+_3$	2847		(d,d′), (d,p), (p,d), (^{3}He,p)
$13/2^-_1$	3066	0.28 ps	B(E2→ $9/2^-_1$) = 13.9 W.u.
$1/2^+_4$	3291		(d,p)
$1/2^+_5$	3386		(d,p)
$1/2^+_6$	3557		(d,p)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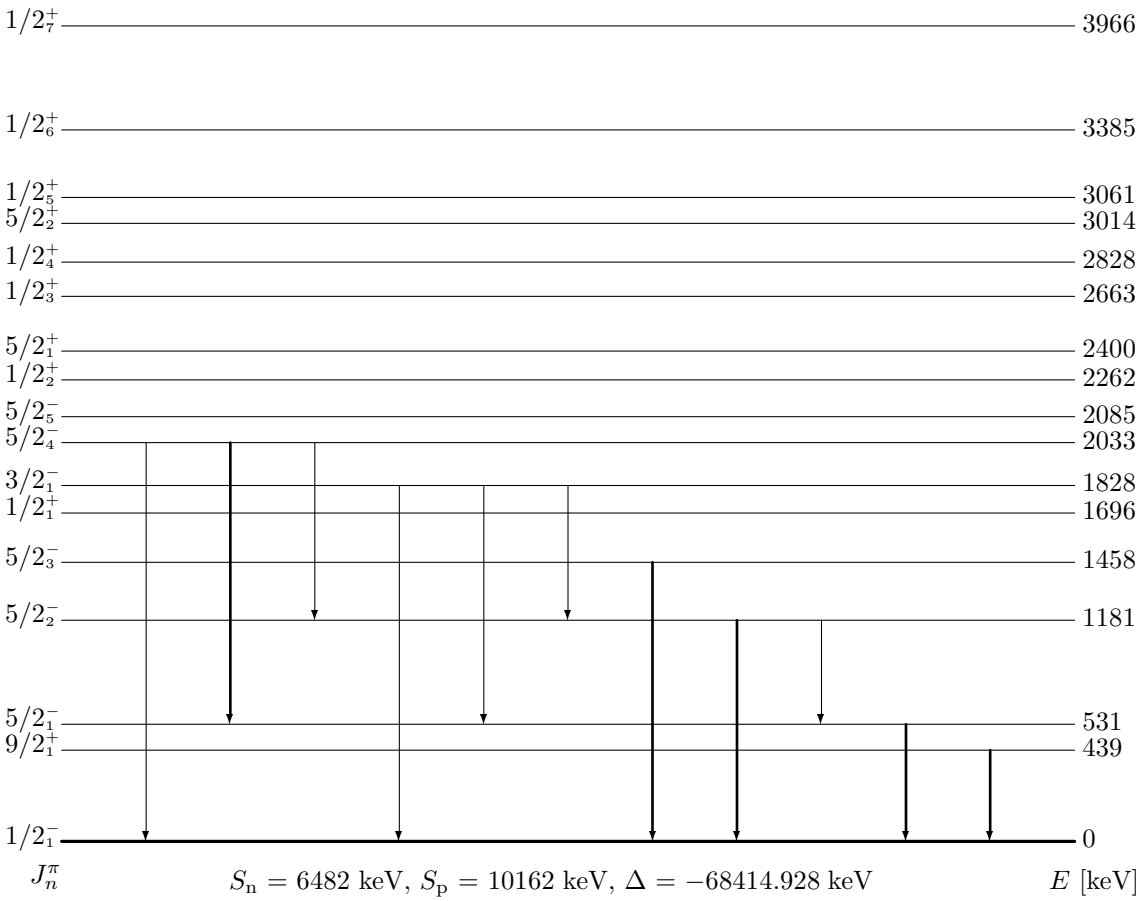
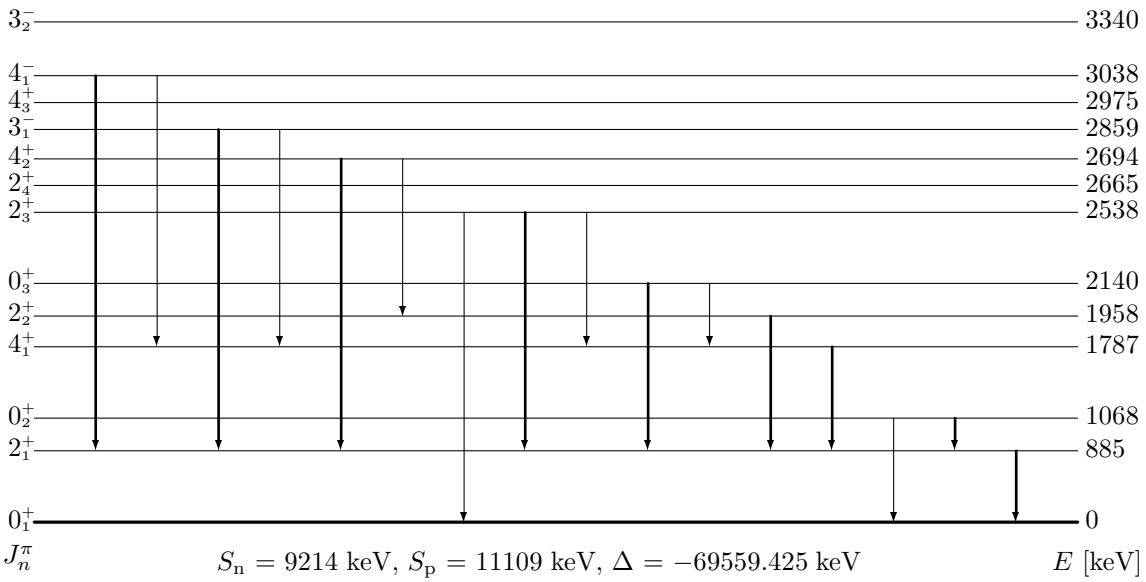
4_5^+ 4110
4_4^+ 3896
4_3^+ 3849
1_1^- 3815
2_5^+ 3710
3_2^- 3620
4_2^+ 3586
5_1^+ 3487
5_1^- 3459
1_1^+ 3346
4_1^+ 3281
0_3^+ 3102
2_4^+ 2822
3_1^- 2750
2_3^+ 2338
2_2^+ 1883
0_2^+ 1656
2_1^+ 1077
0_1^+ 0
J_n^π
S_n = 10198 keV, S_p = 9993 keV, Δ = −70004.030 keV
E [keV]

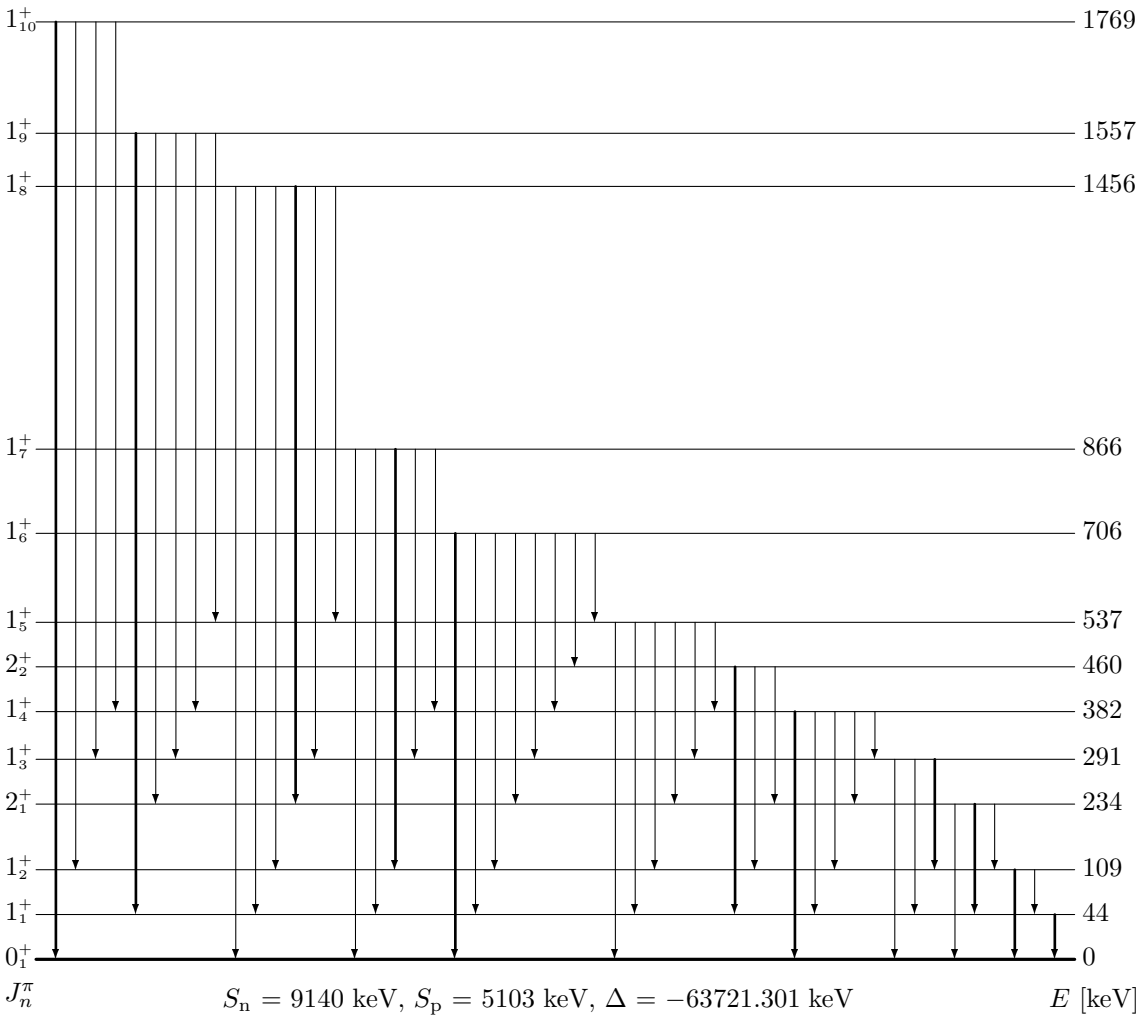
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95B4, 98B]
0_1^+	0	stable	log ft = 5.77 (β^- from 1^+), log ft = 5.19 (β^+ from 1^+), (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (d,p), (d,^{3}He), (p,t), (t,p)
2_1^+	1077	1.51 ps	B(E2→ 0_1^+) = 15.7 W.u., log ft = 5.13 (β^- from 1^+), log ft = 5.52 (β^+ from 1^+), (γ,γ'), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (d,p), (d,^{3}He), (p,t), (t,p)
0_2^+	1656	70 ps	B(E2→ 2_1^+) = 8 W.u., log ft = 6.18 (β^- from 1^+), log ft = 6.93 (β^+ from 1^+), (γ,γ'), (p,p′), (d,d′), (α,α'), (d,^{3}He), (p,t), (t,p)
2_2^+	1883	1.6 ps	B(E2→ 0_2^+) = 9 W.u., B(M1/E2→ 2_1^+) = 0.0033/17 W.u. (δ = −1.46), B(E2→ 0_1^+) = 0.55 W.u., log ft = 5.68 (β^- from 1^+), log ft = 5.89 (β^+ from 1^+), (e,e′), (p,p′), (d,d′), (α,α'), (d,p), (d,^{3}He), (p,t), (t,p)
2_3^+	2338	0.24 ps	B(M1/E2→ 2_1^+) = 0.044/1.2 W.u. (δ = −0.17), B(E2→ 0_1^+) = 0.034 W.u., log ft = 4.75 (β^- from 1^+), log ft = 6.90 (β^- from (6^-)), log ft = 5.81 (β^+ from 1^+), (p,p′), (α,α'), (d,p), (d,^{3}He), (p,t), (t,p)
3_1^-	2750	0.44 ps	B(E1→ 2_3^+) = 0.00094 W.u., B(E1→ 2_1^+) = 0.00018 W.u., (e,e′), (p,p′), (d,d′), (α,α'), (d,p), (p,t), (t,p)
2_4^+	2822	0.15 ps	B(M1/E2→ 2_1^+) = 0.023/0.9 W.u. (δ = 0.28), B(E2→ 0_1^+) = 0.11 W.u., log ft = 5.20 (β^- from 1^+), log ft = 5.14 (β^+ from 1^+), (γ,γ'), (p,p′), (d,p), (d,^{3}He), (p,t), (t,p)
0_3^+	3102		(p,p′), (t,p)
4_1^+	3281		(d,^{3}He), (p,t), (t,p)
1_1^+	3346	8.4 fs	B(M1→ 0_1^+) = 0.043 W.u., (γ,γ'), (p,p′), (d,^{3}He), (p,t)
5_1^-	3459		log ft = 5.88 (β^- from (6^-)), (p,p′), (α,α'), (d,p), (p,t), (t,p)
5_1^+	3487		(d,^{3}He), (t,p)
4_2^+	3586		(p,p′), (d,d′), (α,α'), (d,p), (p,t), (t,p)
3_2^-	3620		(p,p′), (t,p)
2_5^+	3710		(p,p′), (p,t), (t,p)
1_1^-	3815	24 fs	B(E1→ 0_1^+) = 8. · 10^{-5} W.u., (d,p)
4_3^+	3849	0.16 ps	B(E2→ 2_3^+) = 3.1 W.u., (p,p′), (α,α'), (d,p), (t,p)
4_4^+	3896		(p,p′), (p,t), (t,p)
4_5^+	4110		(p,t)
0_4^+	4148		(p,p′), (d,d′), (t,p)
1_2^-	4466	7.0 fs	B(E1→ 0_1^+) = 0.00065 W.u., (γ,γ'), (d,p)
1_3^-	7362	0.240 fs	(γ,γ')



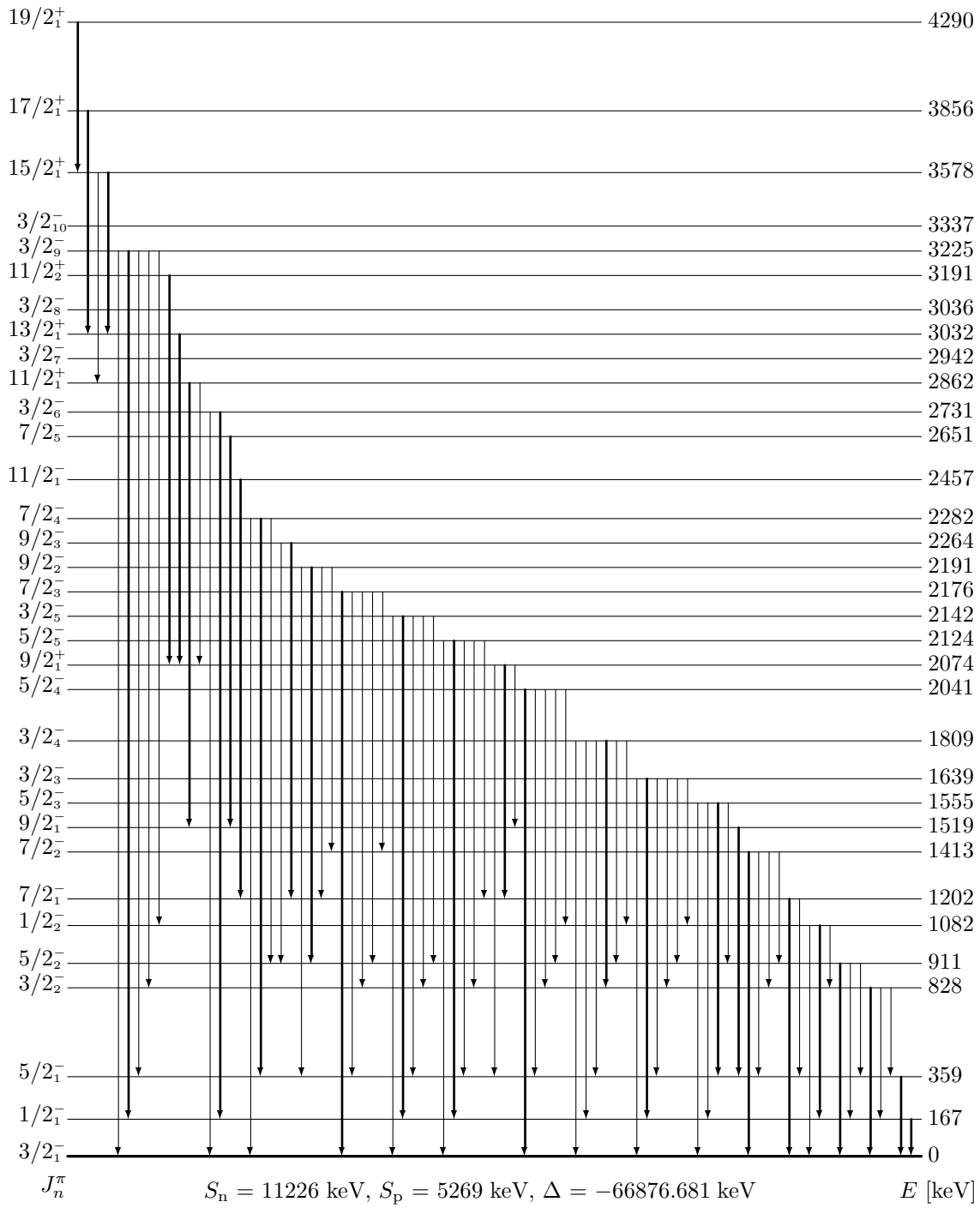
J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [89B, 98B]
$1/2^-_1$	0	56.4 m	log ft = 5.35 (β^- from $3/2^-$), (d,p), (p,d), (d,t), (t,p)
$9/2^+_1$	439	13.76 h	B(M4→ $1/2^-_1$) = 1.412 W.u., (d,p), (p,d), (d,t), (t,p), Q = −0.45 barn
$5/2^-_1$	531		log ft = 6.25 (β^- from $3/2^-$), (d,p), (p,d), (d,t), (t,p)
$5/2^-_2$	1181		log ft = 5.39 (β^- from $3/2^-$), (p,d), (t,p)
$5/2^-_3$	1458		log ft = 7.21 (β^- from $3/2^-$), (t,p)
$1/2^+_1$	1696		(d,p)
$3/2^-_1$	1828		log ft = 4.81 (β^- from $3/2^-$), (d,p), (t,p)
$5/2^-_4$	2033		log ft = 4.96 (β^- from $3/2^-$), (t,p)
$5/2^-_5$	2085		(t,p)
$1/2^+_2$	2262		(d,p), (t,p)
$5/2^+_1$	2400		(d,p)
$1/2^+_3$	2663		(d,p)
$1/2^+_4$	2828		(d,p)
$5/2^+_2$	3014		(d,p)
$1/2^+_5$	3061		(d,p)
$1/2^+_6$	3385		(d,p)
$1/2^+_7$	3966		(d,p)



J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93B2, 98B]
0^+_1	0	$5{\cdot}10^{14}$ y	log ft = 5.55 (β^- from (1^+)), log ft = 4.72 (β^+ from 1^+), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (d,^{3}He), (t,p)
2^+_1	885	2.9 ps	B(E2→ 0^+_1) = 21.0 W.u., log ft = 5.20 (β^- from (1^+)), Q = −0.233 barn, μ = 0.60 μ_n, Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (d,^{3}He), (t,p)
0^+_2	1068	3.90 ns	B(E2→ 2^+_1) = 37.3 W.u., (p,p′), (d,^{3}He), (t,p)
4^+_1	1787		log ft = 6.19 (β^- from (5^-)), (p,p′), (d,^{3}He), (t,p)
2^+_2	1958		(p,p′), (α,α'), (d,^{3}He), (t,p)
0^+_3	2140		(p,p′), (d,^{3}He), (t,p)
2^+_3	2538	0.21 ps	B(E2→ 4^+_1) = 73 W.u., B(M1/E2→ 2^+_1) = 0.0036/4.4 W.u. (δ = −1.5), B(E2→ 0^+_1) = 0.15 W.u., (p,p′), (d,^{3}He)
2^+_4	2665		(p,p′), (d,^{3}He), (t,p)
4^+_2	2694	0.3 ps	B(E2→ 2^+_2) = 39 W.u., B(E2→ 2^+_1) = 4.0 W.u., (p,p′), (t,p)
3^-_1	2859		(p,p′), (α,α'), (t,p)
4^+_3	2975		(p,p′), (t,p)
4^-_1	3038		log ft = 5.32 (β^- from (5^-)), (p,p′), (α,α'), (d,^{3}He), (t,p)
3^-_2	3340		(α,α'), (t,p)
4^+_4	3464		(p,p′), (α,α'), (t,p)
5^-_1	3506		(p,p′), (d,^{3}He), (t,p)
2^+_5	3635		(p,p′), (d,^{3}He), (t,p)
0^+_4	3680		(p,p′), (α,α'), (d,^{3}He), (t,p)
2^+_6	3711		(p,p′), (t,p)
1^-_1	3844		(p,p′), (α,α'), (t,p)
1^-_2	3948		(p,p′), (t,p)
2^+_7	3999		(α,α'), (t,p)
4^+_5	4063		(p,p′), (t,p)
2^+_8	4297		(p,p′), (t,p)

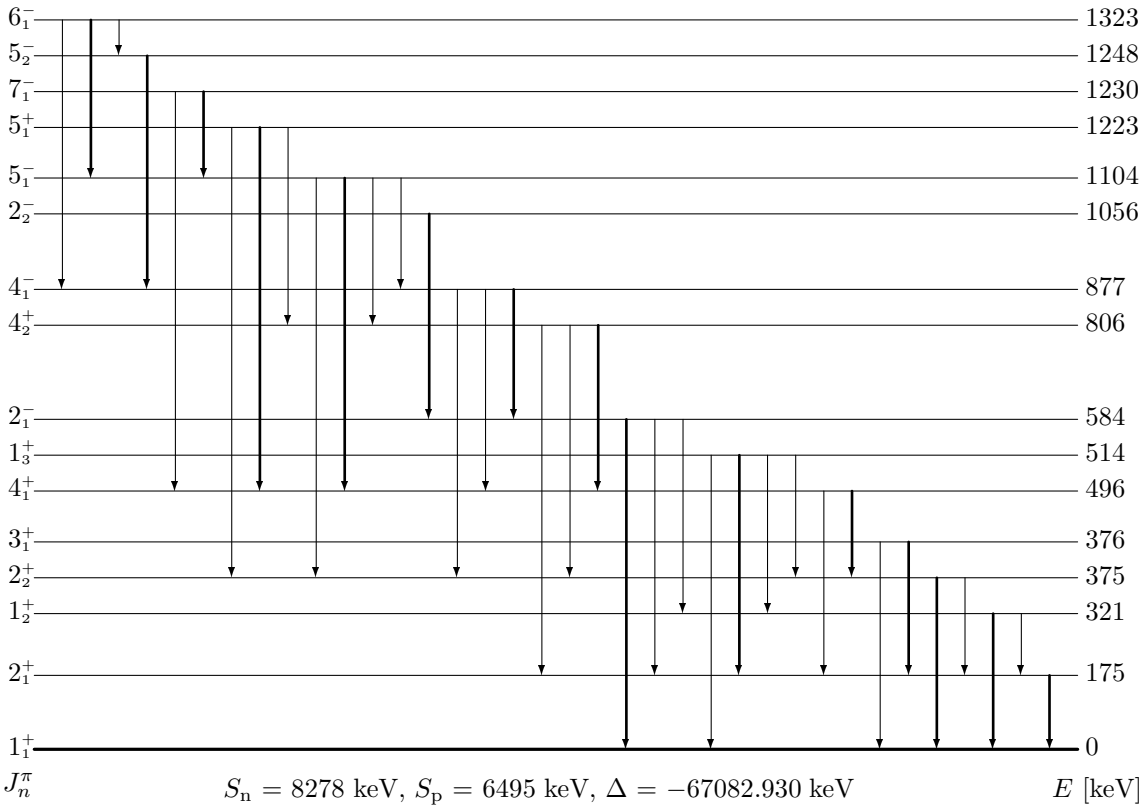


J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [90B, 98B]
0^+_1	0	9.49 h	(^{3}He,t)
1^+_1	44	18.0 ns	B(M1→ 0^+_1) = 0.0085 W.u., log ft = 5.42 (β^+ from 0^+)
1^+_2	109	1.2 ns	B(M1/E2→ 1^+_1) > 0.015/ < 13 W.u. (δ = 0.04), B(M1→ 0^+_1) = 0.0070 W.u., log ft = 6.50 (β^+ from 0^+), (α,d)
2^+_1	234		
1^+_3	291		
1^+_4	382		log ft = 4.47 (β^+ from 0^+)
2^+_2	460		
1^+_5	537		log ft = 4.65 (β^+ from 0^+)
1^+_6	706		log ft = 4.89 (β^+ from 0^+)
1^+_7	866		log ft = 5.84 (β^+ from 0^+)
1^+_8	1456		log ft = 5.06 (β^+ from 0^+)
1^+_9	1557		log ft = 4.87 (β^+ from 0^+)
1^+_{10}	1769		log ft = 5.35 (β^+ from 0^+)

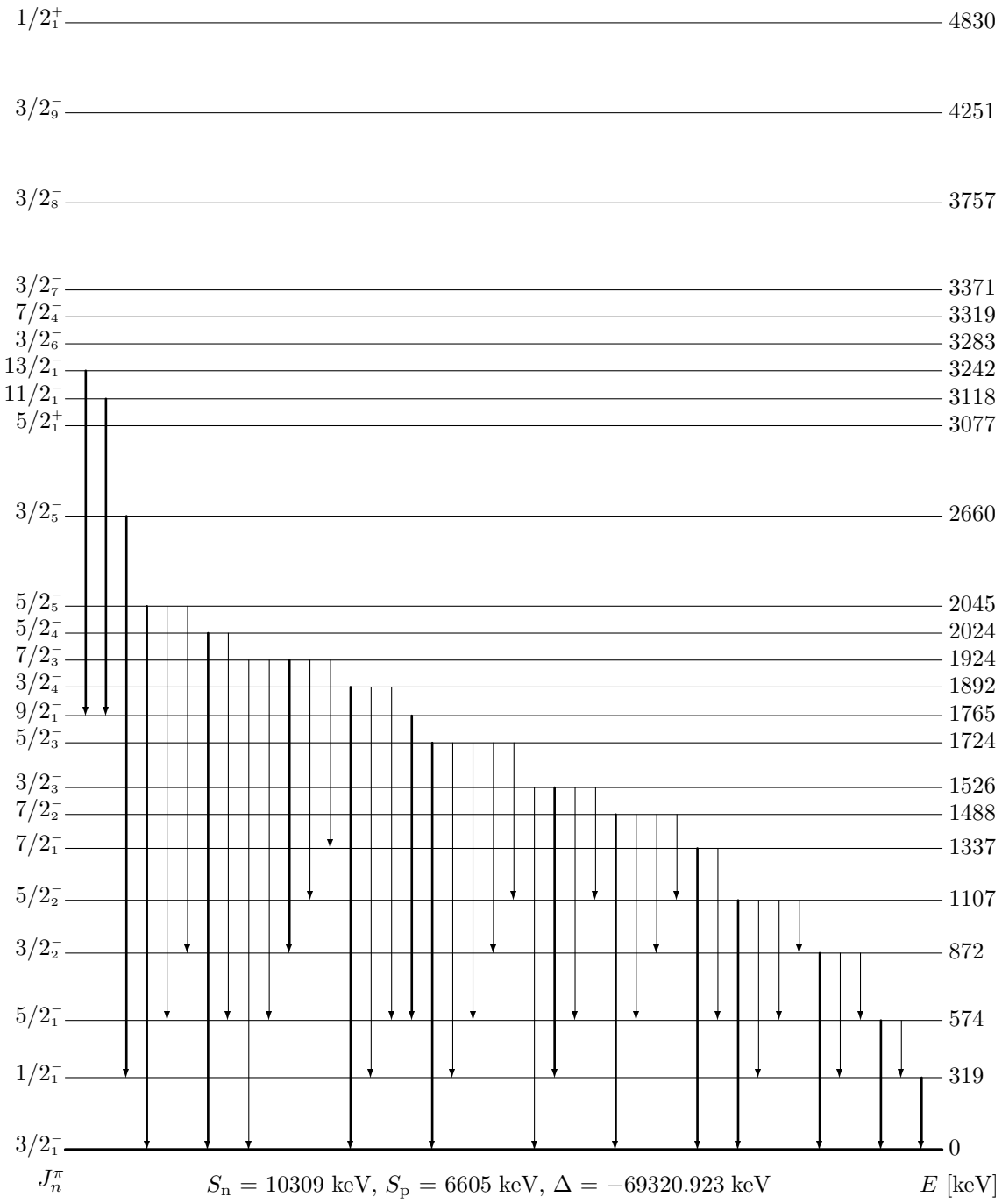


J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [91B, 98B]
$3/2^-_1$	0	3.2612 d	Q = −0.195 barn, μ = 1.8507 μ_n
$1/2^-_1$	167	42 ns	log ft = 5.61 (β^+ from $1/2^-$), (p,n), (d,n), (^{3}He,d), (p,t)

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [91B, 98B]
$5/2_1^-$	359	49 ps	B(M1/E2→ $3/2_1^-$) = 0.0096/0.76 W.u. ($\delta = -0.08$), $\mu = 1.40\ \mu_n$, (p,n), (d,n), (^{3}He,d), (p,t)
$3/2_2^-$	828	0.16 ps	B(M1/E2→ $1/2_1^-$) = 0.038/18 W.u. ($\delta = -0.36$), B(M1/E2→ $3/2_1^-$) = 0.21/9 W.u. ($\delta = -0.14$), log ft = 6.98 (β^+ from $1/2^-$), (p,n), (d,n), (^{3}He,d), (p,t)
$5/2_2^-$	911	0.25 ps	B(M1→ $5/2_1^-$) = 0.010 W.u., B(E2→ $1/2_1^-$) = 13 W.u., B(M1/E2→ $3/2_1^-$) = 0.10/20 W.u. ($\delta = 0.32$), (p,n), (p,t)
$1/2_2^-$	1082	0.28 ps	B(M1→ $1/2_1^-$) = 0.07 W.u., log ft = 6.24 (β^+ from $1/2^-$), (p,n), (d,n), (^{3}He,d), (p,t)
$7/2_1^-$	1202	1.5 ps	B(M1/E2→ $5/2_1^-$) = 0.0005/10 W.u. ($\delta = -3.08$), (p,n), (^{3}He,d), B(E2→ $3/2_1^-$) = 7 W.u., log ft = 8.60 (β^+ from $1/2^-$), (d,n), (p,t)
$7/2_2^-$	1413	0.61 ps	B(M1/E2→ $5/2_2^-$) = 0.032/2.5 W.u. ($\delta = -0.11$), B(M1/E2→ $5/2_1^-$) = 0.0018/10 W.u. ($\delta = -2.0$), (^{3}He,d), (p,t), B(E2→ $3/2_2^-$) = 28 W.u., B(E2→ $3/2_1^-$) = 5.8 W.u., (p,n), (d,n)
$9/2_1^-$	1519	1.9 ps	B(E2→ $5/2_1^-$) = 9 W.u., (p,n)
$5/2_3^-$	1555	0.18 ps	B(M1/E2→ $5/2_1^-$) = 0.024/11 W.u. ($\delta = -0.65$), B(M1/E2→ $3/2_1^-$) = 0.012/1.4 W.u. ($\delta = 0.42$), B(E2→ $1/2_1^-$) = 2.5 W.u., log ft = 7.92 (β^+ from $1/2^-$), (p,n), (d,n), (^{3}He,d), (p,t)
$3/2_3^-$	1639	0.14 ps	B(M1/E2→ $1/2_1^-$) = 0.026/0.49 W.u. ($\delta = -0.16$), (p,n), B(M1→ $5/2_1^-$) = 0.0016 W.u., log ft = 5.32 (β^+ from $1/2^-$), (p,t)
$3/2_4^-$	1809	0.23 ps	B(M1→ $5/2_2^-$) = 0.014 W.u., B(M1→ $3/2_2^-$) = 0.02 W.u., B(M1→ $5/2_1^-$) = 0.0015 W.u., B(M1→ $3/2_1^-$) = 0.0035 W.u., log ft = 5.36 (β^+ from $1/2^-$), (p,n), (d,n), (^{3}He,d), (p,t)
$5/2_4^-$	2041	0.09 ps	B(M1/E2→ $3/2_1^-$) = 0.015/2.8 W.u. ($\delta = -0.7$), B(E2→ $1/2_2^-$) = 20 W.u., (p,n), (^{3}He,d), (p,t)
$9/2_1^+$	2074		(p,n), (d,n), (^{3}He,d)
$5/2_5^-$	2124	0.21 ps	B(M1→ $5/2_1^-$) = 0.00021 W.u., B(E2→ $1/2_1^-$) = 2.7 W.u., B(M1/E2→ $3/2_2^-$) < 0.024/ > 0.18 W.u. ($\delta = 0.2$), (p,n), (p,t)
$3/2_5^-$	2142	≥0.25 ps	B(M1→ $1/2_1^-$) < 0.0037 W.u., (p,n), (p,t)
$7/2_3^-$	2176	0.06 ps	B(E2→ $3/2_2^-$) = 7 W.u., B(M1→ $5/2_1^-$) = 0.020 W.u., B(E2→ $3/2_1^-$) = 6.3 W.u., (p,n), (d,n)
$9/2_2^-$	2191	0.68 ps	B(E2→ $5/2_2^-$) = 7.3 W.u., B(E2→ $5/2_1^-$) = 0.065 W.u., B(M1/E2→ $7/2_2^-$) = 0.019/0.18 W.u. ($\delta = -0.06$), (p,n), (^{3}He,d)
$9/2_3^-$	2264	0.68 ps	B(M1/E2→ $7/2_1^-$) = 0.0022/18 W.u. ($\delta = -2.4$), B(E2→ $5/2_2^-$) = 5.1 W.u., (p,n), (p,t)
$7/2_4^-$	2282	0.06 ps	(p,n)
$11/2_1^-$	2457	>1.04 ps	(p,n), (^{3}He,d), (p,t)
$7/2_5^-$	2651	>1.04 ps	(p,n)
$3/2_6^-$	2731		(p,n), (p,t)
$11/2_1^+$	2862	0.87 ps	B(M1→ $9/2_1^+$) = 0.016 W.u., B(E1→ $9/2_1^-$) = 0.00013 W.u.
$3/2_7^-$	2942		(p,n), (^{3}He,d), (p,t)
$13/2_1^+$	3032	4.5 ps	B(E2→ $9/2_1^+$) = 9.6 W.u.
$3/2_8^-$	3036		(p,n), (p,t)
$11/2_2^+$	3191	>1.04 ps	B(M1/E2→ $9/2_1^+$) < 0.0045/ < 14 W.u. ($\delta = -1.60$), (p,n), (d,n)
$3/2_9^-$	3225		log ft = 5.04 (β^+ from $1/2^-$), (p,n), (^{3}He,d), (p,t)
$3/2_{10}^-$	3337		(p,t)
$15/2_1^+$	3578	0.16 ns	B(M1/E2→ $13/2_1^+$) = 0.00073/0.20 W.u. ($\delta = -0.23$), $\mu = -1.69\ \mu_n$
$17/2_1^+$	3856	11 ps	B(E2→ $13/2_1^+$) = 8.4 W.u.
$19/2_1^+$	4290	12.5 ps	B(E2→ $15/2_1^+$) = 15.2 W.u.

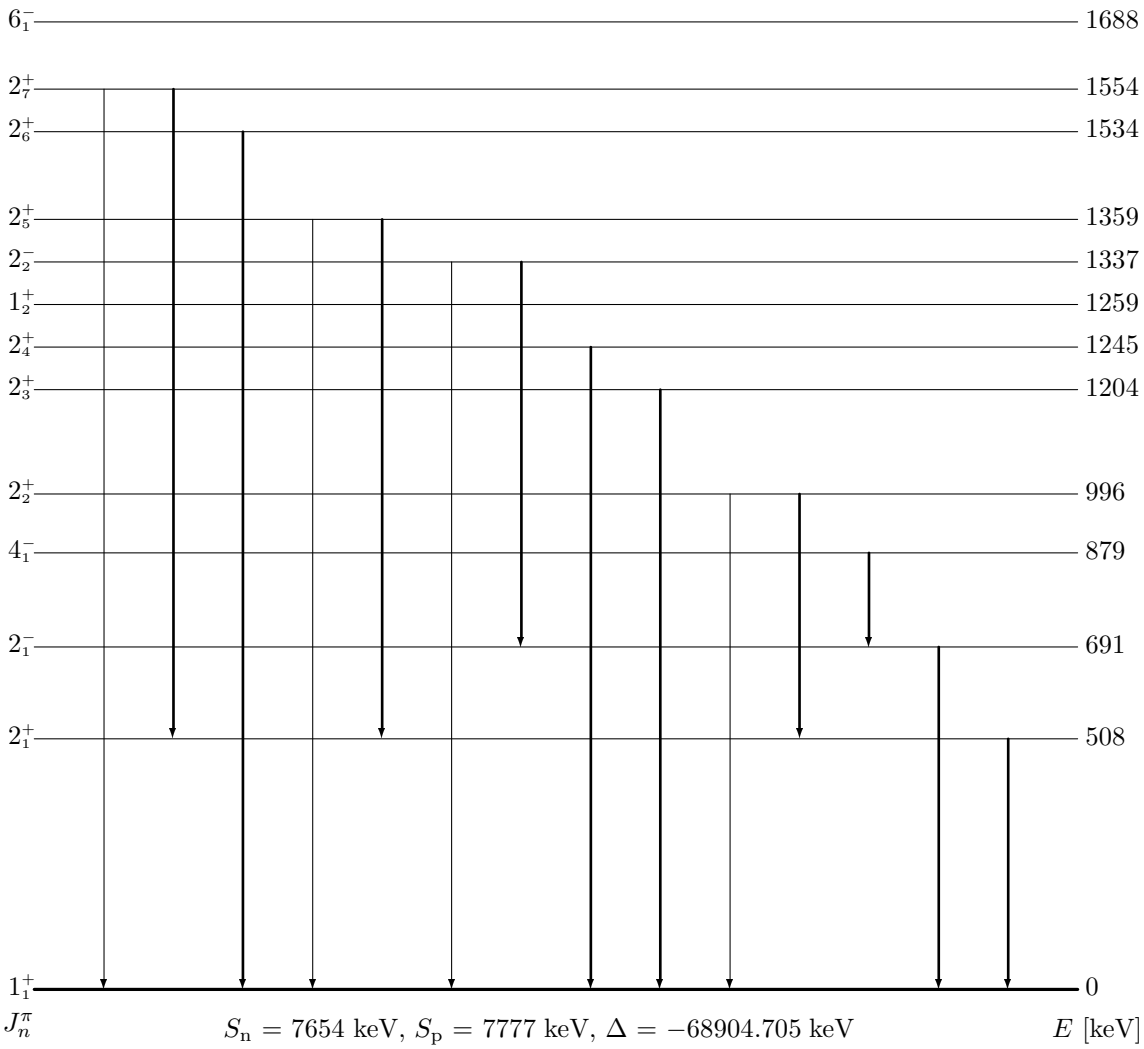


J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95B4, 98B]
1_1^+	0	67.629 m	log ft = 5.00 (β^+ from 0^+), Q = 0.0277 barn, μ = 0.01175 μ_n
2_1^+	175	≤5 ns	B(M1→ 1_1^+) > 0.00081 W.u., (p,n), (p,γ), (d,t), (d,α)
1_2^+	321		(p,n), (p,γ), (d,t), (d,α)
2_2^+	375		(p,n), (p,γ)
3_1^+	376	≤5 ns	B(M1/E2→ 2_1^+) > 0.00034/ > 0.53 W.u. (δ = 0.25), B(E2→ 1_1^+) > 0.25 W.u., (p,n), (p,γ), (d,t), (d,α)
4_1^+	496	≤5 ns	B(M1→ 3_1^+) > 0.0021 W.u., B(E2→ 2_1^+) > 0.075 W.u., (p,n), (p,γ), (d,t), (d,α)
1_3^+	514		(p,n), (p,γ), (d,t), (d,α)
2_1^-	584	≤5 ns	B(E1→ 1_1^+) > $4.0 \cdot 10^{-7}$ W.u., (p,n), (p,γ), (d,t), (d,α)
4_2^+	806	≤5 ns	B(M1→ 4_1^+) > $6.6 \cdot 10^{-5}$ W.u., B(M1→ 3_1^+) > $2.1 \cdot 10^{-5}$ W.u., (p,n), (p,γ), (d,t), (d,α)
4_1^-	877	≤5 ns	B(E2→ 2_1^-) > 1.6 W.u., B(E1→ 3_1^+) > $2.1 \cdot 10^{-7}$ W.u., (p,n), (p,γ), (d,t), (d,α)
2_2^-	1056	≤5 ns	B(M1→ 2_1^-) > $3.3 \cdot 10^{-5}$ W.u., (p,n), (p,γ)
5_1^-	1104	≤5 ns	B(E1→ 4_2^+) > $2.6 \cdot 10^{-7}$ W.u., B(E1→ 4_1^+) > $3.1 \cdot 10^{-7}$ W.u., (p,n), (p,γ), (d,α)
5_1^+	1223	≤5 ns	B(M1/E2→ 4_1^+) > $2.4 \cdot 10^{-6}$/ > 0.015 W.u. (δ = −1.4), (p,n), (d,α)
7_1^-	1230	62 ns	B(E2→ 5_1^-) = 7 W.u., Q = 0.72 barn, μ = 0.735 μ_n
5_2^-	1248	≤5 ns	B(M1/E2→ 4_1^-) > $6.4 \cdot 10^{-5}$/ > 0.019 W.u. (δ = −0.4), (d,t), (d,α)
6_1^-	1323	≤5 ns	B(M1→ 5_1^-) > 0.00035 W.u., (p,n), (d,t), (d,α)

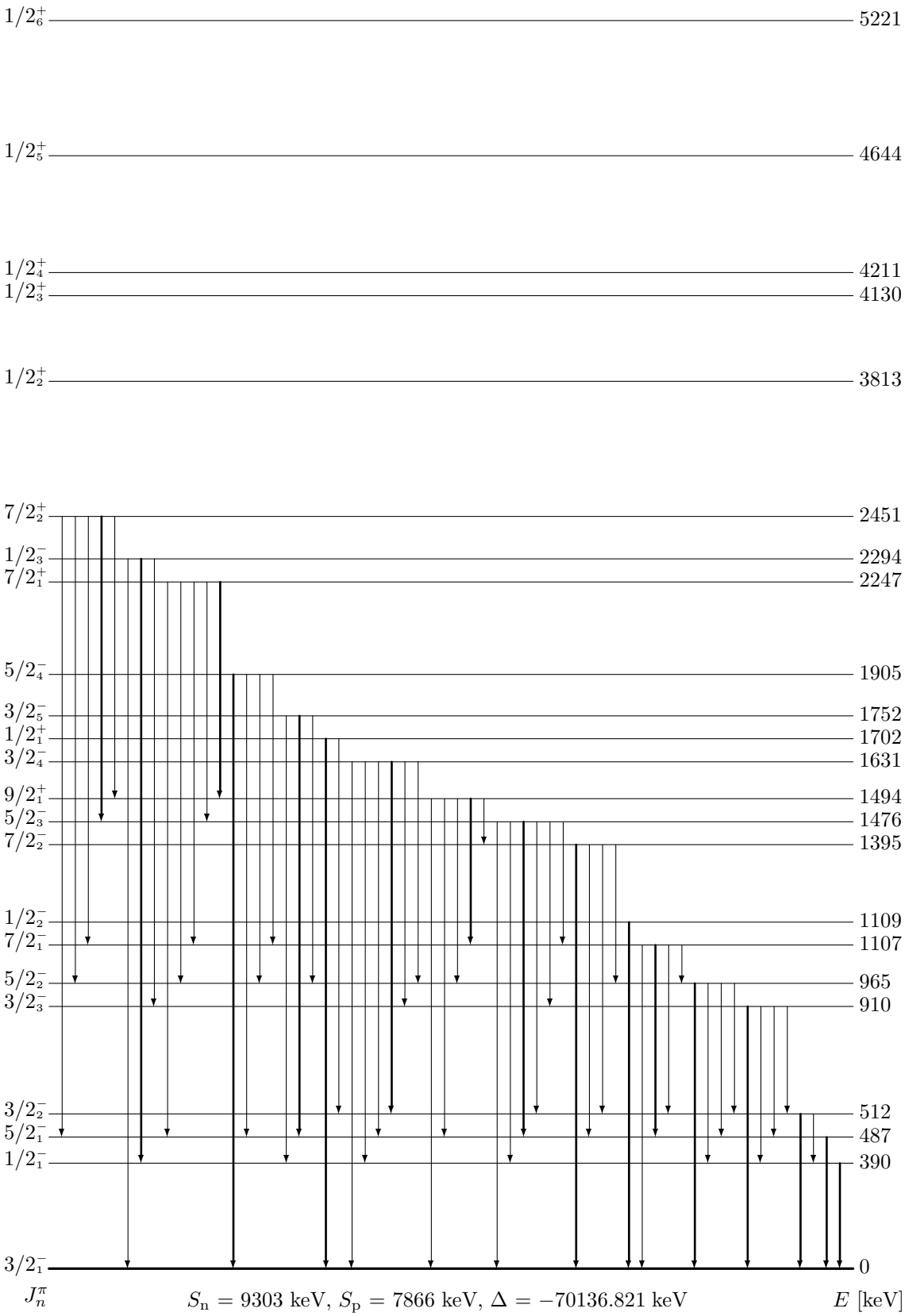


J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [89B, 98B]
$3/2_1^-$	0	stable	log ft = 4.48 (β^- from $1/2^-$), log ft = 6.49 (β^+ from $5/2^-$), Q = −0.168 barn, μ = 2.01659 μ_n
$1/2_1^-$	319	<70 ps	B(M1→ $3/2_1^-$) > 0.0071 W.u., log ft = 8.72 (β^- from $1/2^-$), (γ,γ'), Coul. ex., (p,γ), (d,n), (^{3}He,d), (d,^{3}He), (p,t)

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [89B, 98B]
$5/2_1^-$	574	1.7 ps	B(M1/E2→ $3/2_1^-$) = 0.07/1.1 W.u. ($\delta = -0.06$), log ft = 9.20 (β^- from $9/2^+$), log ft = 6.24 (β^+ from $5/2^-$), (γ,γ'), Coul. ex., (p,γ), (d,n), (^{3}He,d), (d,^{3}He), (p,t)
$3/2_2^-$	872	0.26 ps	B(M1/E2→ $3/2_1^-$) = 0.118/4.0 W.u. ($\delta = -0.13$), B(M1→ $1/2_1^-$) = 0.027 W.u., log ft = 5.43 (β^- from $1/2^-$), log ft = 6.00 (β^+ from $5/2^-$), (γ,γ'), Coul. ex., (p,γ), (d,n), (^{3}He,d), (d,^{3}He), (p,t)
$5/2_2^-$	1107	0.23 ps	B(M1/E2→ $3/2_2^-$) = 0.072/3. · 10^1 W.u. ($\delta = -0.12$), B(M1/E2→ $3/2_1^-$) = 0.062/8.0 W.u. ($\delta = 0.32$), B(M1/E2→ $5/2_1^-$) = 0.0023/12.5 W.u., log ft = 5.33 (β^+ from $5/2^-$), (γ,γ'), Coul. ex., (p,γ), (d,^{3}He), (p,t)
$7/2_1^-$	1337	1.1 ps	B(M1/E2→ $5/2_1^-$) = 0.00038/4.8 W.u. ($\delta = -2.2$), B(E2→ $3/2_1^-$) = 6.8 W.u., log ft = 6.05 (β^+ from $5/2^-$), (γ,γ'), Coul. ex., (p,γ), (d,n), (^{3}He,d), (d,^{3}He), (p,t)
$7/2_2^-$	1488	2.0 ps	B(M1/E2→ $5/2_1^-$) = 0.0006/7 W.u. ($\delta = -2.54$), B(M1→ $5/2_2^-$) = 0.026 W.u., B(E2→ $3/2_1^-$) = 1.1 W.u., log ft = 7.27 (β^+ from $5/2^-$), (γ,γ'), (p,γ), (d,n), (d,^{3}He), (p,t)
$3/2_3^-$	1526	≥0.55 ps	B(M1/E2→ $5/2_2^-$) < 0.052/ < 4.3 W.u. ($\delta = 0.05$), B(M1/E2→ $5/2_1^-$) < 0.0019/ < 0.69 W.u. ($\delta = 0.3$), B(M1/E2→ $1/2_1^-$) < 0.012/ < 0.30 W.u. ($\delta = 0.14$), B(M1/E2→ $3/2_1^-$) < 0.0036/ < 0.43 W.u. ($\delta = -0.38$), log ft = 6.60 (β^+ from $5/2^-$), (γ,γ'), (p,γ), (^{3}He,d), (p,t)
$5/2_3^-$	1724	0.15 ps	B(M1→ $5/2_2^-$) = 0.06 W.u., B(E2→ $1/2_1^-$) = 6 W.u., B(M1/E2→ $5/2_1^-$) = 0.023/6 W.u. ($\delta = -0.46$), B(M1/E2→ $3/2_1^-$) = 0.008/2.3 W.u. ($\delta = -0.75$), log ft = 7.43 (β^+ from $5/2^-$), (γ,γ'), (p,γ), (d,n), (^{3}He,d), (p,t)
$9/2_1^-$	1765	0.83 ps	B(E2→ $5/2_1^-$) = 17 W.u., (p,γ), (p,t)
$3/2_4^-$	1892	21 fs	B(M1/E2→ $3/2_1^-$) = 0.102/1.0 W.u. ($\delta = -0.15$), B(M1→ $1/2_1^-$) = 0.086 W.u., log ft = 5.98 (β^+ from $5/2^-$), (γ,γ'), (p,γ), (^{3}He,d), (d,^{3}He), (p,t)
$7/2_3^-$	1924	≥0.62 ps	B(M1/E2→ $5/2_1^-$) < 0.00062/ < 2.9 W.u. ($\delta = -2.6$), B(M1→ $7/2_1^-$) < 0.042 W.u., B(E2→ $3/2_2^-$) < 15 W.u., log ft = 5.65 (β^+ from $5/2^-$), (γ,γ'), (p,γ), (d,^{3}He), (p,t)
$5/2_4^-$	2024	0.17 ps	B(M1/E2→ $3/2_1^-$) = 0.0131/0.12 W.u. ($\delta = 0.16$), log ft = 5.57 (β^+ from $5/2^-$), (γ,γ'), (p,γ), (^{3}He,d), (p,t)
$5/2_5^-$	2045	111 fs	B(M1/E2→ $3/2_2^-$) = 0.037/2.2 W.u. ($\delta = -0.23$), B(M1/E2→ $3/2_1^-$) = 0.0076/0.19 W.u. ($\delta = 0.26$), B(M1→ $5/2_1^-$) = 0.020 W.u., log ft = 6.60 (β^+ from $5/2^-$), (γ,γ'), (p,γ), (^{3}He,d), (p,t)
$3/2_5^-$	2660		(γ,γ'), (d,n), (^{3}He,d), (p,t)
$5/2_1^+$	3077		(γ,γ'), (d,n), (^{3}He,d)
$11/2_1^-$	3118	0.24 ps	(p,t)
$13/2_1^-$	3242	0.49 ps	B(E2→ $9/2_1^-$) = 9.8 W.u., (p,t)
$3/2_6^-$	3283		(γ,γ'), (p,t)
$7/2_4^-$	3319		(γ,γ'), (^{3}He,d), (p,t)
$3/2_7^-$	3371		(p,t)
$3/2_8^-$	3757		(^{3}He,d), (p,t)
$3/2_9^-$	4251		(^{3}He,d), (p,t)
$1/2_1^+$	4830		(^{3}He,d)

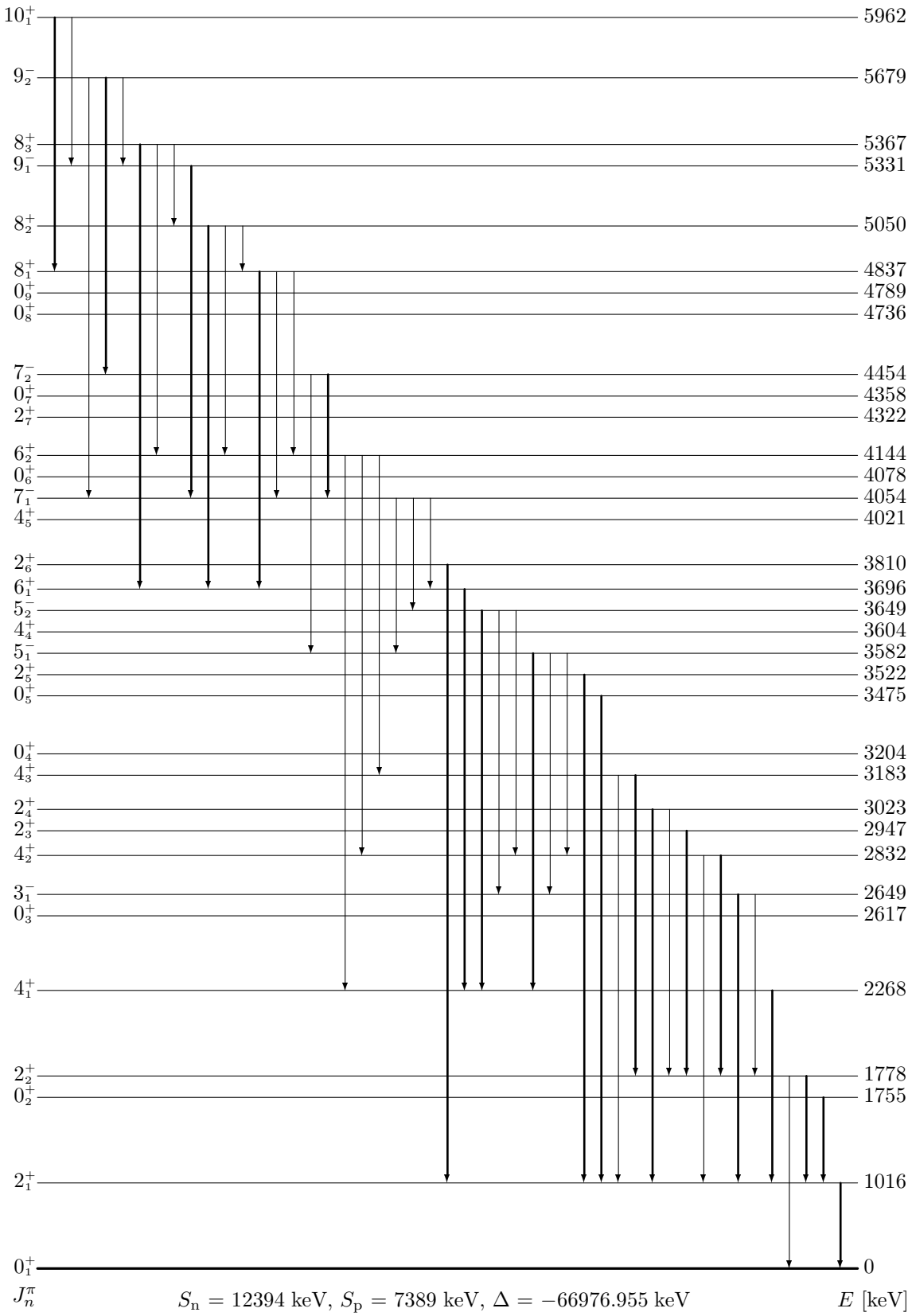


J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93B2, 98B]
1_1^+	0	21.14 m	(p,n), (d,t), (d,p)
2_1^+	508	<4 ns	B(M1→ 1_1^+) > $4.2 \cdot 10^{-5}$ W.u., (p,n), (d,t), (d,p)
2_1^-	691	<4 ns	B(E1→ 1_1^+) > $3.0 \cdot 10^{-7}$ W.u., (p,n), (d,p)
4_1^-	879	22.7 ns	B(E2→ 2_1^-) = 5.79 W.u., (p,n), (d,t), (d,p), $\mu = -0.26\ \mu_n$
2_2^+	996		(p,n), (d,t), (d,p)
2_3^+	1204	>0.2 ps	(p,n), (d,t), (d,p)
2_4^+	1245	>0.5 ps	B(M1/E2→ 1_1^+) < 0.023/ < 0.14 W.u. ($\delta = -0.05$), (p,n), (d,p)
1_2^+	1259		(p,n), (d,t), (d,p)
2_2^-	1337		(p,n), (d,p)
2_5^+	1359		(p,n), (d,t), (d,p)
2_6^+	1534		(p,n), (d,t), (d,p)
2_7^+	1554		(p,n), (d,t), (d,p)
6_1^-	1688	<4 ns	(d,p)

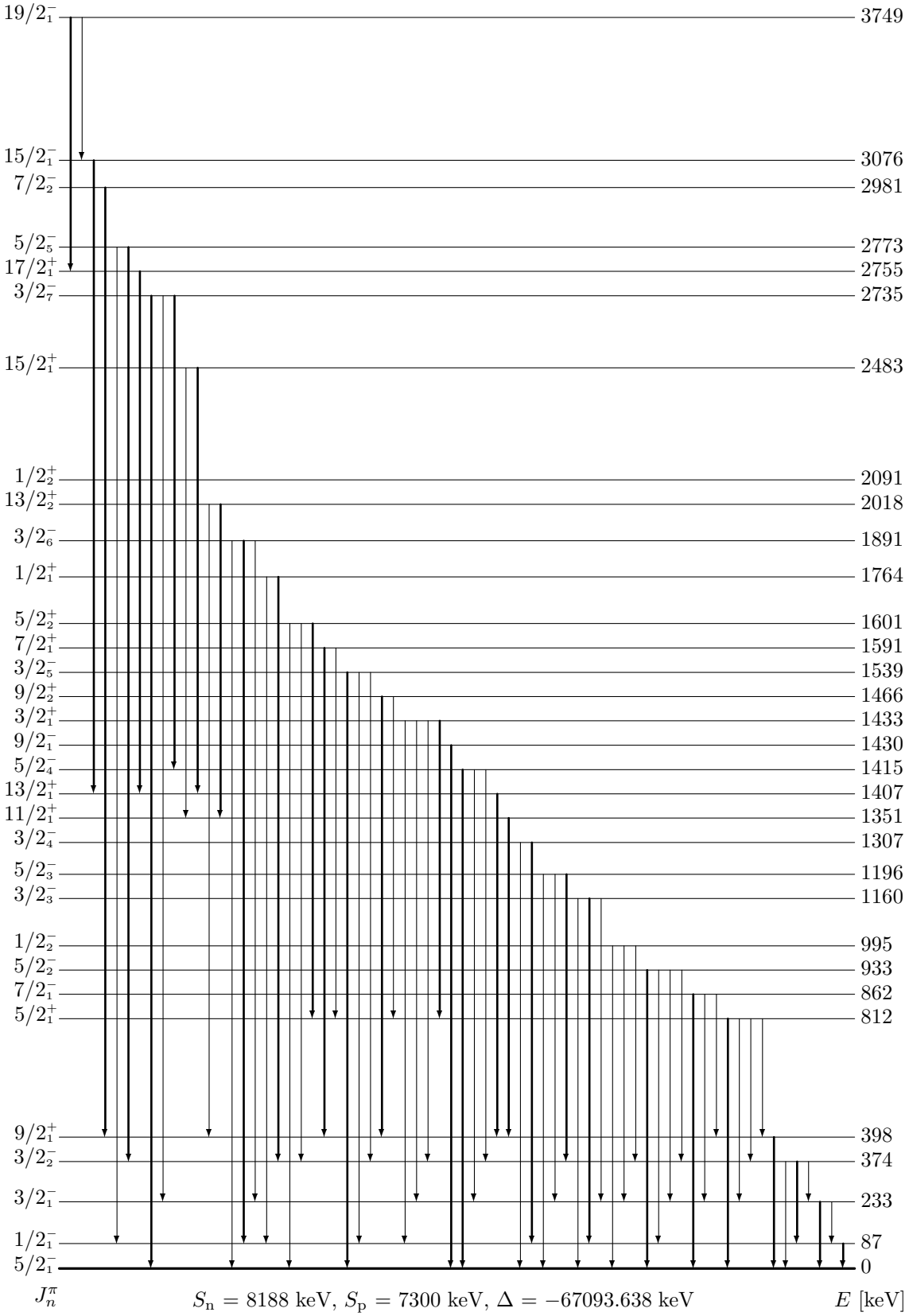


J^π_n $S_\mathrm{n} = 9303$ keV, $S_\mathrm{p} = 7866$ keV, $\Delta = -70136.821$ keV E [keV]

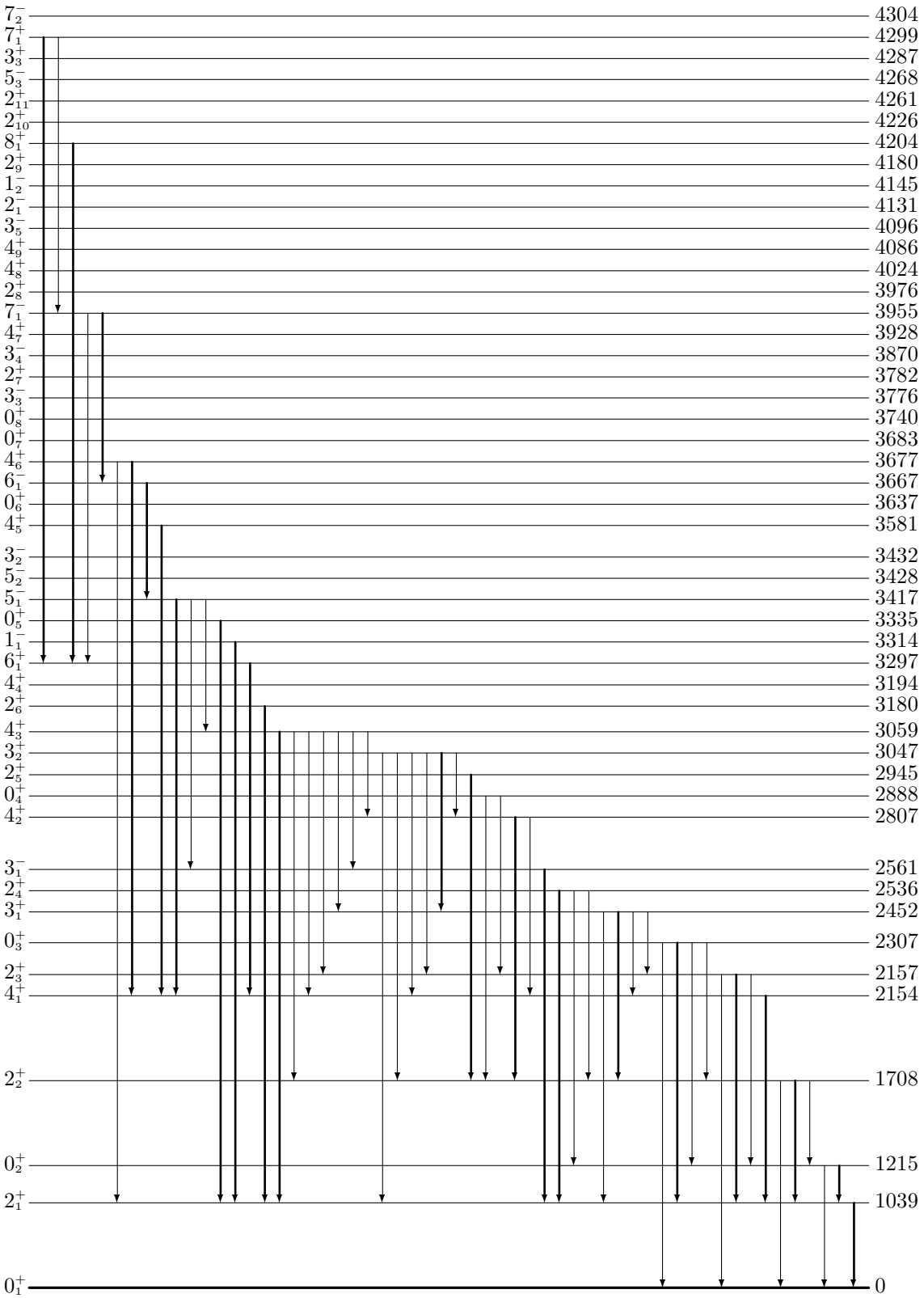
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93B3, 98B]
$3/2_1^-$	0	stable	$Q = 0.106$ barn, $\mu = 2.562266\ \mu_n$
$1/2_1^-$	390	>2.8 ps	log $ft = 7.20$ (β^- from $1/2^-$), (γ,γ'), Coul. ex., (d,^{3}He), (^{3}He,d)
$5/2_1^-$	487	>23 ps	B(M1/E2$\rightarrow 3/2_1^-$) < 0.0083/ < 0.061 W.u. ($\delta = -0.024$), (γ,γ'), Coul. ex., (d,^{3}He), (^{3}He,d)
$3/2_2^-$	512	1.5 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.09/7. $\cdot 10^1$ W.u. ($\delta = -0.37$), (γ,γ'), Coul. ex., (d,^{3}He), (^{3}He,d), (t,p)
$3/2_3^-$	910	0.24 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.11/1.3 W.u. ($\delta = 0.08$), log ft = 5.50 (β^- from $1/2^-$), (γ,γ'), Coul. ex., (d,^{3}He), (^{3}He,d), (t,p)
$5/2_2^-$	965	1.4 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.0049/13 W.u. ($\delta = 1.3$), log ft = 7.40 (β^- from $1/2^-$), (γ,γ'), Coul. ex., (d,^{3}He), (^{3}He,d), (t,p)
$7/2_1^-$	1107	0.52 ps	B(M1/E2$\rightarrow 5/2_1^-$) = 0.072/1.4 $\cdot 10^2$ W.u. ($\delta = 0.72$), B(M1$\rightarrow 5/2_2^-$) = 0.88 W.u., (γ,γ'), Coul. ex.
$1/2_2^-$	1109	0.095 ps	log ft = 7.00 (β^- from $1/2^-$), (γ,γ'), Coul. ex., (d,^{3}He), (^{3}He,d), (t,p)
$7/2_2^-$	1395	0.76 ps	B(E2$\rightarrow 3/2_1^-$) = 4.6 W.u., log ft = 9.90 (β^- from $9/2^+$), (γ,γ'), Coul. ex., (d,^{3}He), (^{3}He,d), (t,p)
$5/2_3^-$	1476	>0.48 ps	B(M1/E2$\rightarrow 5/2_1^-$) < 0.022/ < 1.7 W.u. ($\delta = 0.20$), (γ,γ'), Coul. ex., (d,^{3}He)
$9/2_1^+$	1494	154 ps	B(E1$\rightarrow 7/2_2^-$) = 1.8 $\cdot 10^{-6}$ W.u., B(E1$\rightarrow 7/2_1^-$) = 4.4 $\cdot 10^{-5}$ W.u., (γ,γ'), (d,^{3}He), (^{3}He,d), (t,p)
$3/2_4^-$	1631	0.15 ps	log $ft = 5.00$ (β^- from $1/2^-$), (γ,γ'), (d,^{3}He), (^{3}He,d), (t,p)
$1/2_1^+$	1702		(γ,γ'), (^{3}He,d)
$3/2_5^-$	1752	0.26 ps	
$5/2_4^-$	1905	0.24 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.0036/0.9 W.u. ($\delta = 0.8$), (d,^{3}He), (t,p)
$7/2_1^+$	2247	0.021 ps	B(M1/E2$\rightarrow 9/2_1^+$) = 1.2/22 W.u. ($\delta = -0.085$), log ft = 5.93 (β^- from $9/2^+$), (^{3}He,d), (t,p)
$1/2_3^-$	2294		log ft = 4.90 (β^- from $1/2^-$), (^{3}He,d), (t,p)
$7/2_2^+$	2451		log ft = 6.43 (β^- from $9/2^+$), (t,p)
$1/2_2^+$	3813		(^{3}He,d)
$1/2_3^+$	4130		(^{3}He,d)
$1/2_4^+$	4211		(^{3}He,d)
$1/2_5^+$	4644		(^{3}He,d)
$1/2_6^+$	5221		(^{3}He,d)


10_1^+ 5962
9_2^- 5679
8_3^+ 5367
9_1^- 5331
8_2^+ 5050
8_1^+ 4837
0_9^+ 4789
0_8^+ 4736
7_2^- 4454
0_7^+ 4358
2_7^+ 4322
6_2^+ 4144
0_6^+ 4078
7_1^- 4054
4_5^+ 4021
2_6^+ 3810
6_1^+ 3696
5_2^- 3649
4_4^+ 3604
5_1^- 3582
2_5^+ 3522
0_5^+ 3475
0_4^+ 3204
4_3^+ 3183
2_4^+ 3023
2_3^+ 2947
4_2^+ 2832
3_1^- 2649
0_3^+ 2617
4_1^+ 2268
2_2^+ 1778
0_2^+ 1755
2_1^+ 1016
0_1^+ 0
J_n^π
$S_\mathrm{n} = 12394$ keV, $S_\mathrm{p} = 7389$ keV, $\Delta = -66976.955$ keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95B4, 98B]
0_1^+	0	270.8 d	(p,t)
2_1^+	1016	1.8 ps	$B(\text{E2}\rightarrow 0_1^+) = 17.6$ W.u., log $ft = 7.33$ (β^+ from $(3,4)$), (p,t)
0_2^+	1755		(p,t)
2_2^+	1778	4.2 ps	$B(\text{M1/E2}\rightarrow 2_1^+) = 0.0071/0.43$ W.u. ($\delta = -0.15$), $B(\text{E2}\rightarrow 0_1^+) = 0.18$ W.u., log $ft = 6.87$ (β^+ from $(3,4)$), (p,t)
4_1^+	2268	0.8 ps	$B(\text{E2}\rightarrow 2_1^+) = 13.9$ W.u., log $ft = 6.87$ (β^+ from $(3,4)$), (p,t)
0_3^+	2617		(p,t)
3_1^-	2649	1.7 ps	$B(\text{E1/M2}\rightarrow 2_1^+) = 5.\cdot 10^{-5}/0.7$ W.u. ($\delta = 0.09$), log $ft = 7.42$ (β^+ from $(3,4)$), (p,t)
4_2^+	2832	0.8 ps	$B(\text{E2}\rightarrow 2_2^+) = 24$ W.u., $B(\text{E2}\rightarrow 2_1^+) = 0.5$ W.u., log $ft = 6.77$ (β^+ from $(3,4)$), (p,t)
2_3^+	2947		log $ft = 7.24$ (β^+ from $(3,4)$), (p,t)
2_4^+	3023		log $ft = 6.57$ (β^+ from $(3,4)$), (p,t)
4_3^+	3183		(p,t)
0_4^+	3204		(p,t)
0_5^+	3475		log $ft = 6.24$ (β^+ from $(3,4)$), (p,t)
2_5^+	3522		log $ft = 6.78$ (β^+ from $(3,4)$), (p,t)
5_1^-	3582	1.2 ps	$B(\text{E2}\rightarrow 3_1^-) = 6.6$ W.u., $B(\text{E1/M2}\rightarrow 4_1^+) = 0.00011/0.8$ W.u. ($\delta = 0.05$), (p,t)
4_4^+	3604		(p,t)
5_2^-	3649	1.4 ps	$B(\text{E2}\rightarrow 3_1^-) = 2.9$ W.u., $B(\text{E1/M2}\rightarrow 4_1^+) = 9.\cdot 10^{-5}/ < 0.11$ W.u. ($\delta = -0.01$), (p,t)
6_1^+	3696	0.48 ps	$B(\text{E2}\rightarrow 4_1^+) = 12$ W.u., $\mu = 2.4\ \mu_n$
2_6^+	3810		log $ft = 6.66$ (β^+ from $(3,4)$), (p,t)
4_5^+	4021		(p,t)
7_1^-	4054	118 ps	$B(\text{E1}\rightarrow 6_1^+) = 7.3\cdot 10^{-6}$ W.u., $B(\text{E2}\rightarrow 5_2^-) = 4.1$ W.u., $B(\text{E2}\rightarrow 5_1^-) = 3.2$ W.u., $\mu = 0.78\ \mu_n$, (p,t)
0_6^+	4078		(p,t)
6_2^+	4144		(p,t)
2_7^+	4322		(p,t)
0_7^+	4358		(p,t)
7_2^-	4454	0.97 ps	$B(\text{M1/E2}\rightarrow 7_1^-) = 0.18/4.\cdot 10^2$ W.u. ($\delta = 0.5$), (p,t)
0_8^+	4736		(p,t)
0_9^+	4789		(p,t)
8_1^+	4837	1.04 ps	$B(\text{E2}\rightarrow 6_1^+) = 15$ W.u., $\mu = 0.80\ \mu_n$
8_2^+	5050	0.49 ps	$B(\text{E2}\rightarrow 6_1^+) = 15$ W.u., $\mu = -2.2\ \mu_n$
9_1^-	5331	0.69 ps	$B(\text{E2}\rightarrow 7_1^-) = 15$ W.u.
8_3^+	5367	0.8 ps	$B(\text{E2}\rightarrow 6_1^+) = 3.3$ W.u.
9_2^-	5679	0.5 ps	$B(\text{E2}\rightarrow 7_2^-) = 25$ W.u.
10_1^+	5962	0.76 ps	$B(\text{E2}\rightarrow 8_1^+) = 24$ W.u.

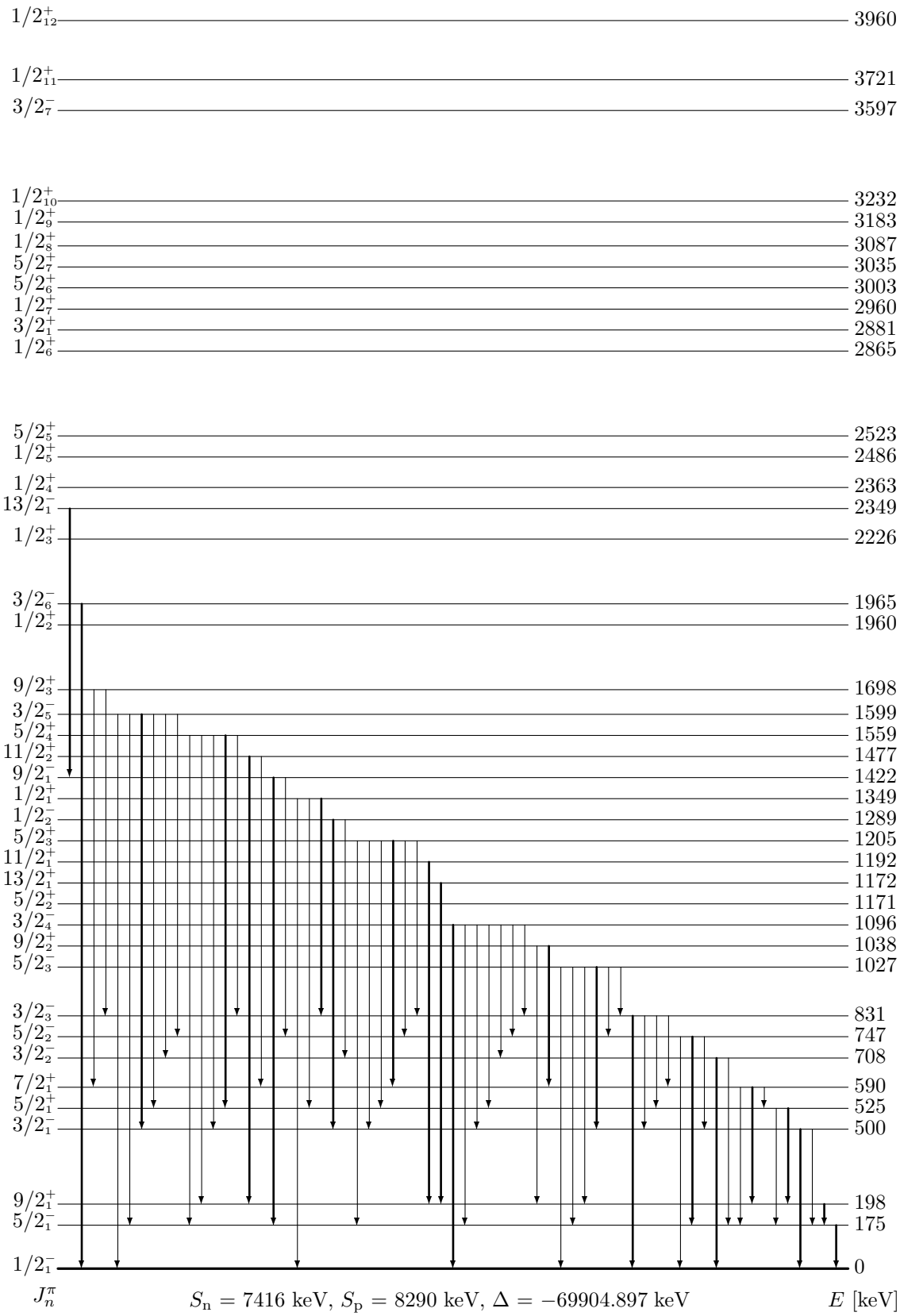

19/2$_1^-$ 3749
15/2$_1^-$ 3076
7/2$_2^-$ 2981
5/2$_5^-$ 2773
17/2$_1^+$ 2755
3/2$_7^-$ 2735
15/2$_1^+$ 2483
1/2$_2^+$ 2091
13/2$_2^+$ 2018
3/2$_6^-$ 1891
1/2$_1^+$ 1764
5/2$_2^+$ 1601
7/2$_1^+$ 1591
3/2$_5^-$ 1539
9/2$_2^+$ 1466
3/2$_1^+$ 1433
9/2$_1^-$ 1430
5/2$_4^-$ 1415
13/2$_1^+$ 1407
11/2$_1^+$ 1351
3/2$_4^-$ 1307
5/2$_3^-$ 1196
3/2$_3^-$ 1160
1/2$_2^-$ 995
5/2$_2^-$ 933
7/2$_1^-$ 862
5/2$_1^+$ 812
9/2$_1^+$ 398
3/2$_2^-$ 374
3/2$_1^-$ 233
1/2$_1^-$ 87
5/2$_1^-$ 0
J_n^π
S_n = 8188 keV, S_p = 7300 keV, Δ = −67093.638 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [89B, 98B]
$5/2_1^-$	0	39.05 h	log $ft = 5.49$ (β^+ from $5/2^-$), $Q = 0.024$ barn, $\mu = 0.735\ \mu_n$
$1/2_1^-$	87	5.1 μs	B(E2$\rightarrow 5/2_1^-$) = 0.584 W.u., (p,d), (d,t), (^{3}He,α), (^{3}He,t)
$3/2_1^-$	233	176 ps	B(M1/E2$\rightarrow 1/2_1^-$) = 0.0119/30 W.u. ($\delta = 0.19$), B(M1/E2$\rightarrow 5/2_1^-$) = 0.0043/67 W.u. ($\delta = 0.74$), log $ft = 6.05$ (β^+ from $5/2^-$), (p,d), (d,t), (^{3}He,α), (^{3}He,t)
$3/2_2^-$	374		log $ft = 7.21$ (β^+ from $5/2^-$), (p,d), (d,t), (^{3}He,α), (^{3}He,t)
$9/2_1^+$	398	2.81 μs	B(M2$\rightarrow 5/2_1^-$) = 0.0619 W.u., log $ft = 8.51$ (β^+ from $5/2^-$), $\mu = -1.0011\ \mu_n$, (p,d), (d,t)
$5/2_1^+$	812		log $ft = 6.75$ (β^+ from $5/2^-$), (p,d), (d,t)
$7/2_1^-$	862	2.1 ps	B(M1/E2$\rightarrow 5/2_1^-$) = 0.0022/26 W.u. ($\delta = 2.4$), B(E2$\rightarrow 3/2_1^-$) = 12 W.u., log $ft = 6.98$ (β^+ from $5/2^-$)
$5/2_2^-$	933	1.5 ps	B(E2$\rightarrow 1/2_1^-$) = 8 W.u., log $ft = 6.94$ (β^+ from $5/2^-$)
$1/2_2^-$	995	0.62 ps	B(M1$\rightarrow 3/2_2^-$) = 0.07 W.u., B(M1$\rightarrow 3/2_1^-$) = 0.027 W.u., (p,d), (d,t), (^{3}He,α), (^{3}He,t)
$3/2_3^-$	1160	1.2 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.0027/1.7 W.u. ($\delta = -0.6$), B(M1/E2$\rightarrow 1/2_1^-$) = 0.009/1.2 W.u. ($\delta = 0.31$), B(M1$\rightarrow 5/2_1^-$) = 0.0016 W.u., log $ft = 6.79$ (β^+ from $5/2^-$), (p,d), (d,t)
$5/2_3^-$	1196	0.97 ps	log $ft = 6.65$ (β^+ from $5/2^-$)
$3/2_4^-$	1307	0.50 ps	B(M1/E2$\rightarrow 1/2_1^-$) = 0.012/1.1 W.u. ($\delta = 0.3$), B(M1$\rightarrow 5/2_1^-$) = 0.009 W.u., log $ft = 6.71$ (β^+ from $5/2^-$), (p,d), (d,t)
$11/2_1^+$	1351	0.56 ps	B(M1/E2$\rightarrow 9/2_1^+$) = 0.030/27 W.u. ($\delta = 0.73$)
$13/2_1^+$	1407	1.3 ps	B(E2$\rightarrow 9/2_1^+$) = 25 W.u., (p,d)
$5/2_4^-$	1415	0.97 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.0015/0.40 W.u. ($\delta = 0.49$), B(M1/E2$\rightarrow 5/2_1^-$) = 0.0035/1.1 W.u. ($\delta = -0.65$), log $ft = 6.80$ (β^+ from $5/2^-$), (p,d), (d,t)
$9/2_1^-$	1430	0.53 ps	B(E2$\rightarrow 5/2_1^-$) = 10.6 W.u.
$3/2_1^+$	1433	1.4 ps	
$9/2_2^+$	1466	2.1 ps	B(E2$\rightarrow 5/2_1^+$) = 8 W.u., B(M1/E2$\rightarrow 9/2_1^+$) = 0.0025/6 W.u. ($\delta = -1.40$), (p,d), (d,t)
$3/2_5^-$	1539	0.35 ps	B(M1$\rightarrow 1/2_1^-$) = 0.0041 W.u., log $ft = 7.02$ (β^+ from $5/2^-$), (p,d), (d,t)
$7/2_1^+$	1591	0.66 ps	
$5/2_2^+$	1601	0.52 ps	
$1/2_1^+$	1764		(p,d), (d,t)
$3/2_6^-$	1891		log $ft = 6.21$ (β^+ from $5/2^-$), (p,d)
$13/2_2^+$	2018	1.8 ps	B(M1/E2$\rightarrow 11/2_1^+$) = 0.025/20 W.u. ($\delta = 0.48$), (p,d)
$1/2_2^+$	2091		(p,d), (d,t)
$15/2_1^+$	2483	1.2 ps	B(M1/E2$\rightarrow 13/2_1^+$) = 0.006/1.6 W.u. ($\delta = 0.44$), B(E2$\rightarrow 11/2_1^+$) = 7 W.u., (p,d)
$3/2_7^-$	2735		log $ft = 5.73$ (β^+ from $5/2^-$), (p,d)
$17/2_1^+$	2755	0.6 ps	B(E2$\rightarrow 13/2_1^+$) = 12.6 W.u.
$5/2_5^-$	2773		log $ft = 5.57$ (β^+ from $5/2^-$), (p,d)
$7/2_2^-$	2981		log $ft = 5.44$ (β^+ from $5/2^-$), (p,d)
$15/2_1^-$	3076	1.5 ps	B(E1$\rightarrow 13/2_1^+$) = $6. \cdot 10^{-5}$ W.u.
$19/2_1^-$	3749	6.5 ps	B(E2$\rightarrow 15/2_1^-$) = 8.5 W.u., B(E1$\rightarrow 17/2_1^+$) = $3.7 \cdot 10^{-5}$ W.u.


7^-_2 4304
7^+_1 4299
3^+_3 4287
5^-_3 4268
2^+_{11} 4261
2^+_{10} 4226
8^+_1 4204
2^+_9 4180
1^-_2 4145
2^-_1 4131
3^-_5 4096
4^+_9 4086
4^+_8 4024
2^+_8 3976
7^-_1 3955
4^+_7 3928
3^-_4 3870
2^+_7 3782
3^-_3 3776
0^+_8 3740
0^+_7 3683
4^+_6 3677
6^-_1 3667
0^+_6 3637
4^+_5 3581
3^-_2 3432
5^-_2 3428
5^-_1 3417
0^+_5 3335
1^-_1 3314
6^+_1 3297
4^+_4 3194
2^+_6 3180
4^+_3 3059
3^+_2 3047
2^+_5 2945
0^+_4 2888
4^+_2 2807
3^-_1 2561
2^+_4 2536
3^+_1 2452
0^+_3 2307
2^+_3 2157
4^+_1 2154
2^+_2 1708
0^+_2 1215
2^+_1 1039
0^+_1 0
J^π_n
S_n = 11536 keV, S_p = 8528 keV, Δ = −70560.320 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93B2, 98B]
0_1^+	0	stable	log ft = 5.10 (β^- from 1^+), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (d,n), (^{3}He,d), (p,t), (α,t)
2_1^+	1039	1.30 ps	B(E2→ 0_1^+) = 21.0 W.u., log ft = 5.90 (β^- from 1^+), Q = 0.03 barn, μ = 0.936 μ_n, Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (^{3}He,d), (p,t), (α,t)
0_2^+	1215	3.7 ns	B(E2→ 2_1^+) = 48 W.u., log ft = 5.40 (β^- from 1^+), Coul. ex., (p,p′), (d,d′), (α,α'), (d,n), (^{3}He,d), (p,t), (α,t)
2_2^+	1708	1.1 ps	B(E2→ 0_2^+) = 25 W.u., B(E2→ 0_1^+) = 1.0 W.u., B(M1/E2→ 2_1^+) = 0.0025/1.11 · 10^2 W.u. (δ = −3.6), Coul. ex., (p,p′), (d,d′), (α,α'), (^{3}He,d), (p,t), (α,t)
4_1^+	2154	0.8 ps	B(E2→ 2_1^+) = 24 W.u., log ft = 7.30 (β^+ from $4^{(+)}$), Coul. ex., (p,p′), (d,d′), (α,α'), (p,t), (α,t)
2_3^+	2157		(p,p′), (α,α'), (^{3}He,d)
0_3^+	2307	≤40 ps	B(E2→ 2_2^+) > 4.8 W.u., B(E2→ 2_1^+) > 0.14 W.u., (p,p′), (^{3}He,d), (p,t), (α,t)
3_1^+	2452	1.7 ps	B(M1→ 2_2^+) = W.u., log ft = 6.80 (β^+ from $4^{(+)}$), (p,p′), (^{3}He,d), (α,t)
2_4^+	2536	0.6 ps	log ft = 7.60 (β^+ from $4^{(+)}$), (p,p′), (^{3}He,d), (p,t), (α,t)
3_1^-	2561	0.4 ps	B(E1/M2→ 2_1^+) = 0.00028/ < 20 W.u. (δ = −0.11), Coul. ex., (e,e′), (p,p′), (d,d′), (α,α'), (^{3}He,d), (p,t), (α,t)
4_2^+	2807	0.6 ps	B(E2→ 2_2^+) = W.u., log ft = 7.20 (β^+ from $4^{(+)}$), (p,p′), (α,α'), (^{3}He,d), (p,t), (α,t)
0_4^+	2888		(p,p′), (^{3}He,d), (p,t), (α,t)
2_5^+	2945		(p,p′), (α,α'), (^{3}He,d), (p,t), (α,t)
3_2^+	3047		log ft = 5.80 (β^+ from $4^{(+)}$), (p,p′)
4_3^+	3059	0.20 ps	B(E2→ 2_1^+) = 2.0 W.u., log ft = 5.70 (β^+ from $4^{(+)}$), (p,p′), (α,α'), (^{3}He,d), (p,t), (α,t)
2_6^+	3180	0.015 ps	(p,p′), (α,α'), (^{3}He,d), (p,t)
4_4^+	3194		(p,p′), (α,α'), (p,t), (α,t)
6_1^+	3297	0.5 ps	B(E2→ 4_1^+) = 34 W.u.
1_1^-	3314		(p,p′), (α,α'), (^{3}He,d), (p,t)
0_5^+	3335		(p,p′), (^{3}He,d), (p,t), (α,t)
5_1^-	3417	13.7 ps	B(E1/M2→ 4_3^+) = 0.00013/17 W.u. (δ = −0.06), B(E1/M2→ 4_1^+) = 6. · 10^{-6}/ < 0.13 W.u. (δ = −0.05), B(E2→ 3_1^-) = 2.0 W.u., (p,p′), (p,t)
5_2^-	3428		(p,p′), (α,α')
3_2^-	3432		(p,p′), (α,α')
4_5^+	3581	0.6 ps	(p,p′), (α,α')
0_6^+	3637		(α,α')
6_1^-	3667	35 ps	B(M1→ 5_1^-) = 0.040 W.u., (p,p′), (^{3}He,d)
4_6^+	3677		log ft = 6.00 (β^+ from $4^{(+)}$), (p,p′), (α,α'), (α,t)
0_7^+	3683		(p,t)
0_8^+	3740		(p,p′), (p,t)
3_3^-	3776		(p,p′), (α,α'), (^{3}He,d)
2_7^+	3782		(p,p′), (p,t)
3_4^-	3870		(p,p′), (α,α'), (p,t)
4_7^+	3928		(p,p′), (p,t)
7_1^-	3955	17.0 ps	B(M1→ 6_1^-) = 0.045 W.u., B(E1→ 6_1^+) = 1.3 · 10^{-5} W.u., (α,α')
2_8^+	3976		(p,p′), (α,α')
4_8^+	4024		(^{3}He,d), (p,t)

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93B2, 98B]
4_9^+	4086		(p,t)
3_5^-	4096		(p,p′), (α,α')
2_1^-	4131		(p,p′), (^{3}He,d)
1_2^-	4145		(p,p′), (α,α')
2_9^+	4180		(p,p′), (p,t)
8_1^+	4204	8 ps	B(E2→ 6_1^+) = W.u., (p,p′)
2_{10}^+	4226		(p,p′), (p,t)
2_{11}^+	4261		(p,p′), (p,t)
5_3^-	4268		(α,α')
3_3^+	4287		(p,p′), (^{3}He,d)
7_1^+	4299	3 ps	B(E1→ 7_1^-) = 0.0015 W.u., B(M1/E2→ 6_1^+) = 0.004/0.08 W.u. (δ = 0.11), (p,p′)
7_2^-	4304		(α,α')
4_{10}^+	4409		(p,p′), (α,α')
2_{12}^+	4448		(p,p′), (α,α'), (^{3}He,d), (p,t)
4_{11}^+	4473		(p,p′), (α,α'), (^{3}He,d), (p,t)
0_9^+	4539		(p,t)
3_6^-	4810		(α,α')
2_2^-	4877		(^{3}He,d)
3_7^-	4905		(α,α'), (^{3}He,d)
1_3^-	4935		(p,t)
3_8^-	4940		(α,α')
2_3^-	5008		(α,α'), (^{3}He,d)
2_{13}^+	5024		(p,t)
2_4^-	5049		(^{3}He,d), (α,t)
0_{10}^+	5050		(p,t)
0_{11}^+	5184		(p,t)
0_{12}^+	5290		(p,t)
0_{13}^+	5338		(p,t)
0_{14}^+	5403		(p,t)
0_{15}^+	5467		(p,t)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3/2−7 3597
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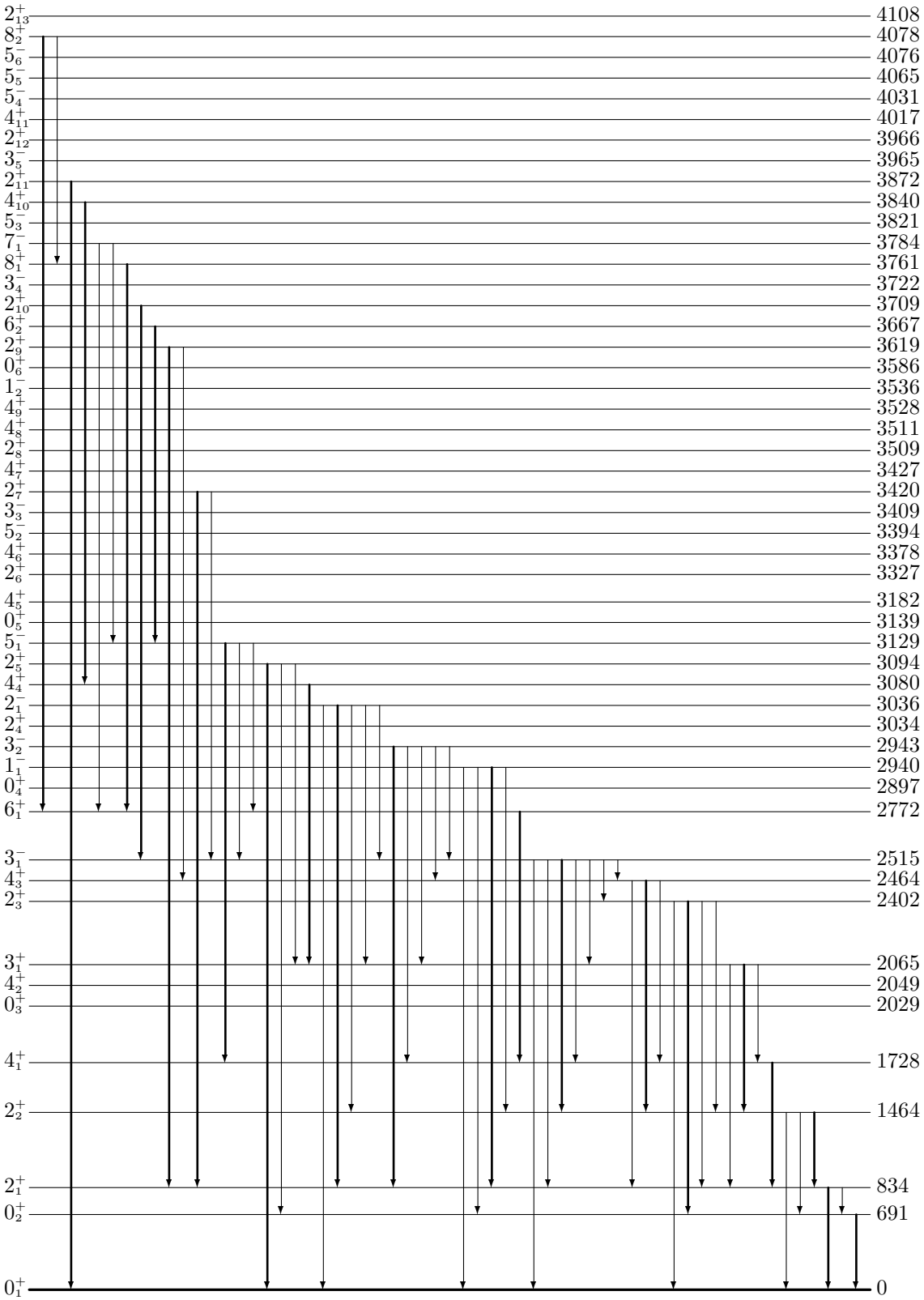
1/2+8 3087
5/2+7 3035
5/2+6 3003
1/2+7 2960
3/2+1 2881
1/2+6 2865
5/2+5 2523
1/2+5 2486
1/2+4 2363
13/2−1 2349
1/2+3 2226
3/2−6 1965
1/2+2 1960
9/2+3 1698
3/2−5 1599
5/2+4 1559
11/2+2 1477
9/2−1 1422
1/2+1 1349
1/2−2 1289
5/2+3 1205
11/2+1 1192
13/2+1 1172
5/2+2 1171
3/2−4 1096
9/2+2 1038
5/2−3 1027
3/2−3 831
5/2−2 747
3/2−2 708
7/2+1 590
5/2+1 525
3/2−1 500
9/2+1 198
5/2−1 175
1/2−1 0
J^π_n
S_n = 7416 keV, S_p = 8290 keV, Δ = −69904.897 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93B3, 98B]
$1/2_1^-$	0	11.43 d	$\mu = 0.547\ \mu_n$
$5/2_1^-$	175	79 ns	B(E2→ $1/2_1^-$) = 2.29 W.u., log ft = 5.85 (β^+ from $5/2^-$), $\mu = 1.018\ \mu_n$, (p,d), (d,p)
$9/2_1^+$	198	20.40 ms	B(M2→ $5/2_1^-$) = 0.0588 W.u., Q = 0.34 barn, $\mu = -1.0413\ \mu_n$, (p,d), (d,p), (p,t)
$3/2_1^-$	500		log ft = 7.19 (β^+ from $5/2^-$), (p,d), (d,p)
$5/2_1^+$	525		(p,d), (d,p), (p,t)
$7/2_1^+$	590		log ft = 6.97 (β^+ from $5/2^-$), (d,p), (p,t)
$3/2_2^-$	708		(p,d), (d,p)
$5/2_2^-$	747		(p,d), (d,p)
$3/2_3^-$	831		(p,d)
$5/2_3^-$	1027		log ft = 6.87 (β^+ from $5/2^-$), (p,d)
$9/2_2^+$	1038		(d,p), (p,t)
$3/2_4^-$	1096		log ft = 6.33 (β^+ from $5/2^-$), (p,d), (d,p)
$5/2_2^+$	1171		(p,d), (d,p)
$13/2_1^+$	1172	0.87 ps	B(E2→ $9/2_1^+$) = 42 W.u., (p,t)
$11/2_1^+$	1192	0.90 ps	B(M1/E2→ $9/2_1^+$) = 0.009/23 W.u. (δ = 1.3), (p,t)
$5/2_3^+$	1205		log ft = 7.02 (β^+ from $5/2^-$), (d,p)
$1/2_2^-$	1289		(p,d), (d,p)
$1/2_1^+$	1349		(p,d), (d,p)
$9/2_1^-$	1422	1.0 ps	B(E2→ $5/2_2^-$) = 44 W.u., B(E2→ $5/2_1^-$) = 8.7 W.u.
$11/2_2^+$	1477	0.54 ps	B(E2→ $7/2_1^+$) = 50 W.u., B(M1/E2→ $9/2_1^+$) = 0.00045/9.1 W.u. (δ = 4.7)
$5/2_4^+$	1559		(p,d), (d,p)
$3/2_5^-$	1599		log ft = 6.93 (β^+ from $5/2^-$), (p,d), (d,p)
$9/2_3^+$	1698		(d,p)
$1/2_2^+$	1960		(d,p)
$3/2_6^-$	1965		log ft = 7.16 (β^+ from $5/2^-$), (p,d)
$1/2_3^+$	2226		(p,d), (d,p)
$13/2_1^-$	2349		
$1/2_4^+$	2363		(d,p)
$1/2_5^+$	2486		(p,d), (d,p)
$5/2_5^+$	2523		(d,p)
$1/2_6^+$	2865		(p,d)
$3/2_1^+$	2881		(d,p)
$1/2_7^+$	2960		(d,p)
$5/2_6^+$	3003		(d,p)
$5/2_7^+$	3035		(d,p)
$1/2_8^+$	3087		(d,p)
$1/2_9^+$	3183		(d,p)
$1/2_{10}^+$	3232		(p,d), (d,p)
$3/2_7^-$	3597		(d,p)
$1/2_{11}^+$	3721		(d,p)
$1/2_{12}^+$	3960		(p,d), (d,p)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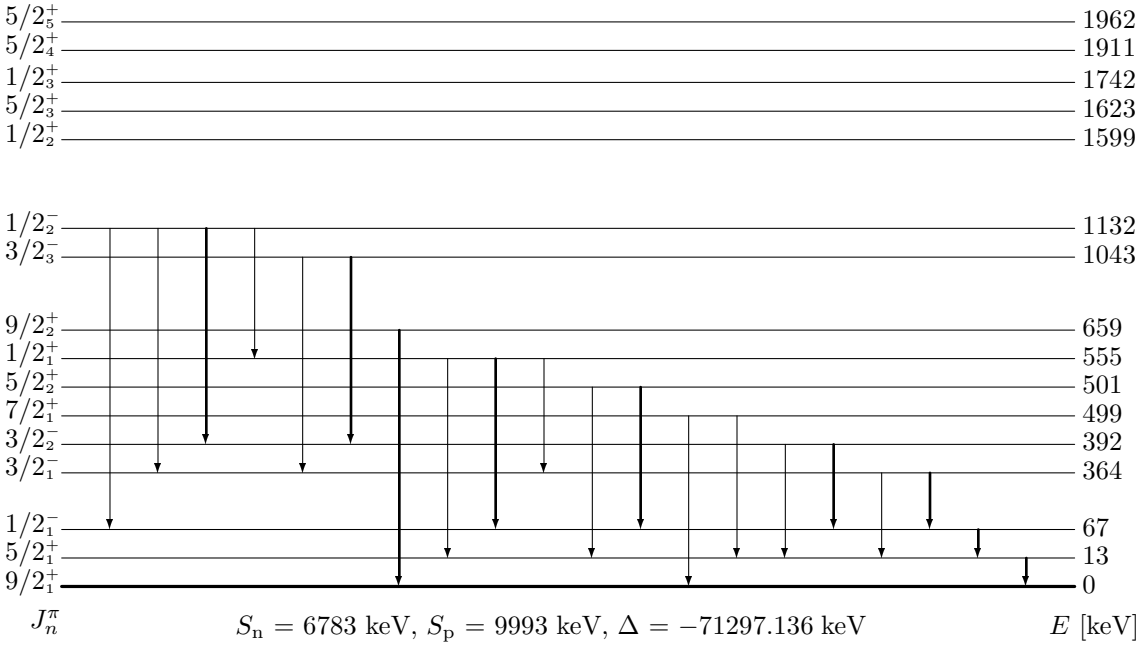
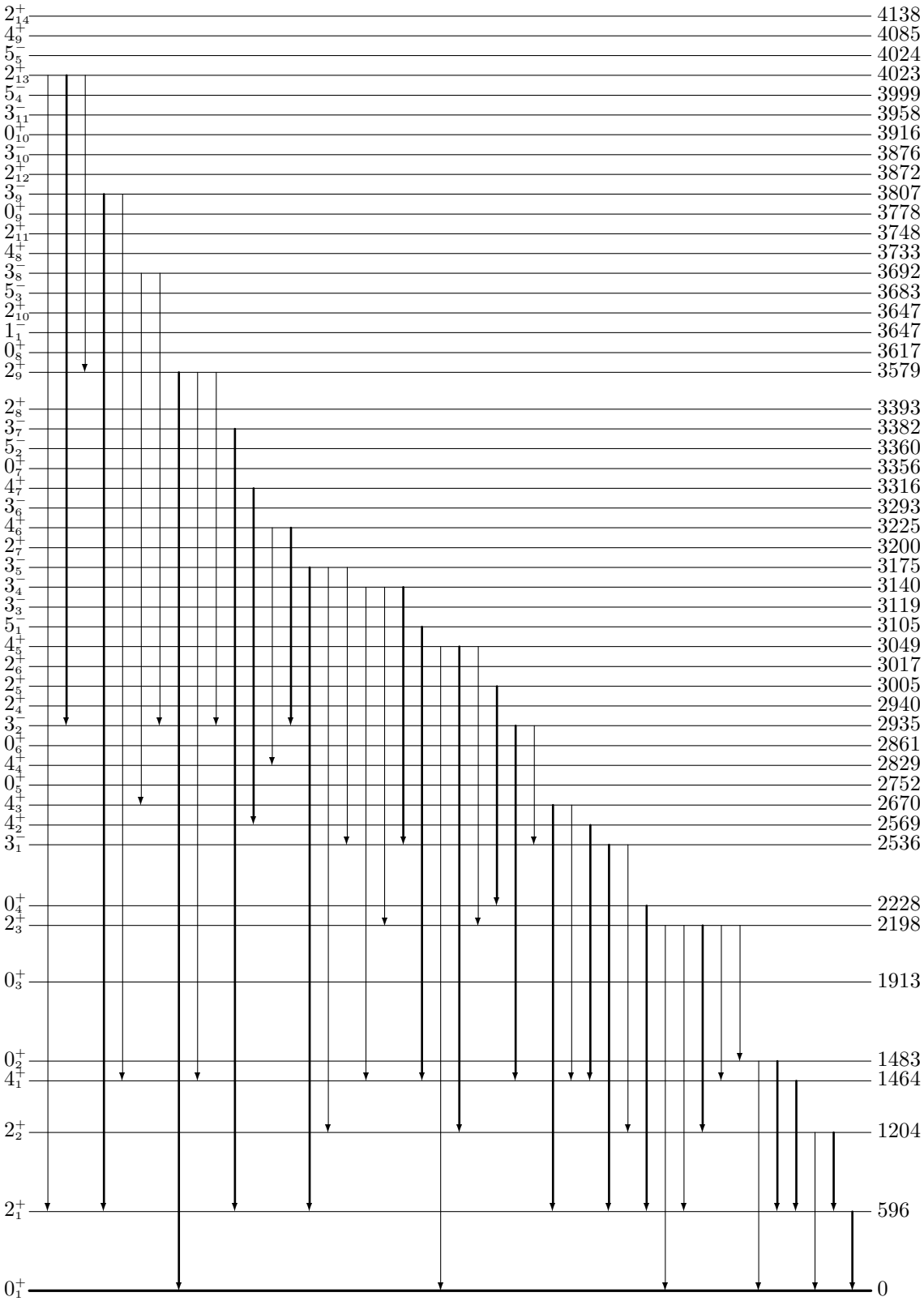
5^-_6 4076
5^-_5 4065
5^-_4 4031
4^+_{11} 4017
2^+_{12} 3966
3^-_5 3965
2^+_{11} 3872
4^+_{10} 3840
5^-_3 3821
7^-_1 3784
8^+_1 3761
3^-_4 3722
2^+_{10} 3709
6^+_2 3667
2^+_9 3619
0^+_6 3586
1^-_2 3536
4^+_9 3528
4^+_8 3511
2^+_8 3509
4^+_7 3427
2^+_7 3420
3^-_3 3409
5^-_2 3394
4^+_6 3378
2^+_6 3327
4^+_5 3182
0^+_5 3139
5^-_1 3129
2^+_5 3094
4^+_4 3080
2^-_1 3036
2^+_4 3034
3^-_2 2943
1^-_1 2940
0^+_4 2897
6^+_1 2772
3^-_1 2515
4^+_3 2464
2^+_3 2402
3^+_1 2065
4^+_2 2049
0^+_3 2029
4^+_1 1728
2^+_2 1464
2^+_1 834
0^+_2 691
0^+_1 0
J^π_n
$S_n = 10752$ keV, $S_p = 9740$ keV, $\Delta = -72585.557$ keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [94C, 98B]
0_1^+	0	stable	log $ft = 9.84$ (β^+ from 2^-)
0_2^+	691	444.2 ns	log $ft = 10.56$ (β^+ from 2^-), Coul. ex., (p,p′), (d,d′), (p,d), (^{3}He,d), (p,t), (t,p)
2_1^+	834	3.35 ps	B(E2→ 0_2^+) = 17.8 W.u., B(E2→ 0_1^+) = 23.5 W.u., log $ft = 8.86$ (β^- from 3^-), log $ft = 7.21$ (β^+ from 2^-), $Q = -0.13$ barn, $\mu = 0.798\ \mu_n$, Coul. ex., (γ,γ'), (e,e'), (p,p′), (d,d′), (α,α'), (p,d), (^{3}He,d), (p,t), (t,p)
2_2^+	1464	4.5 ps	B(M1/E2→ 2_1^+) = 0.00016/62 W.u. ($\delta = -10.3$), B(E2→ 0_2^+) = 0.030 W.u., B(E2→ 0_1^+) = 0.130 W.u., log $ft = 8.53$ (β^- from 3^-), log $ft = 7.69$ (β^+ from 2^-), Coul. ex., (p,p′), (d,d′), (α,α'), (p,d), (^{3}He,d), (p,t), (t,p)
4_1^+	1728	1.55 ps	B(E2→ 2_1^+) = 37 W.u., log $ft = 9.36$ (β^- from 3^-), log $ft = 10.34$ (β^+ from 2^-), Coul. ex., (p,p′), (d,d′), (α,α'), (p,d), (^{3}He,d), (p,t), (t,p)
0_3^+	2029		(p,p′), (^{3}He,d), (p,t), (t,p)
4_2^+	2049		(p,p′), (d,d′), (p,d), (p,t)
3_1^+	2065	≥2 ps	B(M1/E2→ 2_2^+) < 0.0023/ < 150 W.u. ($\delta = 4.0$), log $ft = 8.50$ (β^- from 3^-), log $ft = 9.22$ (β^+ from 2^-), (^{3}He,d), (p,t)
2_3^+	2402		log $ft = 9.14$ (β^- from 3^-), log $ft = 7.92$ (β^+ from 2^-), (p,p′), (d,d′), (^{3}He,d), (p,t), (t,p)
4_3^+	2464	1.4 ps	B(M1→ 4_1^+) = 0.012 W.u., B(E2→ 2_2^+) = 15 W.u., B(E2→ 2_1^+) = 0.05 W.u., log $ft = 9.39$ (β^- from 3^-), (p,p′), (^{3}He,d), (p,t), (t,p)
3_1^-	2515	4.7 ps	B(E1→ 4_3^+) = 0.00057 W.u., B(E1→ 2_3^+) = 0.00074 W.u., B(E1/M2→ 4_1^+) = $4.8 \cdot 10^{-5}$/ < 0.8 W.u. ($\delta = 0.02$), B(E1/M2→ 2_2^+) = $3.9 \cdot 10^{-5}$/16 W.u. ($\delta = -0.31$), B(E3→ 0_1^+) = 29 W.u., log $ft = 7.56$ (β^- from 3^-), log $ft = 7.24$ (β^+ from 2^-), Coul. ex., (γ,γ'), (e,e'), (p,p′), (d,d′), (α,α'), (^{3}He,d), (p,t), (t,p)
6_1^+	2772	0.7 ps	B(E2→ 4_1^+) = 36 W.u., (p,p′)
0_4^+	2897		(p,p′), (^{3}He,d), (t,p)
1_1^-	2940		log $ft = 6.74$ (β^+ from 2^-), (p,p′), (p,d)
3_2^-	2943		log $ft = 7.66$ (β^- from 3^-), log $ft = 7.22$ (β^+ from 2^-), (p,p′), (α,α'), (p,t), (t,p)
2_4^+	3034		(p,p′), (α,α'), (^{3}He,d), (p,t), (t,p)
2_1^-	3036		log $ft = 6.34$ (β^- from 3^-), log $ft = 7.21$ (β^+ from 2^-), (p,d)
4_4^+	3080		(p,p′), (d,d′), (α,α'), (p,d), (^{3}He,d), (p,t), (t,p)
2_5^+	3094		log $ft = 9.70$ (β^- from 3^-), log $ft = 7.51$ (β^+ from 2^-), (p,p′), (α,α'), (^{3}He,d), (p,t)
5_1^-	3129	3.5 ps	B(E2→ 3_1^-) = 29 W.u., (p,p′), (α,α'), (p,d), (t,p)
0_5^+	3139		(p,t)
4_5^+	3182		(p,p′), (^{3}He,d), (p,t)
2_6^+	3327		(p,p′), (^{3}He,d), (p,t), (t,p)
4_6^+	3378		(p,t)
5_2^-	3394		(α,α'), (p,d)
3_3^-	3409		(p,p′), (α,α')
2_7^+	3420		log $ft = 7.59$ (β^+ from 2^-), (p,p′), (^{3}He,d), (p,t)
4_7^+	3427		(t,p)
2_8^+	3509		(p,p′), (^{3}He,d), (p,t)

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [94C, 98B]
4_8^+	3511		(α,α'), (t,p)
4_9^+	3528		(p,p′), (p,t)
1_2^-	3536		(α,α')
0_6^+	3586		(p,t), (t,p)
2_9^+	3619		log ft = 7.74 (β^- from 3^-), log ft = 8.25 (β^+ from 2^-), (^{3}He,d), (t,p)
6_2^+	3667	>2.1 ps	B(E1→ 5_1^-) < 0.0012 W.u., (p,p′), (p,t)
2_{10}^+	3709		log ft = 7.36 (β^- from 3^-), log ft = 7.36 (β^+ from 2^-), (p,p′), (p,t)
3_4^-	3722		(α,α')
8_1^+	3761	0.8 ps	B(E2→ 6_1^+) = 4. · 10^1 W.u.
7_1^-	3784	≥2.8 ps	B(E2→ 5_1^-) < 47 W.u., (p,p′)
5_3^-	3821		(p,p′), (p,t)
4_{10}^+	3840		(p,p′), (α,α'), (t,p)
2_{11}^+	3872		log ft = 8.31 (β^+ from 2^-), (p,p′), (α,α'), (^{3}He,d)
3_5^-	3965		(p,p′), (α,α'), (p,d)
2_{12}^+	3966		(p,p′), (^{3}He,d), (p,t), (t,p)
4_{11}^+	4017		(p,p′), (p,t)
5_4^-	4031		(p,p′), (α,α')
5_5^-	4065		(p,p′), (α,α')
5_6^-	4076		(p,p′), (p,t)
8_2^+	4078	0.8 ps	B(M1→ 8_1^+) = 0.12 W.u., B(E2→ 6_1^+) = 9 W.u.
2_{13}^+	4108		(p,t)
4_{12}^+	4144		(α,α'), (p,t)
0_7^+	4191		(p,t)
3_6^-	4228		(α,α'), (^{3}He,d), (p,t)
3_7^-	4285		(α,α'), (p,t)
3_8^-	4369		(α,α')
3_9^-	4534		(α,α')
9_1^-	4741	0.90 ps	B(E2→ 7_1^-) = 35 W.u.
11_1^-	5838	0.9 ps	B(E2→ 9_1^-) = 22 W.u.



J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93K2, 98B]
$9/2_1^+$	0	stable	$Q = -0.173$ barn, $\mu = -0.8794677\ \mu_n$
$5/2_1^+$	13	2.95 μs	B(E2→ $9/2_1^+$) = 22.9 W.u., $Q = -0.4$ barn, $\mu = -0.0941\ \mu_n$, Coul. ex., (d,p), (p,d)
$1/2_1^-$	67	0.499 s	B(M2→ $5/2_1^+$) = 0.00084 W.u., log ft = 7.21 (β^- from $3/2^-$), log ft = 5.40 (β^+ from $3/2^-$), (d,p), (p,d)
$3/2_1^-$	364		log ft = 5.82 (β^- from $3/2^-$), (d,p), (p,d)
$3/2_2^-$	392		log ft = 6.82 (β^- from $3/2^-$), (d,p), (p,d)
$7/2_1^+$	499	2.2 ps	B(M1/E2→ $5/2_1^+$) = 0.0009/72 W.u. ($\delta = 3.7$), B(M1/E2→ $9/2_1^+$) = 0.0008/6.3 W.u. ($\delta = 1.2$), Coul. ex., (p,p′)
$5/2_2^+$	501		(d,p), (p,d)
$1/2_1^+$	555		log ft = 7.72 (β^- from $3/2^-$), (d,p), (p,d)
$9/2_2^+$	659		(p,p′), (d,p)
$3/2_3^-$	1043		(d,p), (p,d)
$1/2_2^-$	1132		log ft = 5.29 (β^- from $3/2^-$), (d,p), (p,d)
$1/2_2^+$	1599		(d,p)
$5/2_3^+$	1623		(p,p′), (d,p), (p,d)
$1/2_3^+$	1742		(d,p), (p,d)
$5/2_4^+$	1911		(d,p)
$5/2_5^+$	1962		(d,p)
$1/2_4^+$	2067		(d,p)
$5/2_6^+$	2225		(d,p)
$3/2_1^+$	2319		(d,p)
$1/2_5^+$	2374		(d,p)
$1/2_6^+$	2459		(d,p), (p,d)
$5/2_7^+$	2576		(d,p)
$1/2_7^+$	2915		(d,p)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3^-_9 3807
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2^+_{11} 3748
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3^-_8 3692
5^-_3 3683
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2^+_9 3579
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2^+_4 2940
3^-_2 2935
0^+_6 2861
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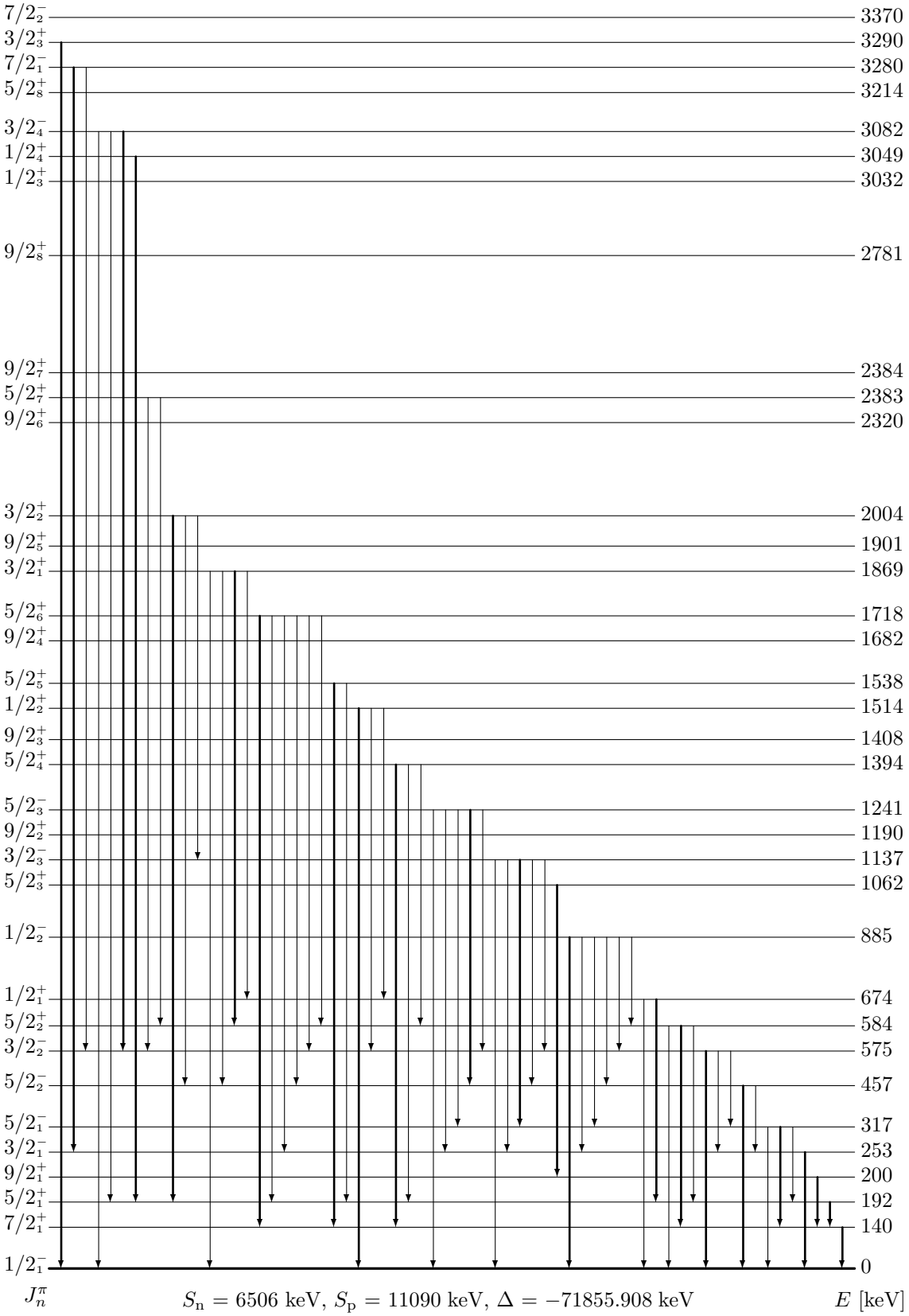
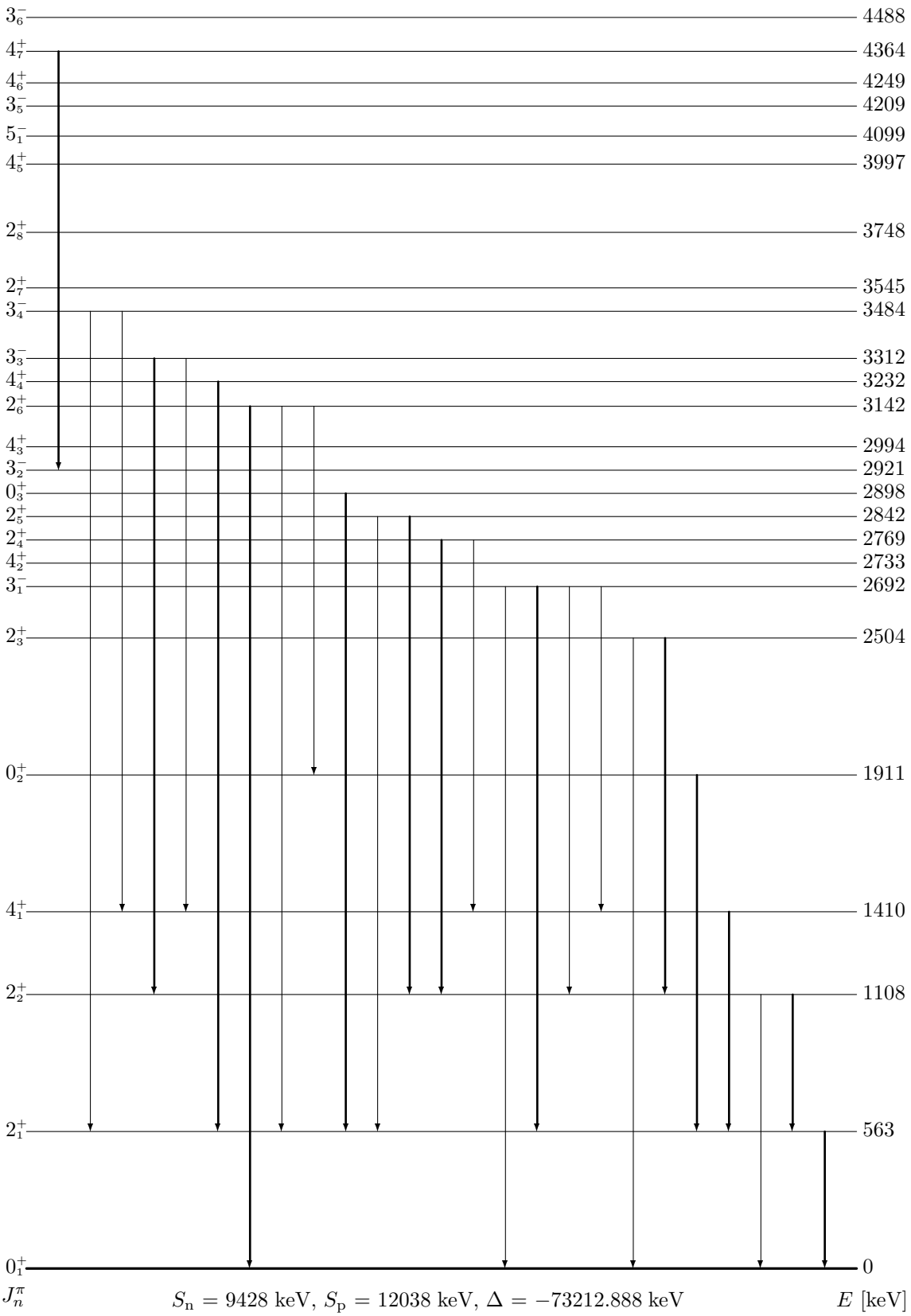
4^+_2 2569
3^-_1 2536
0^+_4 2228
2^+_3 2198
0^+_3 1913
0^+_2 1483
4^+_1 1464
2^+_2 1204
2^+_1 596
0^+_1 0
J^π_n
$S_n = 10196$ keV, $S_p = 11007$ keV, $\Delta = -73422.011$ keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95F, 98B]
0_1^+	0	stable	log ft = 9.70 (β^+ from 2^-), (γ,γ'), Coul. ex., (p,p′), (d,d′), (α,α'), (d,p), (d,^{3}He), (p,t), (t,p)
2_1^+	596	12.37 ps	B(E2→ 0_1^+) = 33.1 W.u., log ft = 7.97 (β^- from (3^-)), log ft = 6.96 (β^+ from 2^-), Q = −0.25 barn, μ = 0.87 μ_n
2_2^+	1204	5.1 ps	B(M1/E2→ 2_1^+) = 0.00105/45 W.u. (δ = 3.4), B(E2→ 0_1^+) = 0.75 W.u., log ft = 8.30 (β^- from (3^-)), log ft = 8.25 (β^+ from 2^-), μ = 0.82 μ_n
4_1^+	1464	1.7 ps	B(E2→ 2_1^+) = 37 W.u., log ft = 7.89 (β^- from (3^-)), log ft = 11.28 (β^+ from 2^-), Coul. ex., (p,p′), (d,d′), (α,α'), (d,p), (d,^{3}He), (p,t), (t,p)
0_2^+	1483	<2.6 ps	B(E2→ 2_1^+) > 21 W.u., log ft = 8.90 (β^- from (3^-)), log ft = 10.34 (β^+ from 2^-), (γ,γ'), Coul. ex., (p,p′), (α,α'), (p,t), (t,p)
0_3^+	1913		(d,p), (t,p)
2_3^+	2198		log ft = 8.26 (β^- from (3^-)), log ft = 8.28 (β^+ from 2^-), (γ,γ'), (p,p′), (d,d′), (d,^{3}He), (p,t), (t,p)
0_4^+	2228		(γ,γ'), (p,p′), (d,^{3}He), (t,p)
3_1^-	2536		log ft = 7.65 (β^- from (3^-)), (p,p′), (d,d′), (α,α'), (d,p), (p,t), (t,p)
4_2^+	2569		(p,p′), (α,α'), (d,p), (p,t), (t,p)
4_3^+	2670		(p,p′), (d,d′), (α,α'), (d,p), (p,t), (t,p)
0_5^+	2752		(p,p′), (t,p)
4_4^+	2829		(p,p′)
0_6^+	2861		(p,p′), (d,^{3}He), (p,t), (t,p)
3_2^-	2935		(α,α'), (d,p), (d,^{3}He), (t,p)
2_4^+	2940		(p,t)
2_5^+	3005		(γ,γ'), (p,p′), (α,α'), (d,^{3}He)
2_6^+	3017		(p,p′), (α,α'), (d,^{3}He), (p,t), (t,p)
4_5^+	3049		(p,p′), (α,α'), (p,t), (t,p)
5_1^-	3105		(p,p′), (α,α'), (t,p)
3_3^-	3119		(d,p)
3_4^-	3140		log ft = 6.73 (β^- from (3^-)), (p,p′), (d,d′), (α,α'), (p,t), (t,p)
3_5^-	3175		log ft = 6.89 (β^- from (3^-)), (p,p′), (α,α'), (d,^{3}He)
2_7^+	3200		(p,p′), (α,α'), (d,^{3}He), (p,t)
4_6^+	3225		(p,p′), (α,α'), (d,^{3}He), (p,t), (t,p)
3_6^-	3293		(d,p)
4_7^+	3316		(α,α'), (d,^{3}He)
0_7^+	3356		(t,p)
5_2^-	3360		(p,p′), (α,α'), (p,t)
3_7^-	3382		log ft = 7.20 (β^- from (3^-)), (p,p′), (α,α'), (d,^{3}He), (p,t)
2_8^+	3393		(p,p′), (d,d′), (d,^{3}He), (p,t), (t,p)
2_9^+	3579		(p,p′), (α,α'), (d,^{3}He), (p,t), (t,p)
0_8^+	3617		(p,p′), (α,α'), (p,t)
1_1^-	3647		(p,p′), (α,α')
2_{10}^+	3647		(p,p′), (p,t)
5_3^-	3683		(t,p)
3_8^-	3692		(p,p′), (α,α')
4_8^+	3733		(p,p′), (α,α'), (d,p), (t,p)
2_{11}^+	3748		(p,p′), (α,α'), (d,p), (p,t)
0_9^+	3778		(p,p′), (α,α'), (p,t), (t,p)

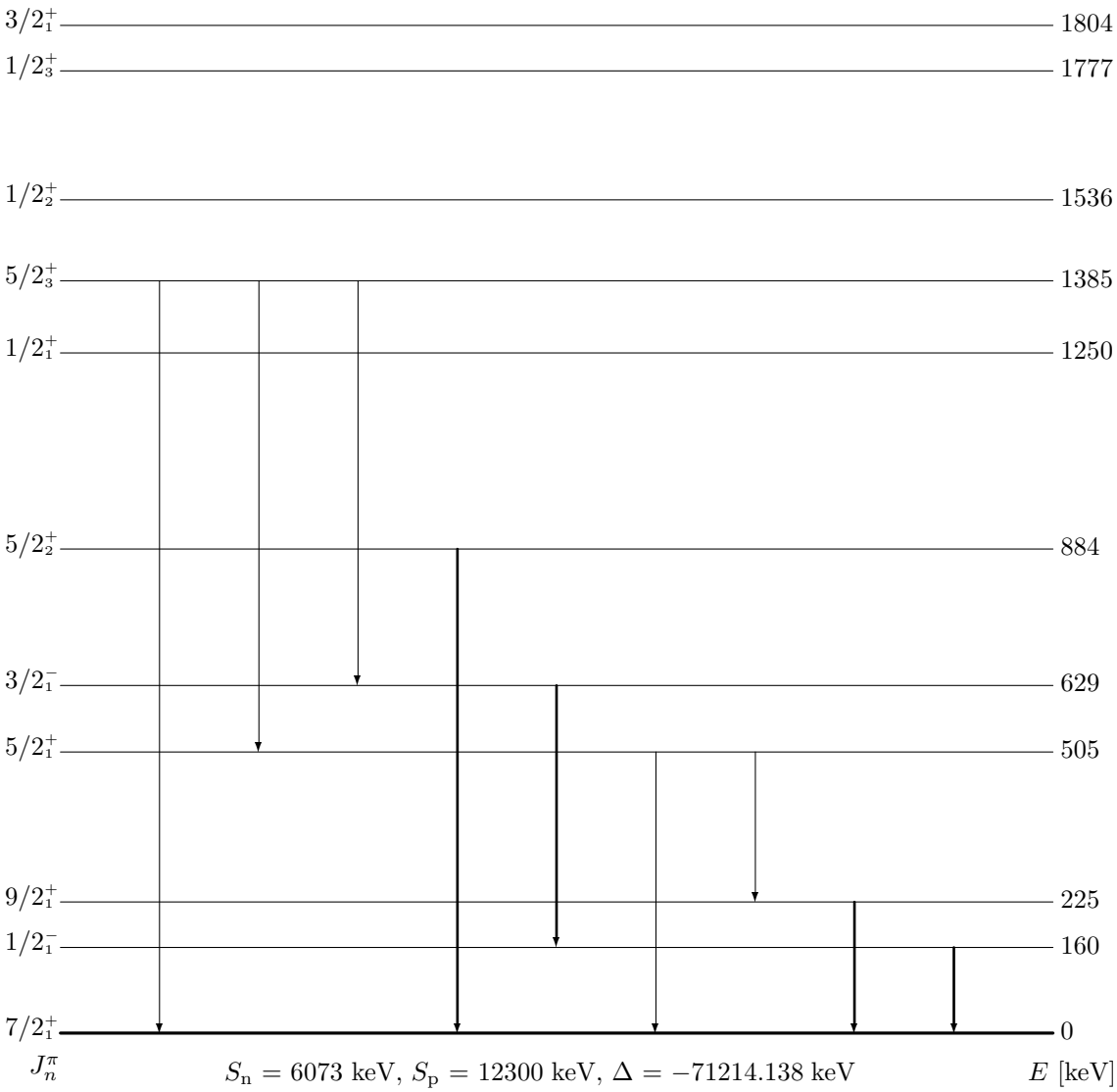
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95F, 98B]
3_9^-	3807		(α, α')
2_{12}^+	3872		(p,t), (t,p)
3_{10}^-	3876		(p,p′), (α, α')
0_{10}^+	3916		(p,p′), (p,t), (t,p)
3_{11}^-	3958		(α, α')
5_4^-	3999		(α, α'), (d,p)
2_{13}^+	4023		(t,p)
5_5^-	4024		(p,p′), (α, α'), (p,t)
4_9^+	4085		(p,p′), (α, α'), (p,t), (t,p)
2_{14}^+	4138		(p,p′), (p,t)
2_{15}^+	4164		(p,p′), (p,t)
3_{12}^-	4174		(p,p′), (d,p), (t,p)
2_{16}^+	4202		log ft = 5.87 (β^- from (3^-)), (p,p′), (p,t), (t,p)
0_{11}^+	4239		(p,t)
2_{17}^+	4290		(p,t), (t,p)
4_{10}^+	4320		(p,p′), (p,t), (t,p)
4_{11}^+	4353		(p,p′), (d,p), (t,p)
2_{18}^+	4387		(p,p′), (d,p), (p,t), (t,p)
2_{19}^+	4414		(d,p), (t,p)
4_{12}^+	4493		(d,p), (p,t), (t,p)
0_{12}^+	4535		(p,t)
2_{20}^+	4538		(t,p)
4_{13}^+	4586		(t,p)
2_{21}^+	4591		(p,t)
3_{13}^-	4594		(d,p)
4_{14}^+	4664		(p,t)
1_2^-	6018		(γ, γ'), (d,p)


7/2$_2^-$ 3370
3/2$_3^+$ 3290
7/2$_1^-$ 3280
5/2$_8^+$ 3214
3/2$_4^-$ 3082
1/2$_4^+$ 3049
1/2$_3^+$ 3032
9/2$_8^+$ 2781
9/2$_7^+$ 2384
5/2$_7^+$ 2383
9/2$_6^+$ 2320
3/2$_2^+$ 2004
9/2$_5^+$ 1901
3/2$_1^+$ 1869
5/2$_6^+$ 1718
9/2$_4^+$ 1682
5/2$_5^+$ 1538
1/2$_2^+$ 1514
9/2$_3^+$ 1408
5/2$_4^+$ 1394
5/2$_3^-$ 1241
9/2$_2^+$ 1190
3/2$_3^-$ 1137
5/2$_3^+$ 1062
1/2$_2^-$ 885
1/2$_1^+$ 674
5/2$_2^+$ 584
3/2$_2^-$ 575
5/2$_2^-$ 457
5/2$_1^-$ 317
3/2$_1^-$ 253
9/2$_1^+$ 200
5/2$_1^+$ 192
7/2$_1^+$ 140
1/2$_1^-$ 0
J_n^π
S_n = 6506 keV, S_p = 11090 keV, Δ = −71855.908 keV
E [keV]

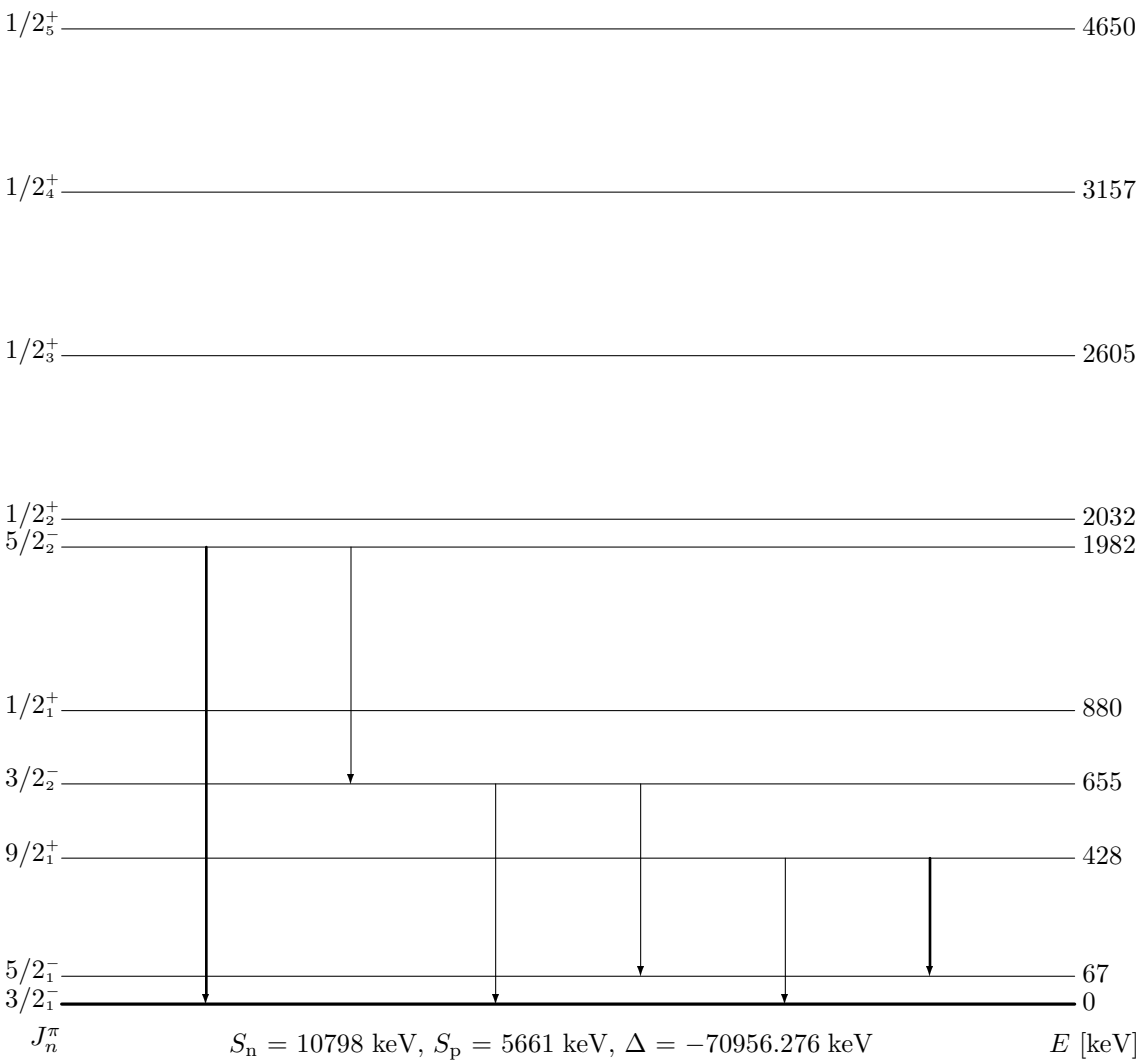
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [90F, 98B]
$1/2_1^-$	0	82.78 m	$\mu = 0.510\ \mu_n$
$7/2_1^+$	140	47.7 s	$B(\text{E3}\rightarrow 1/2_1^-) = 0.0283$ W.u.
$5/2_1^+$	192	216 ns	$B(\text{M1/E2}\rightarrow 7/2_1^+) = 7.6 \cdot 10^{-5}/32$ W.u. ($\delta = 0.9$), (p,d), (d,p), (d,t)
$9/2_1^+$	200		(p,d), (d,p), (d,t), (t,p)
$3/2_1^-$	253		(p,d), (d,p), (d,t)
$5/2_1^-$	317		(p,d), (d,p), (d,t)
$5/2_2^-$	457		(p,d), (d,p), (d,t)
$3/2_2^-$	575		(p,d), (d,p), (d,t)
$5/2_2^+$	584		(p,d), (d,p), (t,p)
$1/2_1^+$	674		(p,d), (d,p), (d,t)
$1/2_2^-$	885		(p,d), (d,p), (d,t)
$5/2_3^+$	1062		(t,p)
$3/2_3^-$	1137		(d,p), (d,t)
$9/2_2^+$	1190		(t,p)
$5/2_3^-$	1241		(p,d), (d,p), (d,t)
$5/2_4^+$	1394		(p,d), (d,p)
$9/2_3^+$	1408		(t,p)
$1/2_2^+$	1514		(d,p)
$5/2_5^+$	1538		(p,d), (d,p), (t,p)
$9/2_4^+$	1682		(t,p)
$5/2_6^+$	1718		(d,p), (t,p)
$3/2_1^+$	1869		(p,d), (d,p)
$9/2_5^+$	1901		(t,p)
$3/2_2^+$	2004		(d,p), (t,p)
$9/2_6^+$	2320		(t,p)
$5/2_7^+$	2383		(d,p)
$9/2_7^+$	2384		(p,d), (t,p)
$9/2_8^+$	2781		(t,p)
$1/2_3^+$	3032		(d,p)
$1/2_4^+$	3049		(d,p)
$3/2_4^-$	3082		(t,p)
$5/2_8^+$	3214		(d,p), (t,p)
$7/2_1^-$	3280		(p,d), (t,p)
$3/2_3^+$	3290		(d,p)
$7/2_2^-$	3370		(t,p)


3_6^- 4488
4_7^+ 4364
4_6^+ 4249
3_5^- 4209
5_1^- 4099
4_5^+ 3997
2_8^+ 3748
2_7^+ 3545
3_4^- 3484
3_3^- 3312
4_4^+ 3232
2_6^+ 3142
4_3^+ 2994
3_2^- 2921
0_3^+ 2898
2_5^+ 2842
2_4^+ 2769
4_2^+ 2733
3_1^- 2692
2_3^+ 2504
0_2^+ 1911
4_1^+ 1410
2_2^+ 1108
2_1^+ 563
0_1^+ 0
J_n^π
S_n = 9428 keV, S_p = 12038 keV, Δ = −73212.888 keV
E [keV]

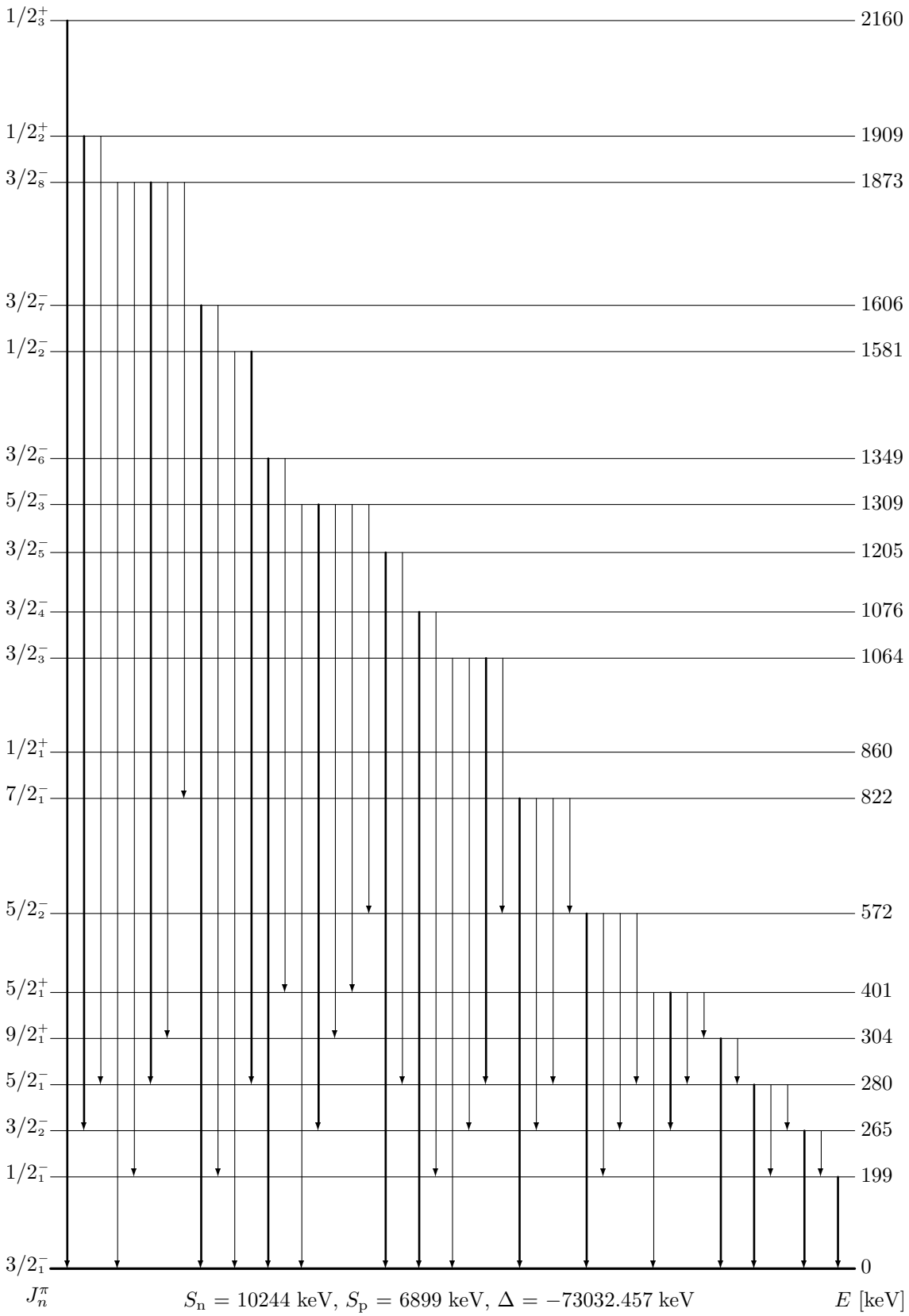
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95S, 98B]
0_1^+	0	stable	Coul. ex., (p,p′), (α,α'), (t,p)
2_1^+	563	18.2 ps	B(E2→ 0_1^+) = 29 W.u., log ft = 6.83 (β^- from (3)), Q = −0.19 barn, μ = 0.838 μ_n
2_2^+	1108	8.0 ps	B(E2/M1→ 2_1^+) = 42/8·10^{-4} W.u. (δ = 3.5), B(E2→ 0_1^+) = 0.90 W.u., log ft = 6.80 (β^- from (3)), Coul. ex., (p,p′), (α,α'), (t,p)
4_1^+	1410	1.8 ps	B(E2→ 2_1^+) = 38 W.u., log ft = 7.90 (β^- from (3)), Coul. ex., (p,p′), (α,α'), (t,p)
0_2^+	1911	>0.8 ps	B(E2→ 2_1^+) < 7.4 W.u., log ft = 8.20 (β^- from (3)), Coul. ex., (p,p′), (α,α'), (t,p)
2_3^+	2504	0.24 ps	B(E2→ 0_1^+) = 0.4 W.u., (p,p′), (t,p)
3_1^-	2692	0.28 ps	B(E3→ 0_1^+) = 700 W.u., log ft = 7.40 (β^- from (3)), (p,p′), (α,α'), (t,p)
4_2^+	2733	0.17 ps	(p,p′), (α,α'), (t,p)
2_4^+	2769		log ft = 7.30 (β^- from (3)), (p,p′), (α,α'), (t,p)
2_5^+	2842	0.028 ps	log ft = 7.40 (β^- from (3)), (p,p′), (t,p)
0_3^+	2898		(p,p′), (t,p)
3_2^-	2921		(p,p′), (α,α')
4_3^+	2994		(p,p′), (α,α'), (t,p)
2_6^+	3142	0.06 ps	B(E2→ 0_1^+) = 1.1 W.u., log ft = 6.60 (β^- from (3)), (p,p′), (t,p)
4_4^+	3232		log ft = 7.70 (β^- from (3)), (p,p′), (α,α'), (t,p)
3_3^-	3312		log ft = 7.60 (β^- from (3)), (p,p′), (α,α'), (t,p)
3_4^-	3484		(p,p′), (α,α')
2_7^+	3545		(p,p′), (α,α'), (t,p)
2_8^+	3748		(p,p′), (α,α')
4_5^+	3997		(p,p′), (α,α')
5_1^-	4099		(p,p′), (α,α')
3_5^-	4209		(p,p′), (α,α')
4_6^+	4249		(p,p′), (α,α')
4_7^+	4364		log ft = 6.00 (β^- from (3)), (p,p′), (α,α')
3_6^-	4488		(p,p′), (α,α')



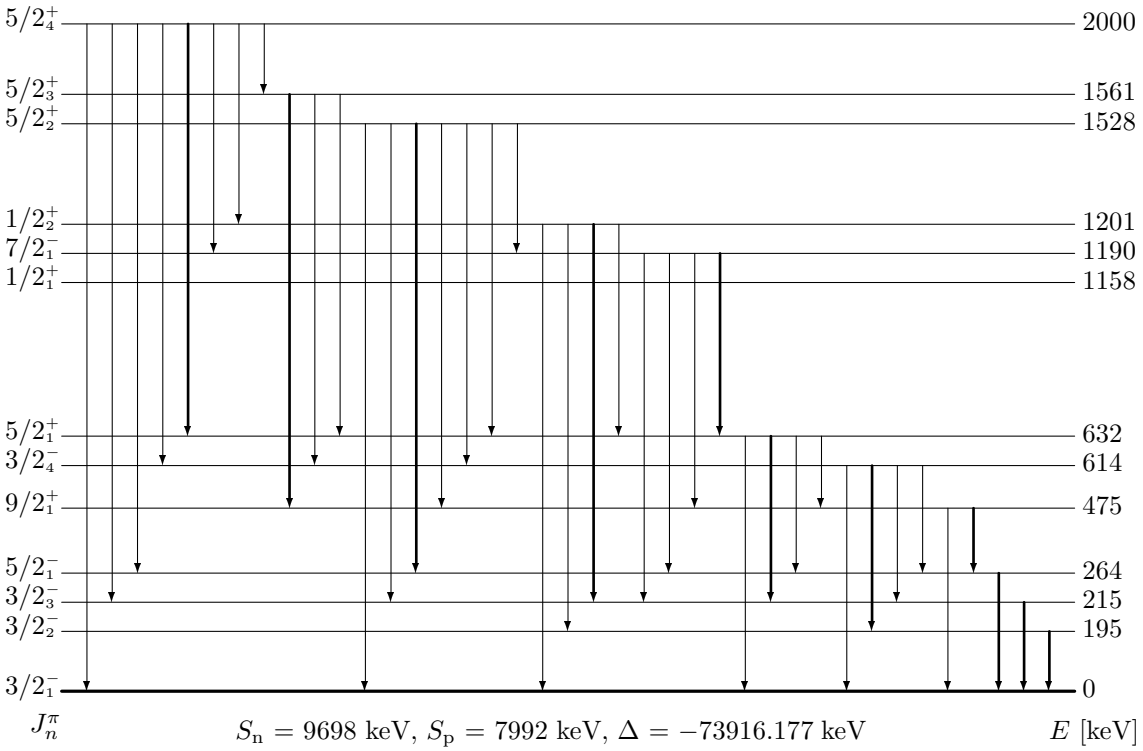
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [97F, 98B]
$7/2_1^+$	0	11.30 h	(d,p)
$1/2_1^-$	160	52.9 s	B(E3→ $7/2_1^+$) = 0.0028 W.u., (d,p)
$9/2_1^+$	225		(d,p)
$5/2_1^+$	505		(d,p)
$3/2_1^-$	629		(d,p)
$5/2_2^+$	884		(d,p)
$1/2_1^+$	1250		(d,p)
$5/2_3^+$	1385		(d,p)
$1/2_2^+$	1536		(d,p)
$1/2_3^+$	1777		(d,p)
$3/2_1^+$	1804		(d,p)



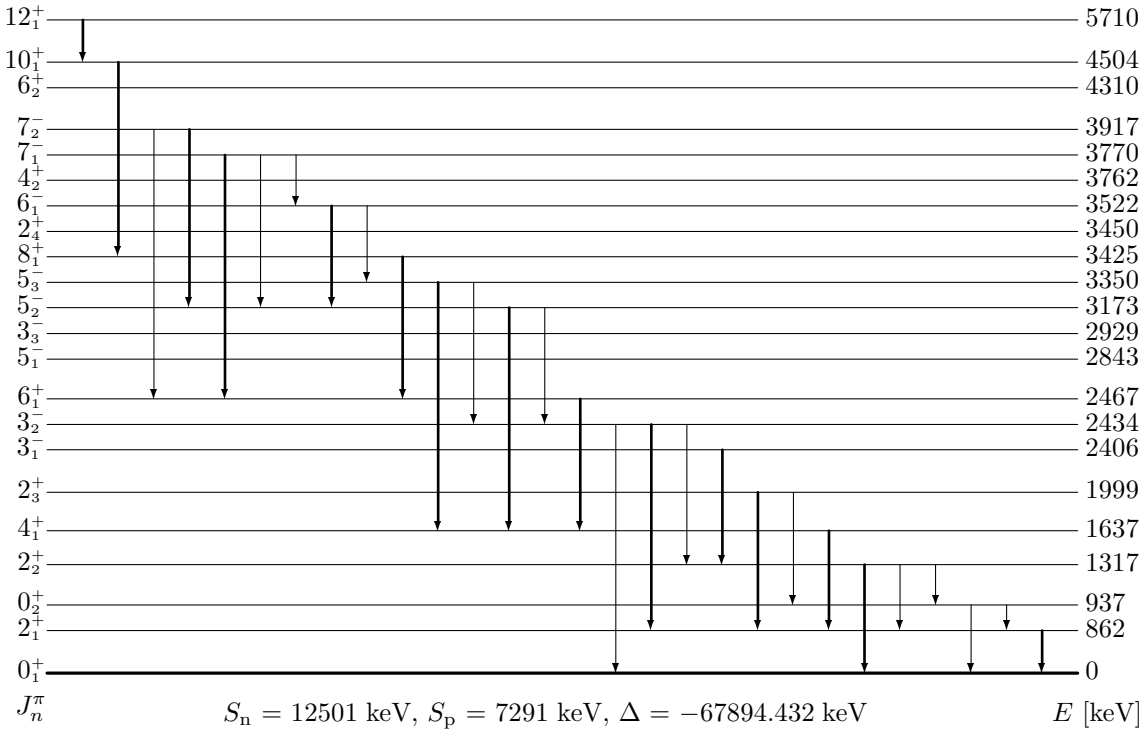
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93K2, 98B]
$3/2_1^-$	0	80.30 d	log ft = 5.60 (β^+ from $3/2^-$), (d,^{3}He), (^{3}He,d), (p,t)
$5/2_1^-$	67	4.95 ns	B(M1/E2→ $3/2_1^-$) = 0.0115/4 W.u. (δ = 0.035), log ft = 8.80 (β^+ from $9/2^+$), log ft = 6.30 (β^+ from $3/2^-$), Q = 0.356 barn, μ = 1.63 μ_n, (d,^{3}He), (^{3}He,d)
$9/2_1^+$	428	5.7 μs	B(M2→ $5/2_1^-$) = 0.050 W.u., B(E3→ $3/2_1^-$) = 0.20 W.u., log ft = 5.40 (β^+ from $9/2^+$), μ = 5.234 μ_n, (d,^{3}He), (^{3}He,d)
$3/2_2^-$	655		log ft = 5.80 (β^+ from $3/2^-$), (d,^{3}He), (^{3}He,d), (p,t)
$1/2_1^+$	880		(d,^{3}He), (^{3}He,d)
$5/2_2^-$	1982		log ft = 6.80 (β^+ from $3/2^-$), (^{3}He,d)
$1/2_2^+$	2032		(^{3}He,d)
$1/2_3^+$	2605		(^{3}He,d)
$1/2_4^+$	3157		(^{3}He,d)
$1/2_5^+$	4650		(^{3}He,d)


1/2+3
2160
1/2+2
1909
3/2−8
1873
3/2−7
1606
1/2−2
1581
3/2−6
1349
5/2−3
1309
3/2−5
1205
3/2−4
1076
3/2−3
1064
1/2+1
860
7/2−1
822
5/2−2
572
5/2+1
401
9/2+1
304
5/2−1
280
3/2−2
265
1/2−1
199
3/2−1
0
J^π_n
S_n = 10244 keV, S_p = 6899 keV, Δ = −73032.457 keV
E [keV]

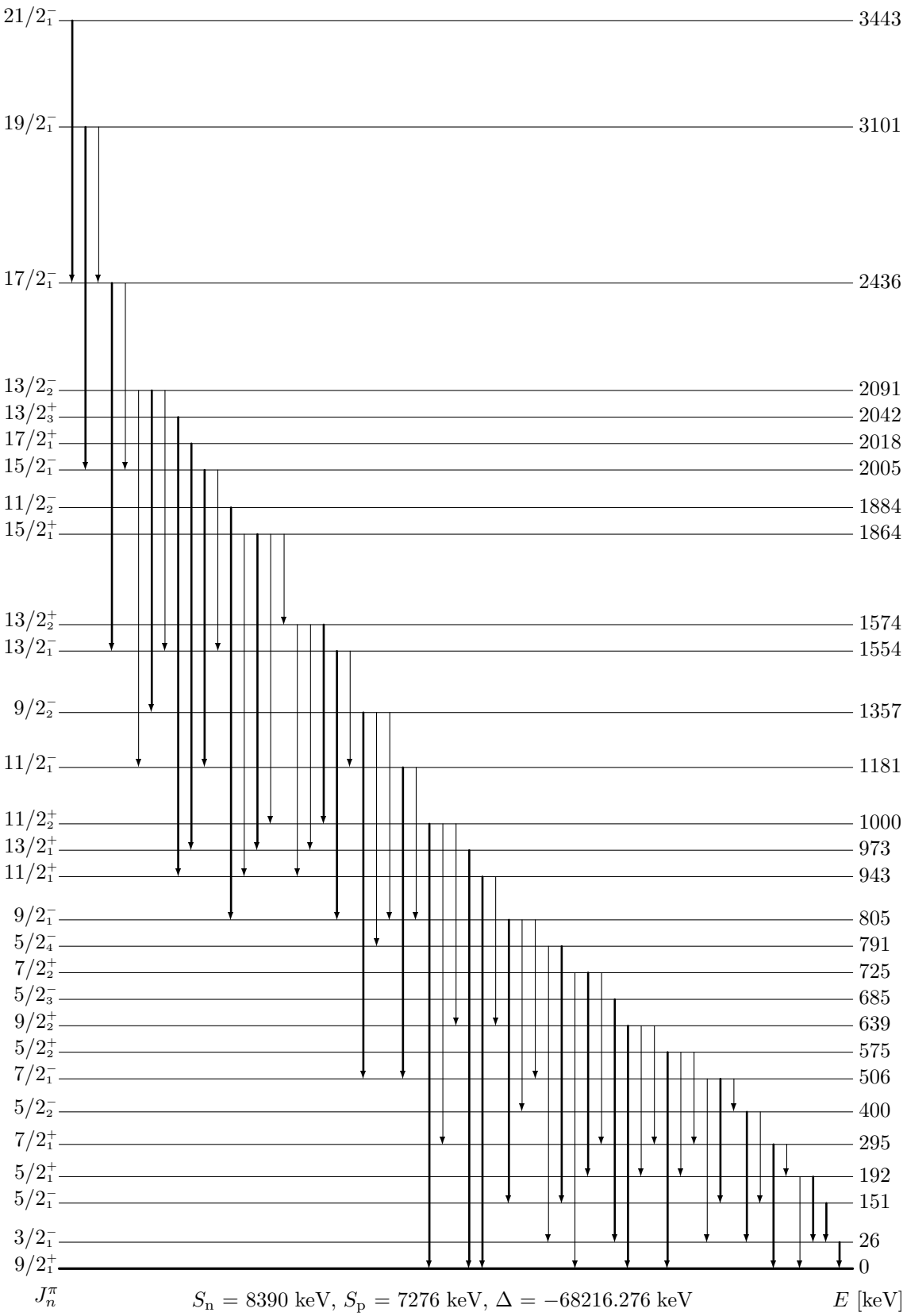
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [90F, 98B]
$3/2_1^-$	0	stable	log $ft = 5.18$ (β^- from $1/2^-$), log $ft = 8.60$ (β^+ from $5/2^+$), $Q = 0.314$ barn, $\mu = 1.43947\ \mu_n$
$1/2_1^-$	199	885 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.00270/14 W.u. ($\delta = 0.39$), log $ft = 6.88$ (β^- from $1/2^-$)
$3/2_2^-$	265	11.2 ps	B(M1/E2$\rightarrow 1/2_1^-$) = $0.121/1.1 \cdot 10^3$ W.u. ($\delta = 0.17$), B(M1/E2$\rightarrow 3/2_1^-$) = $0.101/2. \cdot 10^1$ W.u. ($\delta = -0.11$), log $ft = 5.63$ (β^- from $1/2^-$), log $ft = 8.00$ (β^+ from $5/2^+$)
$5/2_1^-$	280	280 ps	B(M1/E2$\rightarrow 3/2_2^-$) = $0.0006/3.4 \cdot 10^3$ W.u., B(E2$\rightarrow 1/2_1^-$) = 10 W.u., B(M1/E2$\rightarrow 3/2_1^-$) = 0.0028/13 W.u. ($\delta = -0.51$), log $ft = 7.90$ (β^+ from $5/2^+$), $\mu = 0.81\ \mu_n$
$9/2_1^+$	304	16.79 ms	B(M2/E3$\rightarrow 5/2_1^-$) = $0.044/4.0 \cdot 10^2$ W.u. ($\delta = 0.05$), B(E3$\rightarrow 3/2_1^-$) = 0.161 W.u., log $ft = 11.00$ (β^+ from $5/2^+$)
$5/2_1^+$	401	1.67 ns	B(E2$\rightarrow 9/2_1^+$) = 76 W.u., B(E1$\rightarrow 5/2_1^-$) = $2.30 \cdot 10^{-5}$ W.u., B(E1$\rightarrow 3/2_2^-$) = $5.50 \cdot 10^{-5}$ W.u., B(E1$\rightarrow 3/2_1^-$) = $4.24 \cdot 10^{-7}$ W.u., log $ft = 9.80$ (β^- from $1/2^-$), log $ft = 6.22$ (β^- from $7/2^+$), log $ft = 6.10$ (β^+ from $5/2^+$)
$5/2_2^-$	572	2.9 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.032/24 W.u. ($\delta = 0.43$), B(E2$\rightarrow 1/2_1^-$) = 91 W.u., log $ft = 9.10$ (β^+ from $5/2^+$)
$7/2_1^-$	822	3.0 ps	B(M1/E2$\rightarrow 5/2_2^-$) = $0.057/1.2 \cdot 10^3$ W.u., B(M1/E2$\rightarrow 5/2_1^-$) = 0.0075/35 W.u., B(E2$\rightarrow 3/2_2^-$) = 17 W.u., B(E2$\rightarrow 3/2_1^-$) = 9.3 W.u., (γ,γ'), Coul. ex., (^{3}He,d), (d,^{3}He)
$1/2_1^+$	860		(^{3}He,d), (d,^{3}He)
$3/2_3^-$	1064		Coul. ex., (^{3}He,d)
$3/2_4^-$	1076	0.20 ps	(γ,γ'), Coul. ex., (^{3}He,d), (d,^{3}He)
$3/2_5^-$	1205		(γ,γ'), (^{3}He,d), (d,^{3}He)
$5/2_3^-$	1309		(d,^{3}He)
$3/2_6^-$	1349	0.12 ps	(γ,γ'), (^{3}He,d)
$1/2_2^-$	1581		
$3/2_7^-$	1606		(γ,γ'), (d,^{3}He)
$3/2_8^-$	1873		(γ,γ'), (d,^{3}He)
$1/2_2^+$	1909		(^{3}He,d)
$1/2_3^+$	2160		



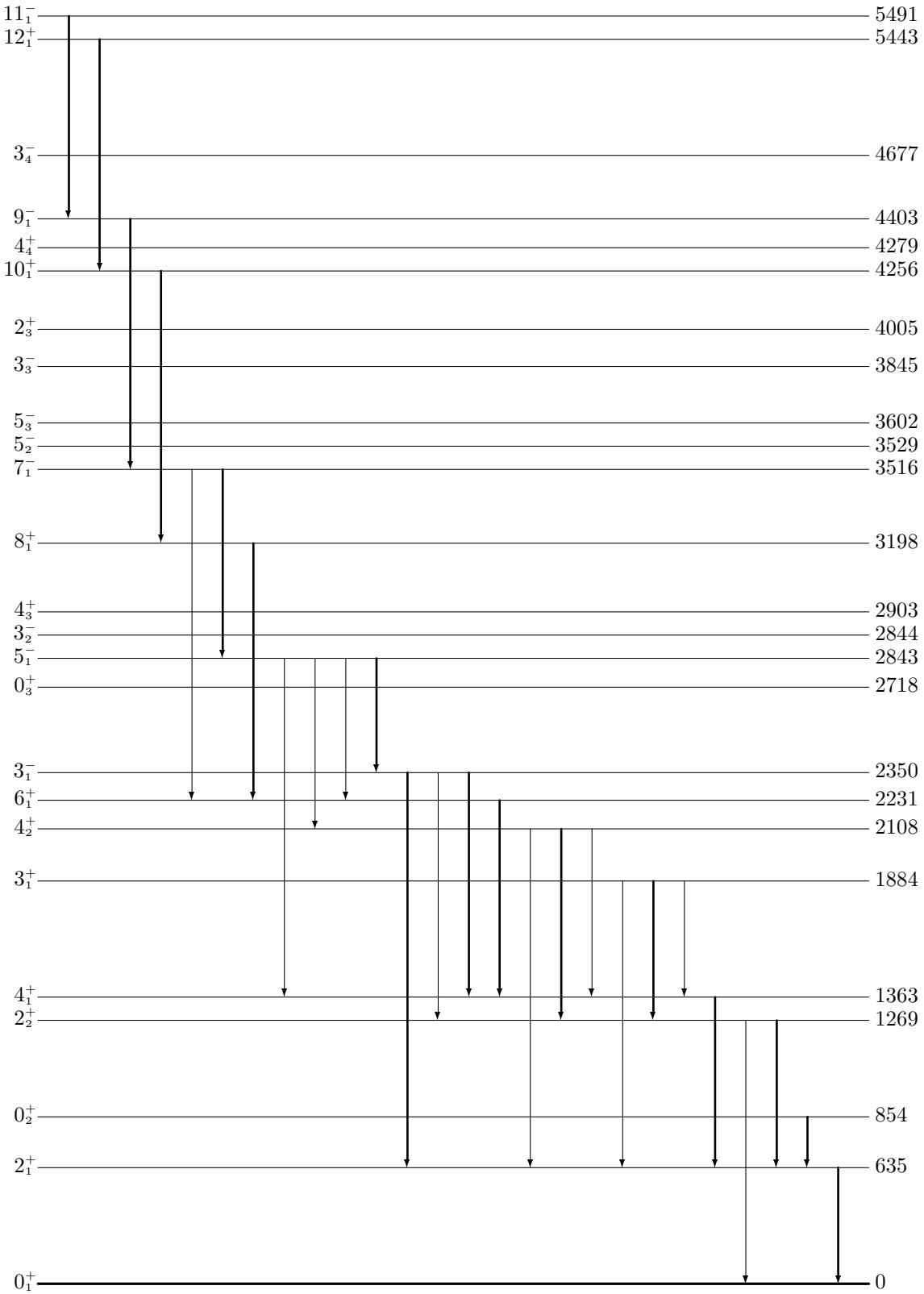
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [97F, 98B]
$3/2_1^-$	0	38.83 h	log ft = 4.95 (β^- from $1/2^-$), (^{3}He,d), (d,^{3}He)
$3/2_2^-$	195	7.4 ns	B(M1/E2→ $3/2_1^-$) < 0.00041/ < 14 W.u., log ft = 9.66 (β^- from $7/2^+$), log ft = 7.33 (β^- from $1/2^-$), (^{3}He,d), (d,^{3}He)
$3/2_3^-$	215	<0.3 ns	B(M1/E2→ $3/2_1^-$) > 0.0070/ > 4.4 W.u. (δ = −0.164), log ft = 9.87 (β^- from $7/2^+$), log ft = 5.23 (β^- from $1/2^-$), (^{3}He,d), (d,^{3}He)
$5/2_1^-$	264	0.304 ns	B(M1/E2→ $3/2_1^-$) = 0.00351/6.8 W.u. (δ = −0.32), log ft = 8.84 (β^- from $7/2^+$), μ = 0.736 μ_n, (^{3}He,d), (d,^{3}He)
$9/2_1^+$	475	114.0 μs	B(M2/E3→ $5/2_1^-$) = 0.0321/14.5 W.u. (δ = 0.100), B(E3→ $3/2_1^-$) = 0.160 W.u., log ft = 7.96 (β^- from $7/2^+$), μ = 5.525 μ_n, (^{3}He,d), (d,^{3}He)
$3/2_4^-$	614		log ft = 10.23 (β^- from $7/2^+$), log ft = 7.23 (β^- from $1/2^-$), (d,^{3}He)
$5/2_1^+$	632	60 ps	B(E2→ $9/2_1^+$) = 96 W.u., B(E1→ $5/2_1^-$) = $4.0 \cdot 10^{-5}$ W.u., B(E1→ $3/2_3^-$) = $4.3 \cdot 10^{-5}$ W.u., B(E1→ $3/2_1^-$) = $3.9 \cdot 10^{-6}$ W.u., log ft = 7.70 (β^- from $7/2^+$), μ = 2.53 μ_n, (^{3}He,d), (d,^{3}He)
$1/2_1^+$	1158		(^{3}He,d)
$7/2_1^-$	1190	<0.2 ns	B(E1/M2→ $5/2_1^+$) > $7.0 \cdot 10^{-6}$/ > 1.8 W.u. (δ = −0.139), log ft = 7.19 (β^- from $7/2^+$), (^{3}He,d)
$1/2_2^+$	1201		(d,^{3}He)
$5/2_2^+$	1528		log ft = 7.78 (β^- from $7/2^+$), (^{3}He,d)
$5/2_3^+$	1561	<0.1 ns	log ft = 7.12 (β^- from $7/2^+$)
$5/2_4^+$	2000		log ft = 6.29 (β^- from $7/2^+$)



J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [94C, 98B]
0_1^+	0	8.40 d	(p,t)
2_1^+	862	3.0 ps	B(E2→ 0_1^+) = 22.3 W.u., log ft = 6.56 (β^+ from 3^+), (p,t)
0_2^+	937	17.5 ns	(p,t)
2_2^+	1317	10.0 ps	B(E2→ 0_2^+) = 67 W.u., B(E2→ 0_1^+) = 0.38 W.u., log ft = 6.50 (β^+ from 3^+)
4_1^+	1637	2.2 ps	B(E2→ 2_1^+) = 52 W.u., log ft = 6.85 (β^+ from 3^+)
2_3^+	1999		log ft = 6.78 (β^+ from 3^+)
3_1^-	2406	<1.0 ps	B(E1→ 2_2^+) > 0.00030 W.u., (p,t)
3_2^-	2434	<1.0 ps	log ft = 6.71 (β^+ from 3^+)
6_1^+	2467	1.6 ps	B(E2→ 4_1^+) = 50 W.u.
5_1^-	2843		(p,t)
3_3^-	2929		(p,t)
5_2^-	3173	<1.0 ps	
5_3^-	3350	<1.0 ps	(p,t)
8_1^+	3425	0.54 ps	B(E2→ 6_1^+) = 73 W.u.
2_4^+	3450		(p,t)
6_1^-	3522	2.9 ps	
4_2^+	3762		(p,t)
7_1^-	3770	2.8 ps	
7_2^-	3917	1.2 ps	
6_2^+	4310		(p,t)
10_1^+	4504	0.22 ps	B(E2→ 8_1^+) = 99 W.u.
12_1^+	5710	0.13 ps	B(E2→ 10_1^+) = 96 W.u.

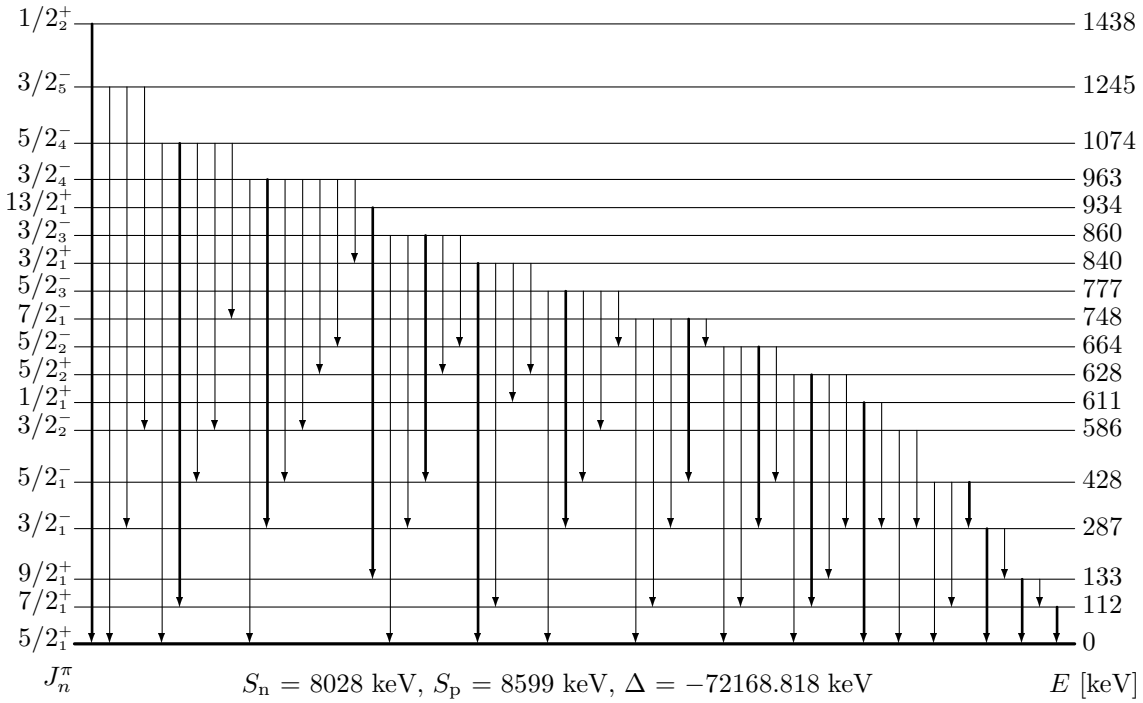

21/2$_1^-$ 3443
19/2$_1^-$ 3101
17/2$_1^-$ 2436
13/2$_2^-$ 2091
13/2$_3^+$ 2042
17/2$_1^+$ 2018
15/2$_1^-$ 2005
11/2$_2^-$ 1884
15/2$_1^+$ 1864
13/2$_2^+$ 1574
13/2$_1^-$ 1554
9/2$_2^-$ 1357
11/2$_1^-$ 1181
11/2$_2^+$ 1000
13/2$_1^+$ 973
11/2$_1^+$ 943
9/2$_1^-$ 805
5/2$_4^-$ 791
7/2$_2^+$ 725
5/2$_3^-$ 685
9/2$_2^+$ 639
5/2$_2^+$ 575
7/2$_1^-$ 506
5/2$_2^-$ 400
7/2$_1^+$ 295
5/2$_1^+$ 192
5/2$_1^-$ 151
3/2$_1^-$ 26
9/2$_1^+$ 0
J_n^π
S_n = 8390 keV, S_p = 7276 keV, Δ = −68216.276 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93K2, 98B]
$9/2_1^+$	0	7.15 h	$\mu = 0.87\ \mu_n$
$3/2_1^-$	26	39.8 m	B(E3→ $9/2_1^+$) = 0.0285 W.u., log ft = 5.70 (β^+ from $1/2^-$)
$5/2_1^-$	151	222 ps	B(M1→ $3/2_1^-$) = 0.046 W.u.
$5/2_1^+$	192	0.97 ns	B(E2→ $9/2_1^+$) = 22 W.u.
$7/2_1^+$	295		
$5/2_2^-$	400		
$7/2_1^-$	506	4.7 ps	B(M1/E2→ $5/2_1^-$) = 0.092/1.5 · 10^2 W.u. ($\delta = -0.38$), B(E2→ $3/2_1^-$) = 94 W.u.
$5/2_2^+$	575		
$9/2_2^+$	639		
$5/2_3^-$	685		
$7/2_2^+$	725		
$5/2_4^-$	791		
$9/2_1^-$	805	3.2 ps	B(M1/E2→ $7/2_1^-$) = 0.098/68 W.u. ($\delta = -0.21$), B(E2→ $5/2_2^-$) = 26 W.u., B(E2→ $5/2_1^-$) = 47 W.u.
$11/2_1^+$	943	0.97 ps	B(M1→ $9/2_2^+$) = 0.10 W.u., B(M1/E2→ $9/2_1^+$) = 0.0041/32 W.u. ($\delta = 2.2$)
$13/2_1^+$	973	0.87 ps	B(E2→ $9/2_1^+$) = 41.3 W.u.
$11/2_2^+$	1000		
$11/2_1^-$	1181	1.52 ps	B(M1/E2→ $9/2_1^-$) = 0.088/6 W.u. ($\delta = 0.082$), B(E2→ $7/2_1^-$) = 99 W.u.
$9/2_2^-$	1357		
$13/2_1^-$	1554	1.28 ps	B(M1/E2→ $11/2_1^-$) = 0.092/27 W.u. ($\delta = -0.17$), B(E2→ $9/2_1^-$) = 74 W.u.
$13/2_2^+$	1574		
$15/2_1^+$	1864	0.14 ps	B(M1/E2→ $13/2_1^+$) = 0.10/13 W.u. ($\delta = -0.27$)
$11/2_2^-$	1884		
$15/2_1^-$	2005	0.49 ps	B(M1/E2→ $13/2_1^-$) = 0.13/51 W.u. ($\delta = -0.24$), B(E2→ $11/2_1^-$) = 1.2 · 10^2 W.u.
$17/2_1^+$	2018	0.31 ps	B(E2→ $13/2_1^+$) = 81 W.u.
$13/2_3^+$	2042		
$13/2_2^-$	2091		
$17/2_1^-$	2436	0.28 ps	B(M1/E2→ $15/2_1^-$) = 0.20/4. · 10^1 W.u. ($\delta = -0.16$), B(E2→ $13/2_1^-$) = 1.7 · 10^2 W.u.
$19/2_1^-$	3101		
$21/2_1^-$	3443	0.21 ps	B(E2→ $17/2_1^-$) = 1.2 · 10^2 W.u.

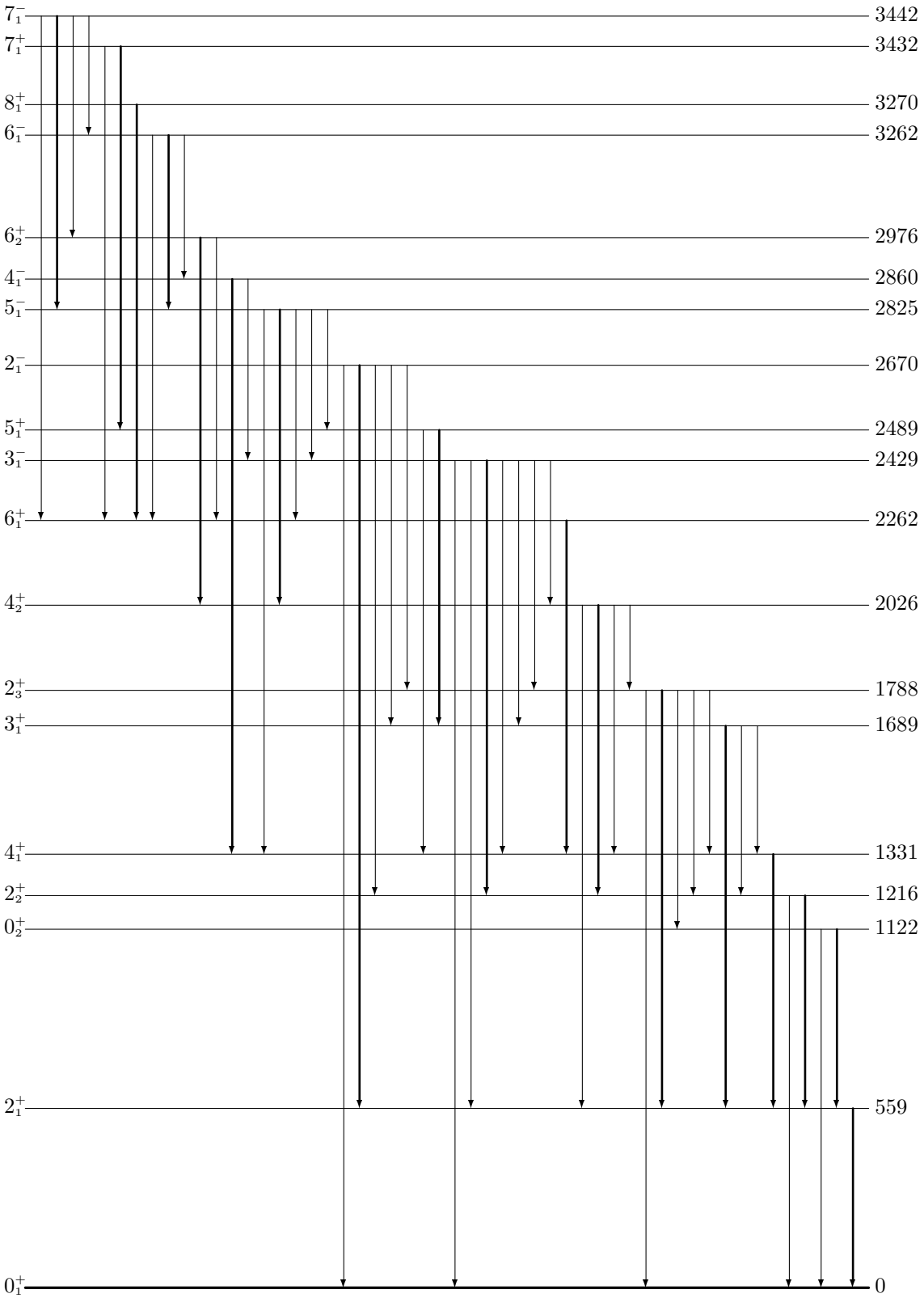


J_n^π $S_\mathrm{n} = 12068$ keV, $S_\mathrm{p} = 8545$ keV, $\Delta = -72212.607$ keV E [keV]

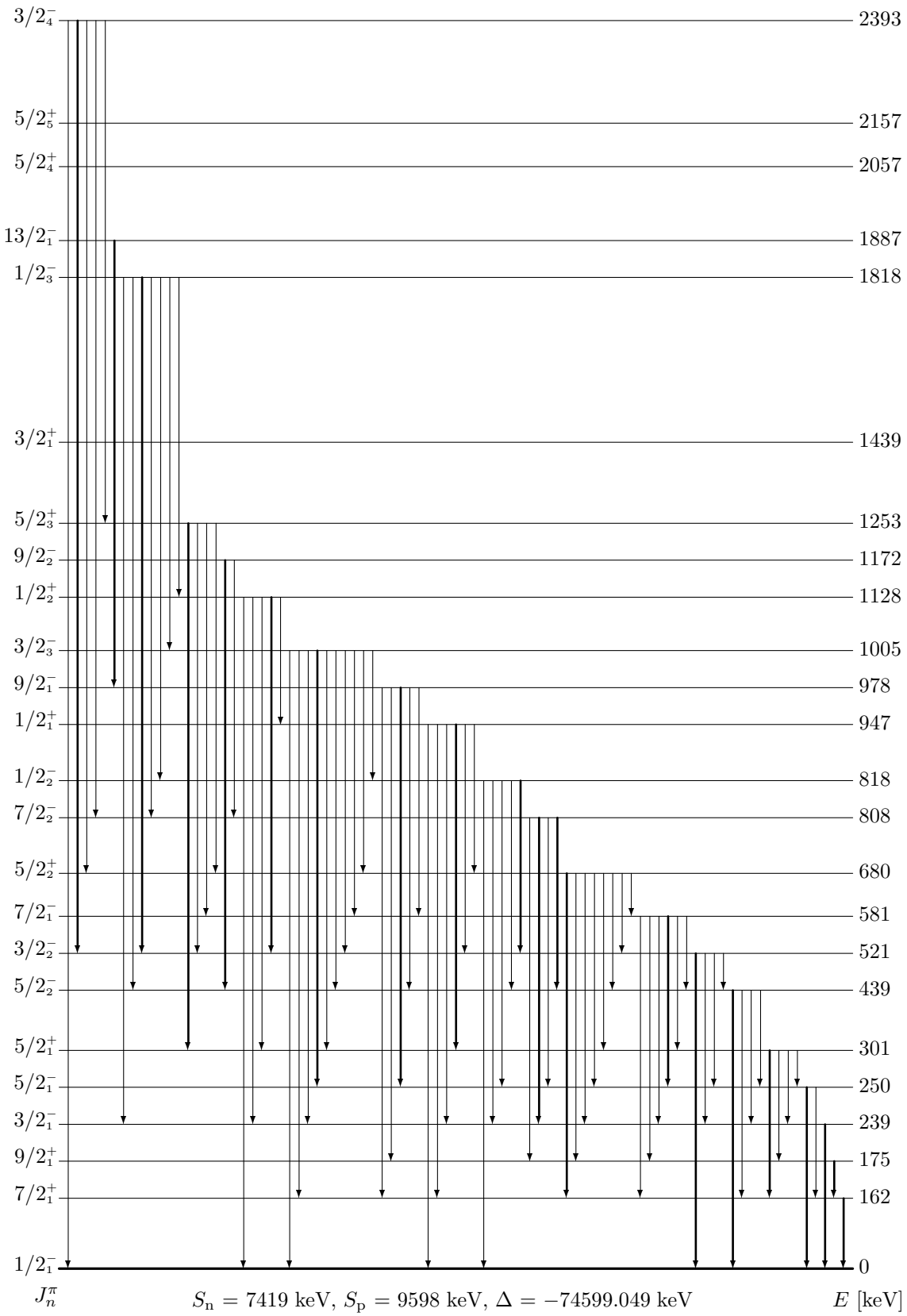
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95F, 98B]
0_1^+	0	stable	log ft = 9.38 (β^- from 2^-), (γ,γ'), (p,p′), (p,t), (^{3}He,n)
2_1^+	635	7.08 ps	B(E2→ 0_1^+) = 42.0 W.u., log ft = 7.63 (β^- from 2^-), log ft = 8.10 (β^+ from (0^-)), log ft = 9.70 (β^+ from $4^{(+)}$), Q = −0.36 barn, (γ,γ'), (p,p′), (p,t)
0_2^+	854	0.75 ns	B(E2→ 2_1^+) = 77 W.u., log ft = 8.02 (β^+ from (0^-)), (γ,γ'), (p,p′), (p,t)
2_2^+	1269	4.0 ps	B(M1/E2→ 2_1^+) = 0.0004/48 W.u. (δ = −5.6), B(E2→ 0_1^+) = 0.79 W.u., log ft = 7.10 (β^- from 2^-), log ft = 7.61 (β^+ from (0^-)), log ft = 9.50 (β^+ from $4^{(+)}$), (γ,γ'), (p,p′), (p,t)
4_1^+	1363	1.86 ps	B(E2→ 2_1^+) = 80 W.u., log ft = 7.74 (β^+ from $4^{(+)}$), (γ,γ'), (p,p′), (p,t)
3_1^+	1884	1.5 ps	B(E2→ 2_2^+) = $1.1 \cdot 10^2$ W.u., log ft = 8.50 (β^+ from (0^-)), log ft = 7.58 (β^+ from $4^{(+)}$)
4_2^+	2108	1.9 ps	B(M1/E2→ 4_1^+) < 0.0069/ < 17 W.u., B(E2→ 2_2^+) = 26 W.u., B(E2→ 2_1^+) = 0.39 W.u., log ft = 7.60 (β^+ from $4^{(+)}$), (p,t)
6_1^+	2231	0.86 ps	B(E2→ 4_1^+) = 72 W.u., log ft = 9.95 (β^+ from $4^{(+)}$)
3_1^-	2350	23 ps	B(E1→ 4_1^+) = $6.5 \cdot 10^{-6}$ W.u., B(E1→ 2_2^+) = $3.4 \cdot 10^{-6}$ W.u., B(E1→ 2_1^+) = $1.23 \cdot 10^{-6}$ W.u., log ft = 7.60 (β^+ from $4^{(+)}$), (γ,γ'), (p,p′), (p,t)
0_3^+	2718		(p,t)
5_1^-	2843	7.3 ps	B(E2→ 3_1^-) = 59 W.u., B(E1→ 6_1^+) = $2.7 \cdot 10^{-5}$ W.u., B(E1→ 4_2^+) = $4.1 \cdot 10^{-5}$ W.u., B(E1→ 4_1^+) = $2.6 \cdot 10^{-6}$ W.u.
3_2^-	2844		(p,p′), (p,t)
4_3^+	2903		(p,p′)
8_1^+	3198	0.42 ps	B(E2→ 6_1^+) = 86 W.u.
7_1^-	3516	3.5 ps	B(E2→ 5_1^-) = 54 W.u.
5_2^-	3529		(p,p′)
5_3^-	3602		(p,p′)
3_3^-	3845		(p,p′)
2_3^+	4005		(p,p′), (p,t)
10_1^+	4256	0.28 ps	B(E2→ 8_1^+) = 83 W.u.
4_4^+	4279		(p,p′)
9_1^-	4403	0.58 ps	B(E2→ 7_1^-) = 96 W.u.
3_4^-	4677		(p,p′)
12_1^+	5443	0.140 ps	B(E2→ 10_1^+) = 100 W.u.
11_1^-	5491	0.23 ps	
13_1^-	6686	0.22 ps	
14_1^+	6735	0.148 ps	B(E2→ 12_1^+) = 61 W.u.
16_1^+	8116	0.12 ps	B(E2→ 14_1^+) = 51 W.u.



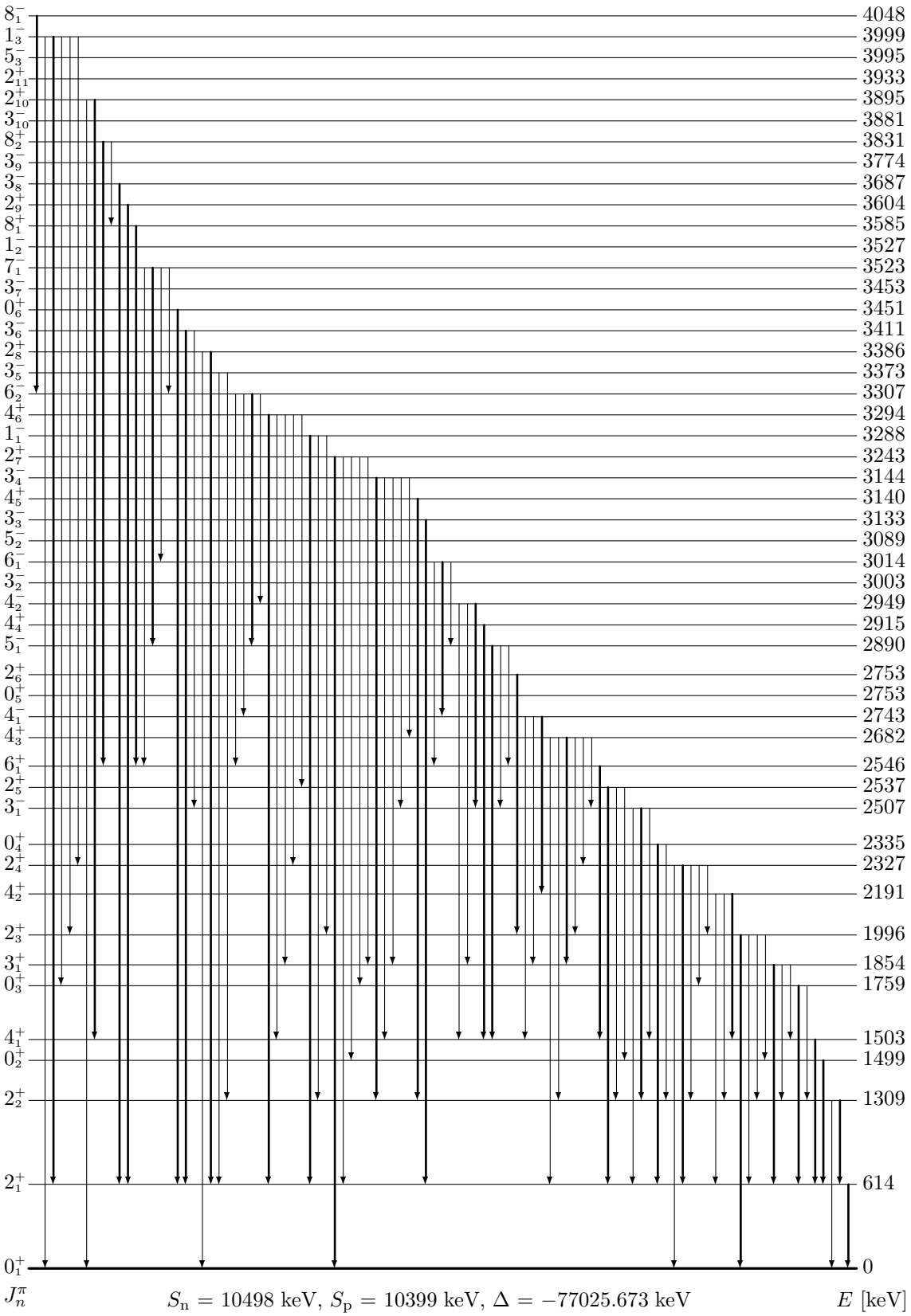
J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [90F, 98B]
$5/2^+_1$	0	119.79 d	log $ft = 6.30$ (β^+ from $3/2^-$), $Q = 1.1$ barn, $\mu = 0.67\ \mu_n$
$7/2^+_1$	112	0.69 ns	B(E2/M1→ $5/2^+_1$) = 217/0.0180 W.u. ($\delta = -0.33$), (d,t)
$9/2^+_1$	133	5.3 ns	(p,d), (d,p), (d,t)
$3/2^-_1$	287	1.29 ns	B(E1→ $5/2^+_1$) $= 1.23 \cdot 10^{-5}$ W.u., log $ft = 5.34$ (β^+ from $3/2^-$), (p,d), (d,t)
$5/2^-_1$	428		log $ft = 6.21$ (β^+ from $3/2^-$), (p,d), (d,p), (d,t)
$3/2^-_2$	586		log $ft = 6.61$ (β^+ from $3/2^-$), (p,d), (d,p), (d,t)
$1/2^+_1$	611		(d,p), (d,t)
$5/2^+_2$	628		(p,d), (d,p), (d,t)
$5/2^-_2$	664		log $ft = 6.07$ (β^+ from $3/2^-$), (p,d), (d,p), (d,t)
$7/2^-_1$	748		log $ft = 7.80$ (β^+ from $3/2^-$), (d,t)
$5/2^-_3$	777		log $ft = 6.75$ (β^+ from $3/2^-$), (p,d), (d,p), (d,t)
$3/2^+_1$	840		
$3/2^-_3$	860		log $ft = 5.75$ (β^+ from $3/2^-$), (p,d), (d,p), (d,t)
$13/2^+_1$	934		
$3/2^-_4$	963		log $ft = 7.32$ (β^+ from $3/2^-$), (p,d), (d,p), (d,t)
$5/2^-_4$	1074		log $ft = 6.28$ (β^+ from $3/2^-$), (d,t)
$3/2^-_5$	1245		log $ft = 5.72$ (β^+ from $3/2^-$), (p,d), (d,p), (d,t)
$1/2^+_2$	1438		(d,p)
$1/2^+_3$	1784		(d,p)
$1/2^+_4$	2565		(d,p)
$1/2^+_5$	2632		(d,p)
$1/2^+_6$	2824		(d,p)
$1/2^+_7$	3290		(p,d), (d,p)


7_1^- 3442
7_1^+ 3432
8_1^+ 3270
6_1^- 3262
6_2^+ 2976
4_1^- 2860
5_1^- 2825
2_1^- 2670
5_1^+ 2489
3_1^- 2429
6_1^+ 2262
4_2^+ 2026
2_3^+ 1788
3_1^+ 1689
4_1^+ 1331
2_2^+ 1216
0_2^+ 1122
2_1^+ 559
0_1^+ 0
J_n^π
$S_n = 11154$ keV, $S_p = 9508$ keV, $\Delta = -75251.563$ keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95S, 98B]
0_1^+	0	stable	log $ft = 9.74$ (β^- from 2^-), log $ft = 8.90$ (β^+ from 1^-)
2_1^+	559	12.3 ps	B(E2$\rightarrow 0_1^+$) = 44 W.u., log $ft = 8.12$ (β^- from 2^-), log $ft = 7.97$ (β^+ from 1^-), $Q = -0.34$ barn, $\mu = 0.80\ \mu_n$, (γ,γ'), Coul. ex., (p,p′), (d,d′), (α,α'), (d,t), (p,t)
0_2^+	1122	11 ps	B(E2$\rightarrow 2_1^+$) = 47 W.u., log $ft = 10.30$ (β^- from 2^-), log $ft = 8.70$ (β^+ from 1^-), (γ,γ'), (p,p′), (d,d′), (d,t), (p,t)
2_2^+	1216	3.4 ps	B(E2/M1$\rightarrow 2_1^+$) = $43/5.1 \cdot 10^{-4}$ W.u. ($\delta = 5.2$), B(E2$\rightarrow 0_1^+$) = 1.21 W.u., log $ft = 8.22$ (β^- from 2^-), log $ft = 8.50$ (β^+ from 1^-), (γ,γ'), Coul. ex., (p,p′), (d,d′), (α,α'), (d,t), (p,t)
4_1^+	1331	1.52 ps	B(E2$\rightarrow 2_1^+$) = 71 W.u., log $ft = 11.18$ (β^- from 2^-), log $ft = 4.60$ (β^+ from (4^+)), (γ,γ'), (p,p′), (d,d′), (d,t), (p,t)
3_1^+	1689	3.2 ps	B(E2/M1$\rightarrow 2_1^+$) = 1.9/0.0016 W.u. ($\delta = 1.08$), log $ft = 9.90$ (β^- from 2^-), log $ft = 9.91$ (β^+ from 1^-), (γ,γ'), (p,p′), (d,t)
2_3^+	1788	6 ps	B(E2/M1$\rightarrow 2_1^+$) = 0.2/0.0009 W.u. ($\delta = -0.51$), log $ft = 8.17$ (β^- from 2^-), log $ft = 8.50$ (β^+ from 1^-), (γ,γ'), (p,p′), (d,d′), (α,α'), (d,t)
4_2^+	2026	1.8 ps	B(E2/M1$\rightarrow 4_1^+$) = 22/0.003 W.u. ($\delta = 1.7$), B(E2$\rightarrow 2_2^+$) = 29 W.u., log $ft = 11.00$ (β^- from 2^-), (γ,γ'), (p,p′), (d,d′), (d,t), (p,t)
6_1^+	2262	0.62 ps	B(E2$\rightarrow 4_1^+$) = 68 W.u., (p,p′), (d,d′)
3_1^-	2429	14 ps	log $ft = 6.94$ (β^- from 2^-), log $ft = 7.84$ (β^+ from 1^-), (γ,γ'), (p,p′), (d,d′), (α,α'), (p,t)
5_1^+	2489	0.9 ps	B(E2$\rightarrow 3_1^+$) = 67 W.u., B(E2/M1$\rightarrow 4_1^+$) = 4.7/0.0006 W.u. ($\delta = 2.9$), (p,p′)
2_1^-	2670		log $ft = 6.56$ (β^- from 2^-), log $ft = 7.40$ (β^+ from 1^-), (d,d′), (p,t)
5_1^-	2825	6.2 ps	B(E2$\rightarrow 3_1^-$) = 90 W.u., B(E1$\rightarrow 4_1^+$) = $4.9 \cdot 10^{-6}$ W.u.
4_1^-	2860	1.2 ps	B(E2/M1$\rightarrow 3_1^-$) = 200/0.06 W.u. ($\delta = -0.7$), (d,t)
6_2^+	2976	1.2 ps	B(E2$\rightarrow 4_2^+$) = 29 W.u., (d,d′)
6_1^-	3262	12 ps	B(E2$\rightarrow 4_1^-$) = 37 W.u., B(E2/M1$\rightarrow 5_1^-$) = 5/0.012 W.u. ($\delta = -0.25$)
8_1^+	3270	0.35 ps	B(E2$\rightarrow 6_1^+$) = 82 W.u.
7_1^+	3432	0.8 ps	B(E2$\rightarrow 5_1^+$) = 40 W.u., B(E2/M1$\rightarrow 6_1^+$) < 0.1/0.0033 W.u. ($\delta = 0.08$)
7_1^-	3442	3.6 ps	B(E2$\rightarrow 5_1^-$) = 74 W.u.


3/2$_4^-$ 2393
5/2$_5^+$ 2157
5/2$_4^+$ 2057
13/2$_1^-$ 1887
1/2$_3^-$ 1818
3/2$_1^+$ 1439
5/2$_3^+$ 1253
9/2$_2^-$ 1172
1/2$_2^+$ 1128
3/2$_3^-$ 1005
9/2$_1^-$ 978
1/2$_1^+$ 947
1/2$_2^-$ 818
7/2$_2^-$ 808
5/2$_2^+$ 680
7/2$_1^-$ 581
3/2$_2^-$ 521
5/2$_2^-$ 439
5/2$_1^+$ 301
5/2$_1^-$ 250
3/2$_1^-$ 239
9/2$_1^+$ 175
7/2$_1^+$ 162
1/2$_1^-$ 0
J_n^π
S_n = 7419 keV, S_p = 9598 keV, Δ = −74599.049 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [97F, 98B]
$1/2_1^-$	0	stable	log $ft = 5.71$ (β^- from $3/2^-$), log $ft = 5.73$ (β^+ from $3/2^-$), $\mu = 0.5350422\ \mu_n$
$7/2_1^+$	162	17.36 s	B(E3$\rightarrow 1/2_1^-$) = 0.0362 W.u., log $ft = 8.43$ (β^- from $3/2^-$), log $ft = 8.90$ (β^+ from $3/2^-$), Coul. ex., (d,d′)
$9/2_1^+$	175		(p,d), (d,p), (d,t)
$3/2_1^-$	239	18 ps	B(M1/E2$\rightarrow 1/2_1^-$) = 0.087/46 W.u. ($\delta = 0.152$), log $ft = 6.84$ (β^- from $3/2^-$), log $ft = 6.02$ (β^+ from $3/2^-$), Coul. ex., (d,p)
$5/2_1^-$	250	9.68 ns	B(E1$\rightarrow 7/2_1^+$) = $1.73 \cdot 10^{-5}$ W.u., B(E2$\rightarrow 1/2_1^-$) = 1.98 W.u., log $ft = 7.21$ (β^- from $3/2^-$), log $ft = 7.47$ (β^+ from $3/2^-$), (d,t), $Q = 1.1$ barn, $\mu = 1.118\ \mu_n$, (γ,γ'), Coul. ex., (d,d′), (p,d), (d,p)
$5/2_1^+$	301		log $ft = 8.71$ (β^- from $3/2^-$), log $ft = 8.38$ (β^+ from $3/2^-$), (p,d), (d,p), (d,t)
$5/2_2^-$	439	23.0 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.051/14 W.u. ($\delta = 0.09$), B(E1$\rightarrow 7/2_1^+$) = $5.3 \cdot 10^{-6}$ W.u., B(E2$\rightarrow 1/2_1^-$) = 42.2 W.u., log $ft = 8.94$ (β^- from $3/2^-$), log $ft = 6.87$ (β^+ from $3/2^-$), $\mu = 1.02\ \mu_n$, (γ,γ'), Coul. ex., (d,d′), (p,d), (d,p), (d,t)
$3/2_2^-$	521	4 ps	B(M1/E2$\rightarrow 5/2_1^-$) = 0.0033/5.3 W.u. ($\delta = -0.30$), B(M1/E2$\rightarrow 3/2_1^-$) = 0.022/5.2 W.u. ($\delta = 0.12$), B(M1/E2$\rightarrow 1/2_1^-$) = 0.034/4.8 W.u. ($\delta = 0.17$), log $ft = 5.81$ (β^- from $3/2^-$), log $ft = 5.68$ (β^+ from $3/2^-$), (γ,γ'), Coul. ex., (d,d′), (p,d), (d,p)
$7/2_1^-$	581	34 ps	B(M1$\rightarrow 5/2_2^-$) = 0.0060 W.u., B(E1$\rightarrow 5/2_1^+$) = $5.5 \cdot 10^{-6}$ W.u., B(M1/E2$\rightarrow 5/2_1^-$) = 0.0061/74 W.u. ($\delta = 1.00$), B(E2$\rightarrow 3/2_1^-$) = 13.2 W.u., B(E1$\rightarrow 9/2_1^+$) = $9.3 \cdot 10^{-6}$ W.u., B(E1$\rightarrow 7/2_1^+$) = $2.1 \cdot 10^{-5}$ W.u., log $ft = 8.29$ (β^+ from $3/2^-$)
$5/2_2^+$	680		log $ft = 7.82$ (β^+ from $3/2^-$), (p,d), (d,p), (d,t)
$7/2_2^-$	808	0.31 ps	B(M1/E2$\rightarrow 5/2_2^-$) = 0.91/147 W.u. ($\delta = 0.13$)
$1/2_2^-$	818		log $ft = 5.57$ (β^+ from $3/2^-$), (p,d), (d,p)
$1/2_1^+$	947		(γ,γ'), (d,p)
$9/2_1^-$	978	0.69 ps	B(E2$\rightarrow 5/2_2^-$) = $9. \cdot 10^1$ W.u., B(E2$\rightarrow 5/2_1^-$) = $1.3 \cdot 10^2$ W.u., B(E1$\rightarrow 9/2_1^+$) = $9. \cdot 10^{-5}$ W.u., B(E1$\rightarrow 7/2_1^+$) = $8. \cdot 10^{-5}$ W.u., (d,d′)
$3/2_3^-$	1005	0.14 ps	B(E1$\rightarrow 5/2_2^+$) = 0.0004 W.u., B(E2$\rightarrow 7/2_1^-$) = 70 W.u., B(M1/E2$\rightarrow 3/2_2^-$) = 0.28/116 W.u. ($\delta = 0.27$), B(M1/E2$\rightarrow 5/2_1^-$) = 0.12/26 W.u. ($\delta = 0.30$), B(E1$\rightarrow 5/2_1^+$) = $3.1 \cdot 10^{-5}$ W.u., B(M2$\rightarrow 7/2_1^+$) = 115 W.u., B(M1$\rightarrow 1/2_1^-$) = 0.032 W.u., log $ft = 5.55$ (β^+ from $3/2^-$), (γ,γ'), (p,d), (d,p)
$1/2_2^+$	1128		(d,p)
$9/2_2^-$	1172	0.38 ps	B(E2$\rightarrow 5/2_2^-$) = $3.0 \cdot 10^2$ W.u.
$5/2_3^+$	1253	0.62 ps	B(E1$\rightarrow 7/2_1^-$) = 0.00015 W.u., B(E1$\rightarrow 3/2_2^-$) = 0.00015 W.u., (d,p)
$3/2_1^+$	1439		(p,d), (d,p)
$1/2_3^-$	1818	0.055 ps	B(E1$\rightarrow 1/2_2^+$) = 0.00018 W.u., B(E2$\rightarrow 5/2_2^-$) = 15 W.u., (d,d′), (p,d), (d,p)
$13/2_1^-$	1887	0.49 ps	B(E2$\rightarrow 9/2_1^-$) = $9. \cdot 10^1$ W.u.
$5/2_4^+$	2057		(d,d′), (p,d), (d,p)
$5/2_5^+$	2157		(d,p)
$3/2_4^-$	2393	0.10 ps	B(E1$\rightarrow 5/2_3^+$) = 0.00018 W.u., B(E2$\rightarrow 7/2_2^-$) = 5 W.u., B(E1$\rightarrow 5/2_2^+$) = 0.00014 W.u., (d,p)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2^+_3 1996
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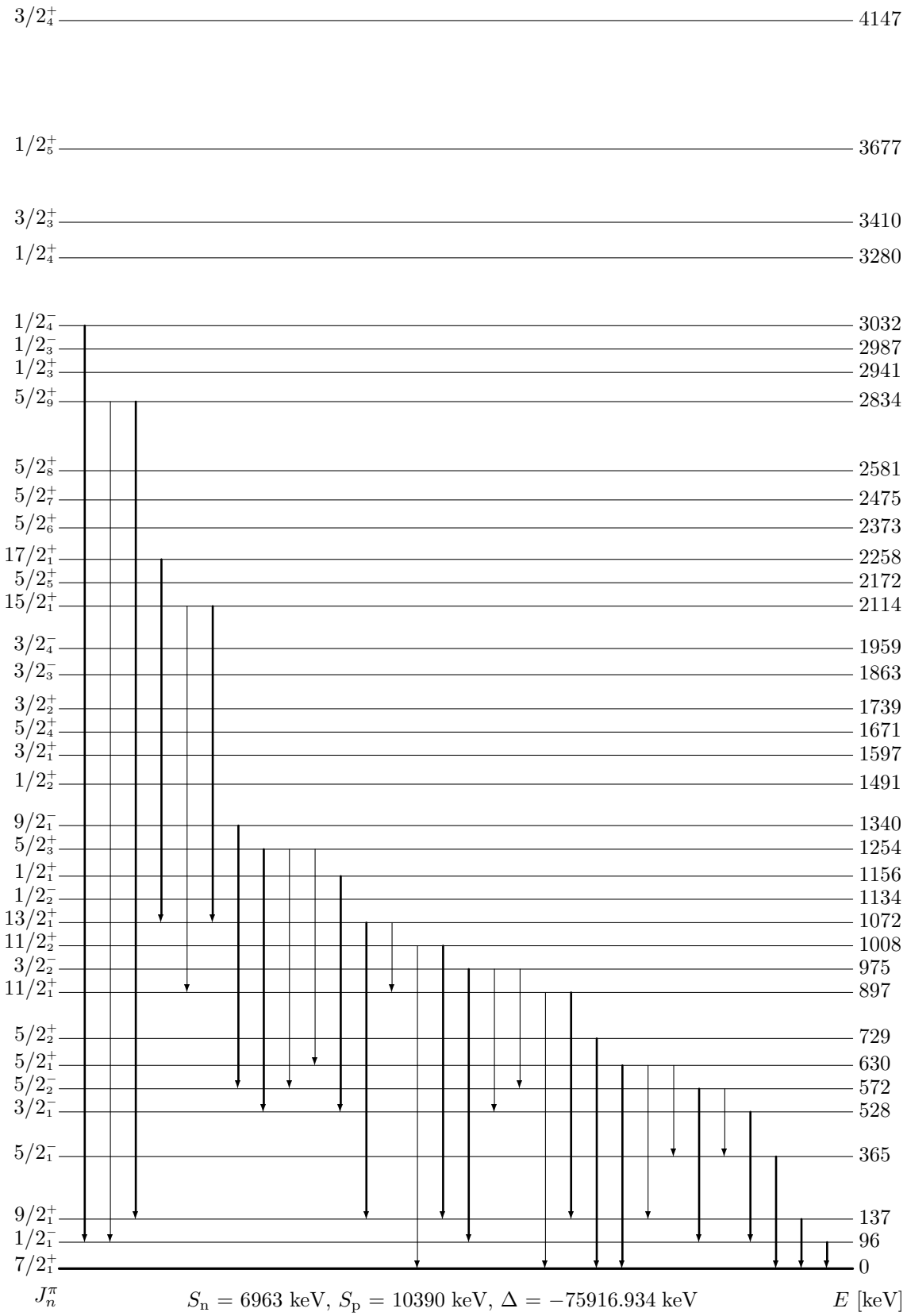
0^+_3 1759
4^+_1 1503
0^+_2 1499
2^+_2 1309
2^+_1 614
0^+_1 0
J^π_n
S_n = 10498 keV, S_p = 10399 keV, Δ = −77025.673 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [91R, 98B]
0_1^+	0	stable	log ft = 9.64 (β^- from (2^-)), log ft = 4.75 (β^+ from 1^+), Coul. ex., (p,p′), (d,d′), (d,p), (t,p)
2_1^+	614	9.7 ps	B(E2→ 0_1^+) = 40 W.u., log ft = 7.91 (β^- from (2^-)), log ft = 5.07 (β^+ from 1^+)
2_2^+	1309	4.2 ps	log ft = 7.61 (β^- from (2^-)), log ft = 6.62 (β^+ from 1^+)
0_2^+	1499	1.8 ps	log ft = 10.52 (β^- from (2^-)), log ft = 6.47 (β^+ from 1^+), Coul. ex., (p,p′), (d,p), (t,p)
4_1^+	1503	1.05 ps	B(E2→ 2_1^+) = 57 W.u., log ft = 10.26 (β^- from (2^-)), Coul. ex., (p,p′), (d,d′)
0_3^+	1759		log ft = 9.20 (β^- from (2^-)), log ft = 6.78 (β^+ from 1^+), (p,p′), (d,d′)
3_1^+	1854	1.2 ps	B(E2/M1→ 2_2^+) = 24/0.032 W.u. (δ = 0.42), B(E2/M1→ 2_1^+) = 0.7/0.005 W.u. (δ = −0.41), log ft = 8.20 (β^- from (2^-)), (p,p′), (d,p)
2_3^+	1996	4.6 ps	B(E2/M1→ 2_2^+) = 0.8/0.0035 W.u. (δ = −0.30), B(E2/M1→ 2_1^+) = 0.05/0.0040 W.u. (δ = 0.44), B(E2→ 0_2^+) = 10 W.u., B(E2→ 0_1^+) = 0.09 W.u., log ft = 8.30 (β^- from (2^-)), log ft = 6.93 (β^+ from 1^+), Coul. ex., (p,p′), (d,d′), (t,p)
4_2^+	2191	0.7 ps	B(M1→ 4_1^+) = 0.08 W.u., (p,p′), (d,d′)
2_4^+	2327	0.28 ps	B(E2→ 0_3^+) = 32 W.u., B(E2/M1→ 2_1^+) = 4.5/0.0034 W.u. (δ = −1.8), B(E2→ 0_1^+) = 0.11 W.u., log ft = 8.70 (β^- from (2^-)), log ft = 7.37 (β^+ from 1^+), (p,p′)
0_4^+	2335		log ft = 5.90 (β^+ from 1^+)
3_1^-	2507	6.2 ps	B(E1→ 2_2^+) = 2.5 · 10^{-5} W.u., log ft = 8.02 (β^- from (2^-)), Coul. ex., (p,p′), (t,p)
2_5^+	2537	0.055 ps	log ft = 8.28 (β^- from (2^-)), log ft = 5.61 (β^+ from 1^+), (p,p′), (t,p)
6_1^+	2546	0.49 ps	B(E2→ 4_1^+) = 4.3 W.u.
4_3^+	2682		log ft = 7.30 (β^- from (2^-)), (p,p′), (t,p)
4_1^-	2743	0.42 ns	B(E1→ 4_2^+) = 3.1 · 10^{-6} W.u., (p,p′)
0_5^+	2753		(t,p)
2_6^+	2753		
5_1^-	2890	18 ps	B(E1→ 6_1^+) = 6.6 · 10^{-5} W.u., B(E2→ 3_1^-) = 44 W.u., B(E1→ 4_1^+) = 6.7 · 10^{-6} W.u., (t,p)
4_4^+	2915	0.24 ns	(p,p′), (t,p)
4_2^-	2949	>1.4 ps	(p,p′), (d,p)
3_2^-	3003		(t,p)
6_1^-	3014	3.0 ns	B(M1→ 5_1^-) = 7 · 10^{-4} W.u., B(E2→ 4_1^-) = 4.0 W.u., B(E1→ 6_1^+) = 1.8 · 10^{-7} W.u., (t,p)
5_2^-	3089		(p,p′), (t,p)
3_3^-	3133		(t,p)
4_5^+	3140		(p,p′)
3_4^-	3144		log ft = 6.61 (β^- from (2^-)), (t,p)
2_7^+	3243		(p,p′)
1_1^-	3288		(t,p)
4_6^+	3294		log ft = 6.22 (β^- from (2^-)), (p,p′), (t,p)
6_2^-	3307	11 ps	B(E2→ 4_2^-) = 50 W.u., B(E2/M1→ 5_1^-) = 15/0.012 W.u. (δ = −0.4), B(E2→ 4_1^-) = 6.3 W.u., B(E1→ 6_1^+) = 1.7 · 10^{-5} W.u.
3_5^-	3373		log ft = 7.26 (β^- from (2^-)), (p,p′)
2_8^+	3386		(t,p)

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [91R, 98B]
3_6^-	3411		log ft = 7.08 (β^- from (2^-)), (p,p′), (t,p)
0_6^+	3451		(t,p)
3_7^-	3453		(p,p′), (d,p)
7_1^-	3523		
1_2^-	3527		(t,p)
8_1^+	3585	0.42 ps	B(E2→ 6_1^+) = 59 W.u.
2_9^+	3604		(p,p′)
3_8^-	3687		(p,p′), (d,p), (t,p)
3_9^-	3774		(p,p′), (t,p)
8_2^+	3831	0.55 ps	B(M1→ 8_1^+) = 0.5 W.u., B(E2→ 6_1^+) = 9 W.u.
3_{10}^-	3881		(p,p′)
2_{10}^+	3895		(t,p)
2_{11}^+	3933		(t,p)
5_3^-	3995		(p,p′)
1_3^-	3999		(t,p)
8_1^-	4048	0.9 ps	B(E2→ 6_2^-) = 142 W.u.
1_4^-	4106		(t,p)
8_3^+	4121		
4_7^+	4122		(p,p′), (t,p)
3_{11}^-	4155		(p,p′), (t,p)
0_7^+	4182		(t,p)
3_{12}^-	4224		(t,p)
0_8^+	4265		(t,p)
2_{12}^+	4297		(t,p)
3_{13}^-	4345		(t,p)
2_{13}^+	4409		(t,p)
4_8^+	4483		(t,p)
2_{14}^+	4509		(t,p)
4_9^+	4616		(t,p)
5_4^-	4622		(p,p′)
3_{14}^-	4639		(t,p)
2_{15}^+	4723		(t,p)
4_{10}^+	4758		(p,p′), (t,p)
0_9^+	4791		(t,p)
2_{16}^+	4812		(t,p)
1_5^-	4857		(t,p)
3_{15}^-	4879		(t,p)
3_{16}^-	4902		(p,p′), (d,p)
2_{17}^+	4904		(t,p)
2_{18}^+	4944		(t,p)
1_6^-	4972		(d,p), (t,p)
2_{19}^+	5030		(t,p)
3_{17}^-	5295		(p,p′), (t,p)
2_{20}^+	5610		(d,p)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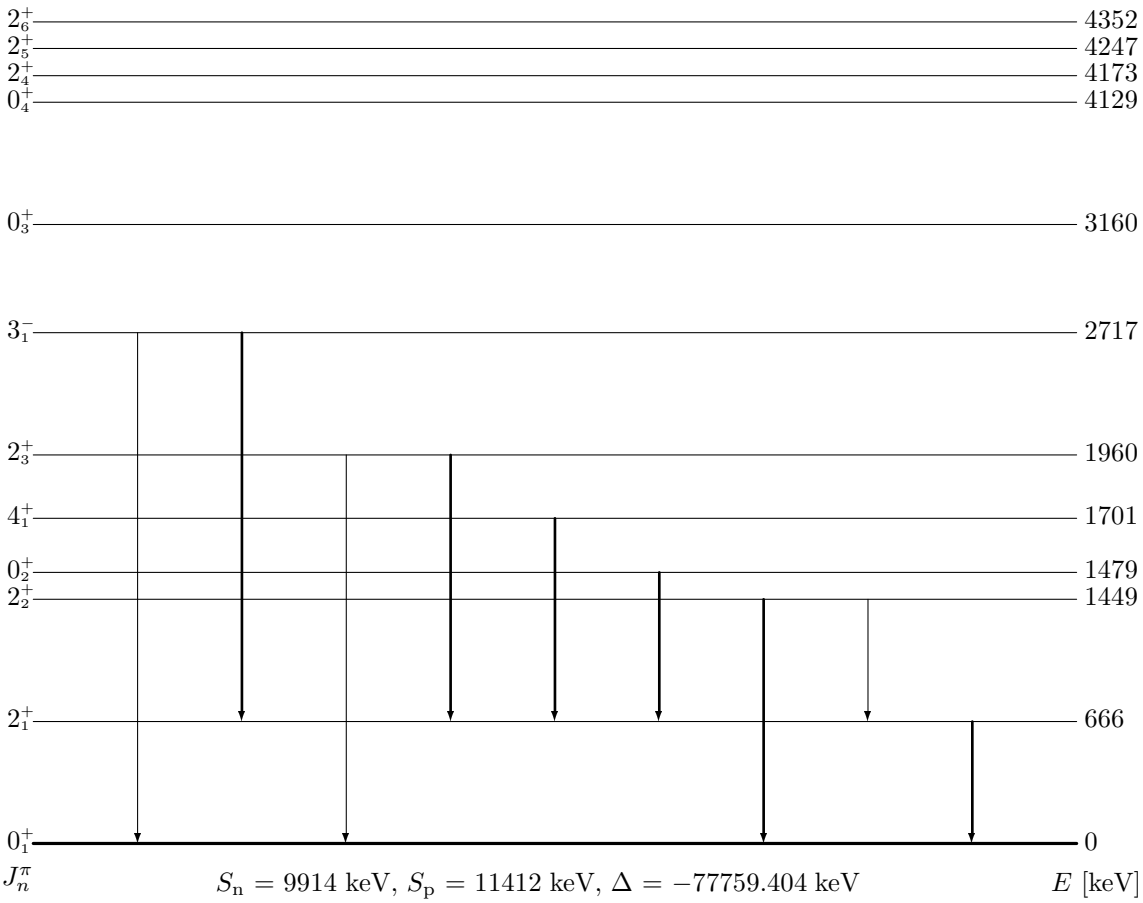
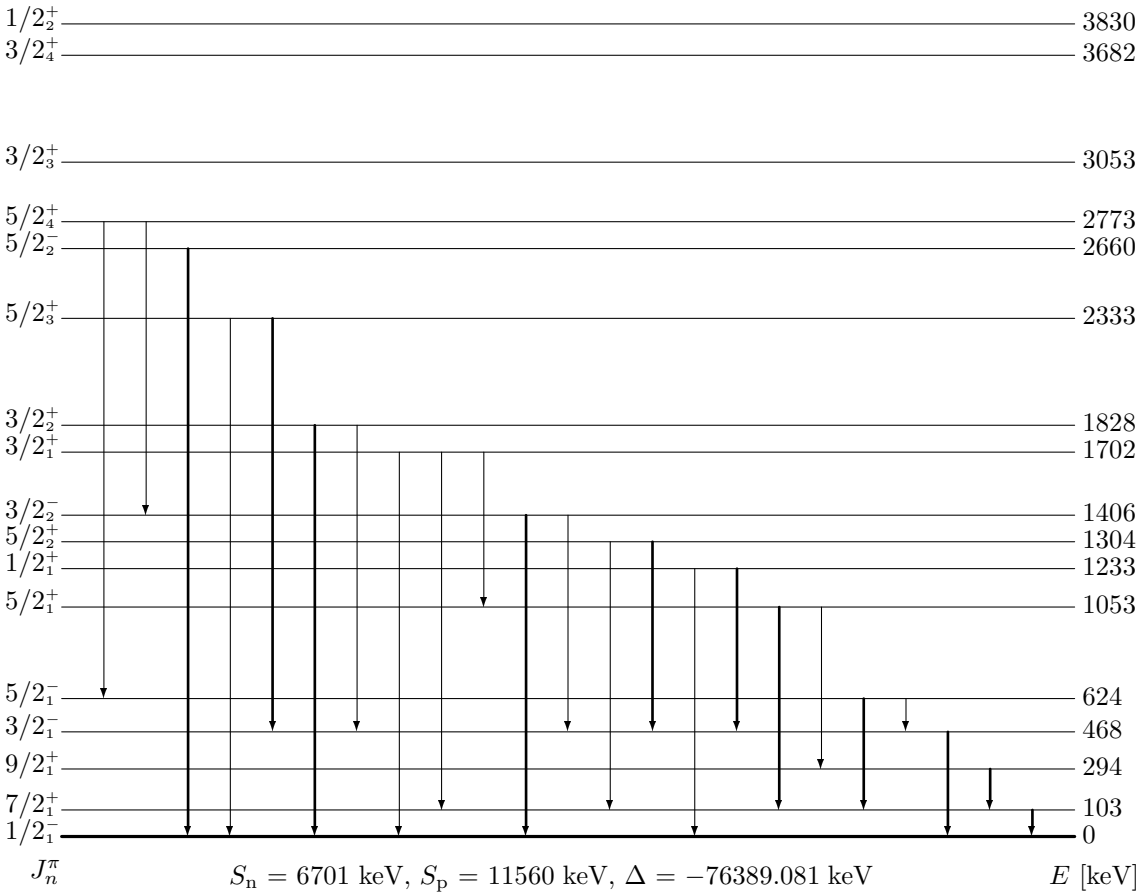
5/2+1 630
5/2−2 572
3/2−1 528
5/2−1 365
9/2+1 137
1/2−1 96
7/2+1 0
J^π_n
S_n = 6963 keV, S_p = 10390 keV, Δ = −75916.934 keV
E [keV]

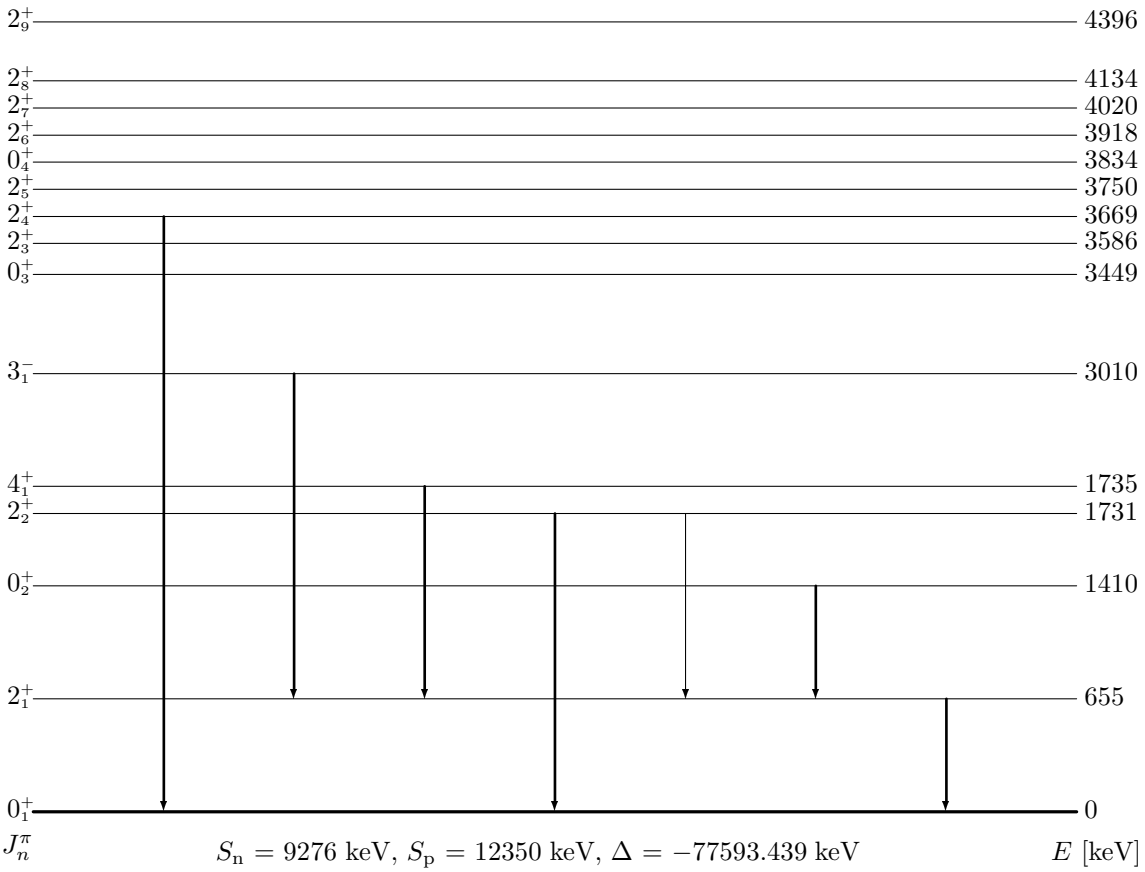
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93S, 98B]
$7/2_1^+$	0	$\leq 6.5 \cdot 10^5$ y	log $ft = 8.50$ (β^- from $3/2^-$), $Q = 0.8$ barn, $\mu = -1.018\ \mu_n$, (p,d)
$1/2_1^-$	96	3.92 m	B(E3$\rightarrow 7/2_1^+$) = 0.018 W.u., log $ft = 5.27$ (β^- from $3/2^-$), (p,d), (d,p), (d,t), (t,p)
$9/2_1^+$	137		(p,d), (d,p), (d,t), (t,p)
$5/2_1^-$	365	94 ps	log $ft = 6.85$ (β^- from $3/2^-$), (p,d), (d,p), (d,t), (t,p)
$3/2_1^-$	528	3.1 ps	log $ft = 6.82$ (β^- from $3/2^-$), (p,d), (d,p), (d,t)
$5/2_2^-$	572	16 ps	B(E2$\rightarrow 1/2_1^-$) = 68 W.u., log $ft = 7.40$ (β^- from $3/2^-$)
$5/2_1^+$	630		(p,d), (d,p), (d,t), (t,p)
$5/2_2^+$	729		(p,d), (d,p), (d,t)
$11/2_1^+$	897	0.62 ps	B(M1/E2$\rightarrow 9/2_1^+$) = 0.060/12 W.u. ($\delta = -0.3$), B(E2$\rightarrow 7/2_1^+$) = 15 W.u.
$3/2_2^-$	975		log $ft = 6.10$ (β^- from $3/2^-$), (p,d), (d,p), (d,t)
$11/2_2^+$	1008	1.2 ps	B(E2$\rightarrow 7/2_1^+$) = 6 W.u.
$13/2_1^+$	1072	0.83 ps	B(E2$\rightarrow 9/2_1^+$) = 46 W.u.
$1/2_2^-$	1134		(t,p)
$1/2_1^+$	1156		(p,d), (d,p)
$5/2_3^+$	1254	0.48 ps	(p,d), (d,p), (t,p)
$9/2_1^-$	1340	0.62 ps	B(E2$\rightarrow 5/2_2^-$) = 175 W.u.
$1/2_2^+$	1491		(d,p)
$3/2_1^+$	1597		(d,p)
$5/2_4^+$	1671		(p,d), (d,p)
$3/2_2^+$	1739		(p,d), (d,p), (t,p)
$3/2_3^-$	1863		(p,d), (d,p), (t,p)
$3/2_4^-$	1959		(p,d), (d,p), (t,p)
$15/2_1^+$	2114	0.42 ps	B(E2$\rightarrow 11/2_1^+$) = 7 W.u.
$5/2_5^+$	2172		(p,d), (d,p), (t,p)
$17/2_1^+$	2258	0.7 ps	B(E2$\rightarrow 13/2_1^+$) = 17 W.u.
$5/2_6^+$	2373		(d,p)
$5/2_7^+$	2475		(d,p)
$5/2_8^+$	2581		(d,p)
$5/2_9^+$	2834		(p,d), (d,p), (t,p)
$1/2_3^+$	2941		(d,p)
$1/2_3^-$	2987		(d,p), (t,p)
$1/2_4^-$	3032		(t,p)
$1/2_4^+$	3280		(d,p)
$3/2_3^+$	3410		(d,p)
$1/2_5^+$	3677		(d,p)
$3/2_4^+$	4147		(d,p)



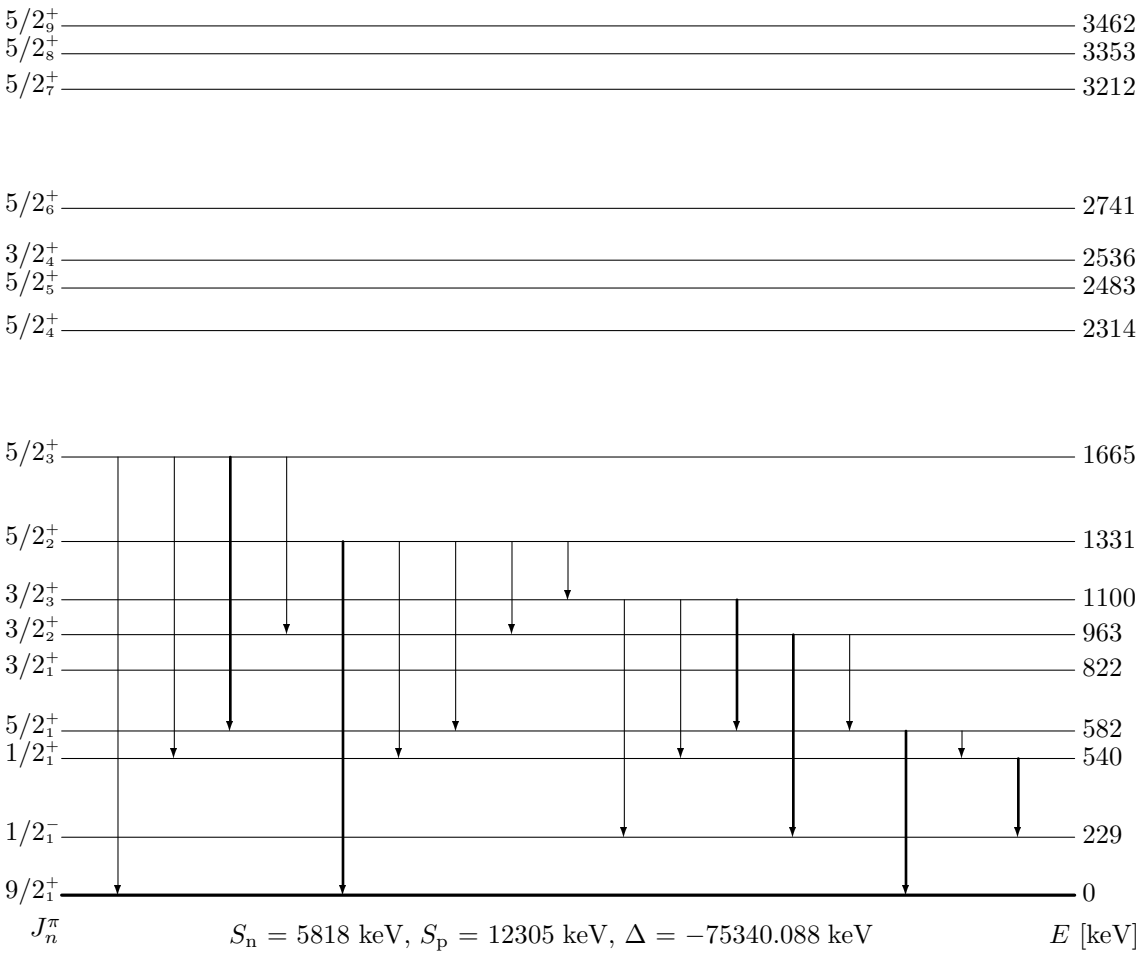
J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92S, 98B]
0^+_1	0	stable	log $ft = 5.70$ (β^- from $1^{(+)}$), log $ft = 4.67$ (β^+ from 1^+)
2^+_1	666	8.56 ps	B(E2$\rightarrow 0^+_1$) = 24.6 W.u., log $ft = 5.70$ (β^- from $1^{(+)}$), log $ft = 4.94$ (β^+ from 1^+), $Q = -0.31$ barn, $\mu = 0.84\ \mu_n$, (γ,γ'), Coul. ex., (p,p′), (d,d′), (α,α'), (p,t), (t,p)
2^+_2	1449	1.95 ps	B(E2/M1$\rightarrow 2^+_1$) = $19/4\cdot 10^{-4}$ W.u. ($\delta = -5$), B(E2$\rightarrow 0^+_1$) = 1.32 W.u., log $ft = 6.70$ (β^- from $1^{(+)}$), log $ft = 5.70$ (β^+ from 1^+), (γ,γ'), Coul. ex., (p,p′), (d,d′), (α,α'), (t,p)
0^+_2	1479	11.4 ps	B(E2$\rightarrow 2^+_1$) = 6.8 W.u., log $ft = 7.20$ (β^- from $1^{(+)}$), log $ft = 5.30$ (β^+ from 1^+), (γ,γ'), Coul. ex., (p,p′), (d,d′), (α,α')
4^+_1	1701	0.66 ps	B(E2$\rightarrow 2^+_1$) = 35.2 W.u., Coul. ex., (p,p′), (d,d′), (α,α')
2^+_3	1960	7 ps	B(E2$\rightarrow 0^+_1$) = 0.06 W.u., log $ft = 6.40$ (β^- from $1^{(+)}$), Coul. ex., (p,p′), (d,d′), (t,p)
3^-_1	2717	0.33 ps	Coul. ex., (p,p′), (d,d′), (t,p)
0^+_3	3160		(t,p)
0^+_4	4129		(t,p)
2^+_4	4173		(p,p′), (d,d′), (t,p)
2^+_5	4247		(t,p)
2^+_6	4352		(p,p′), (t,p)



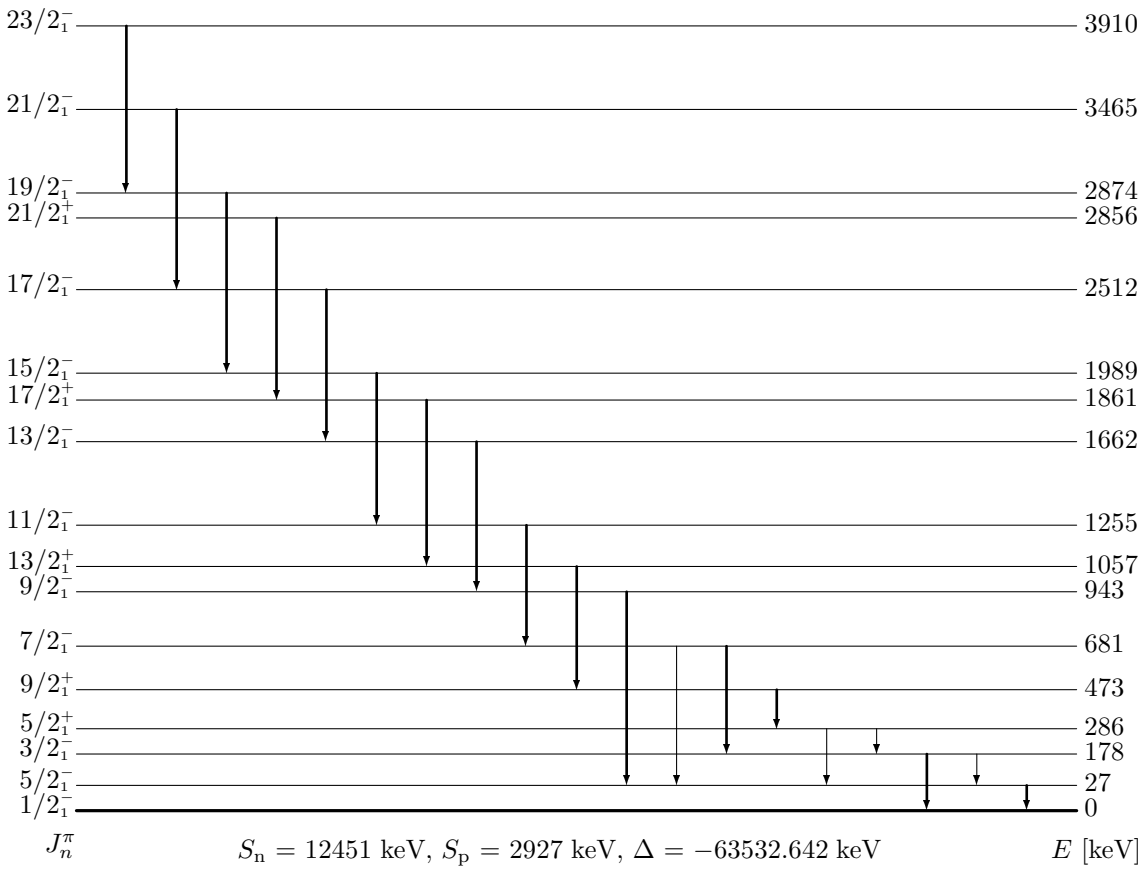
J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [96B, 98B]
$1/2^-_1$	0	18.45 m	log ft = 5.27 (β^- from $3/2^-$), (p,d), (d,p), (d,t)
$7/2^+_1$	103	57.28 m	B(E3/M4→ $1/2^-_1$) = $9.5 \cdot 10^{-4}$/ < 30 W.u. (δ = 0.0057), log ft = 8.50 (β^- from $3/2^-$), (p,d), (d,p)
$9/2^+_1$	294		(p,d), (d,p), (d,t)
$3/2^-_1$	468		log ft = 5.60 (β^- from $3/2^-$), (p,d), (d,p), (d,t)
$5/2^-_1$	624		log ft = 6.56 (β^- from $3/2^-$), (p,d), (d,p), (d,t)
$5/2^+_1$	1053		log ft = 6.94 (β^- from $3/2^-$), (p,d), (d,p), (d,t)
$1/2^+_1$	1233		(d,p)
$5/2^+_2$	1304		log ft = 7.02 (β^- from $3/2^-$), (p,d), (d,p), (d,t)
$3/2^-_2$	1406		log ft = 6.09 (β^- from $3/2^-$), (p,d), (d,p), (d,t)
$3/2^+_1$	1702		(d,p)
$3/2^+_2$	1828		(d,p)
$5/2^+_3$	2333		log ft = 6.00 (β^- from $3/2^-$)
$5/2^-_2$	2660		log ft = 5.80 (β^- from $3/2^-$), (p,d), (d,p)
$5/2^+_4$	2773		(p,d), (d,p)
$3/2^+_3$	3053		(p,d), (d,p)
$3/2^+_4$	3682		(d,p)
$1/2^+_2$	3830		(d,p)



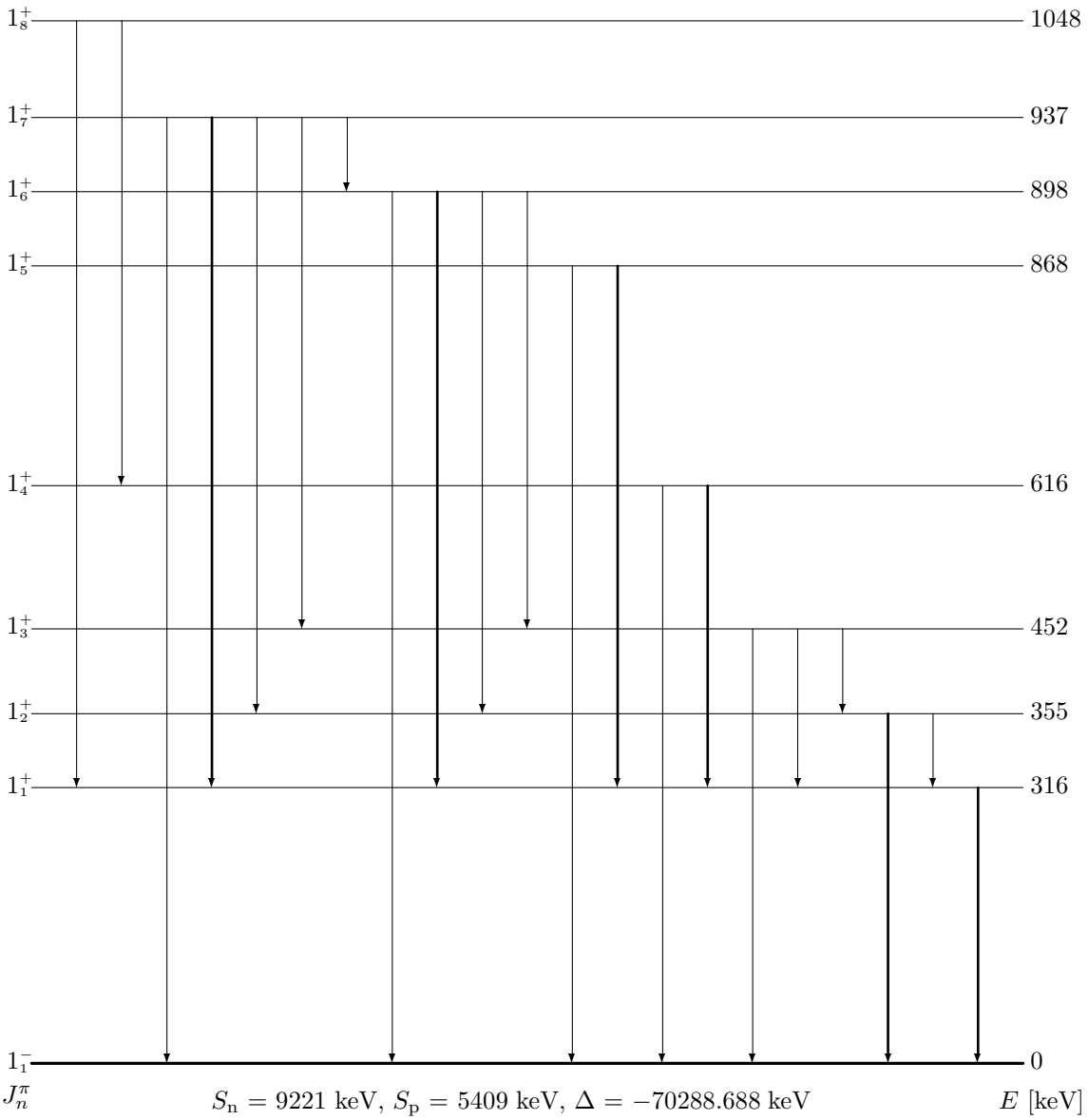
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95K, 98B]
0_1^+	0	$1.08{\cdot}10^{20}$ y	log $ft = 6.26$ (β^- from (1^+)), Coul. ex., (p,p′), (d,d′), (t,p)
2_1^+	655	13.1 ps	B(E2→ 0_1^+) = 17.0 W.u., log $ft = 6.98$ (β^- from (1^+)), $Q = -0.22$ barn, $\mu = 0.86\ \mu_n$, Coul. ex., (p,p′), (d,d′), (t,p)
0_2^+	1410	30 ps	B(E2→ 2_1^+) = 3.7 W.u., log ft = 7.49 (β^- from (1^+)), Coul. ex., (p,p′), (t,p)
2_2^+	1731	0.94 ps	B(E2→ 2_1^+) = 5.01 W.u., B(E2→ 0_1^+) = 1.37 W.u., log $ft = 7.06$ (β^- from (1^+)), Coul. ex., (p,p′), (d,d′)
4_1^+	1735	0.96 ps	B(E2→ 2_1^+) = 19 W.u., log $ft = 6.38$ (β^- from (5^-)), log $ft = 12.10$ (β^- from (1^+)), Coul. ex., (p,p′), (d,d′), (t,p)
3_1^-	3010		(p,p′), (t,p)
0_3^+	3449		(t,p)
2_3^+	3586		(p,p′), (t,p)
2_4^+	3669		log $ft = 6.81$ (β^- from (1^+)), (t,p)
2_5^+	3750		(p,p′), (t,p)
0_4^+	3834		(t,p)
2_6^+	3918		(p,p′), (t,p)
2_7^+	4020		(p,p′), (t,p)
2_8^+	4134		(t,p)
2_9^+	4396		(t,p)



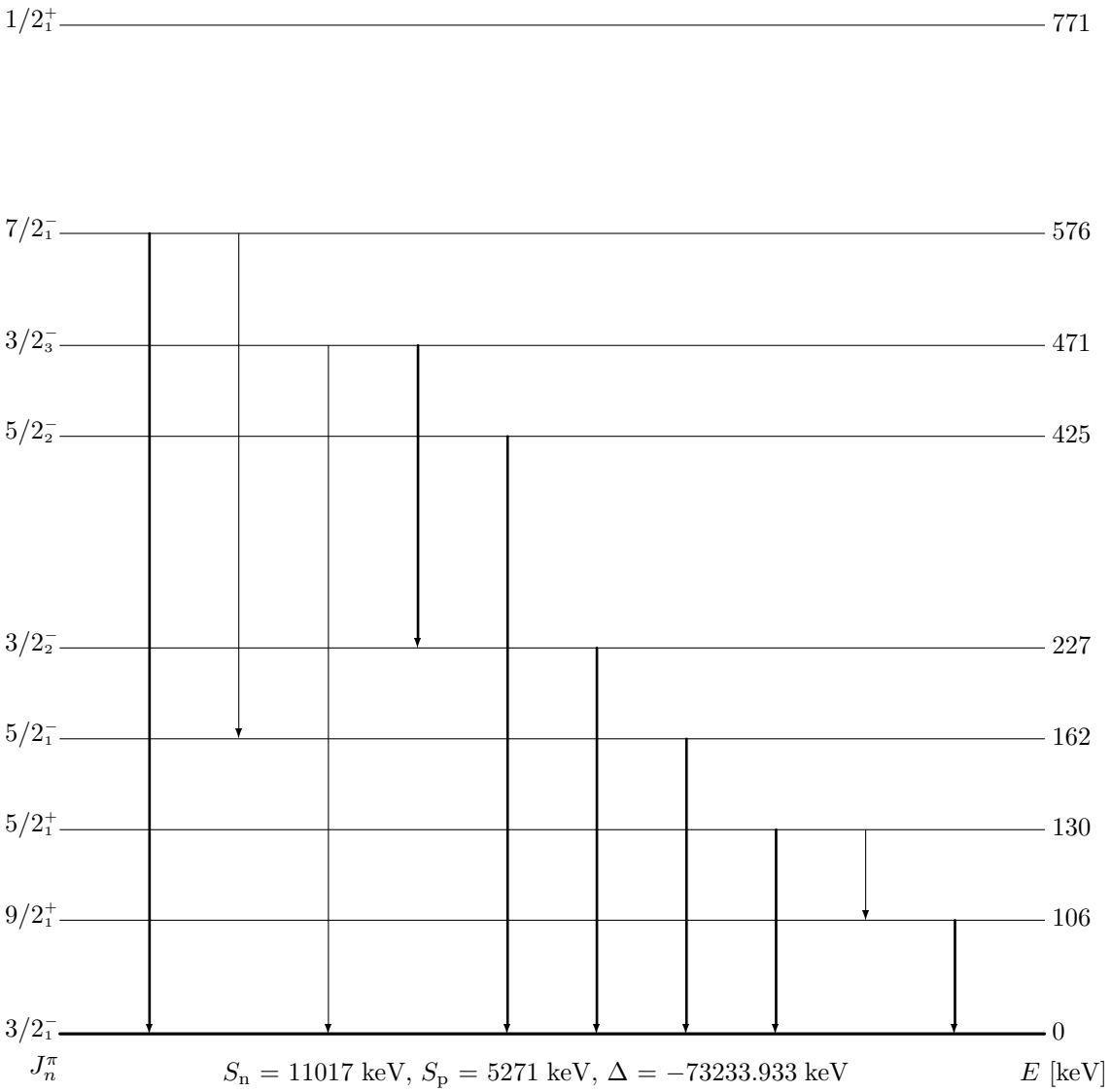
J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92B2, 98B]
$9/2^+_1$	0	22.3 m	(d,p)
$1/2^-_1$	229	70.1 s	(d,p)
$1/2^+_1$	540		(d,p)
$5/2^+_1$	582	3 ns	B(E2→ $1/2^+_1$) < 62 W.u., B(E2→ $9/2^+_1$) = 0.13 W.u., (d,p)
$3/2^+_1$	822		(d,p)
$3/2^+_2$	963		(d,p)
$3/2^+_3$	1100		(d,p)
$5/2^+_2$	1331		(d,p)
$5/2^+_3$	1665		(d,p)
$5/2^+_4$	2314		(d,p)
$5/2^+_5$	2483		(d,p)
$3/2^+_4$	2536		(d,p)
$5/2^+_6$	2741		(d,p)
$5/2^+_7$	3212		(d,p)
$5/2^+_8$	3353		(d,p)
$5/2^+_9$	3462		(d,p)



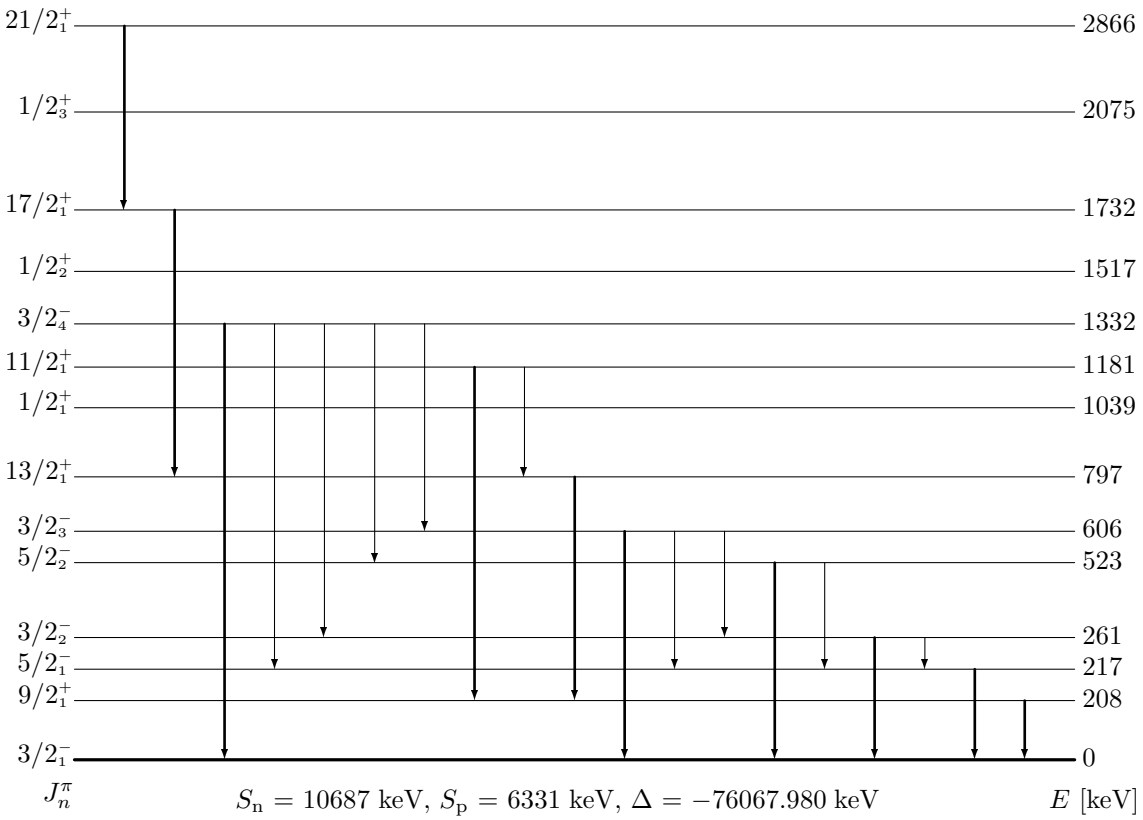
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93K2, 98B]
$1/2_1^-$	0	3.4 m	
$5/2_1^-$	27		
$3/2_1^-$	178	0.35 ns	B(M1/E2→ $1/2_1^-$) = 0.008/5. · 10^1 W.u. (δ = 0.39), log ft = 5.80 (β^+ from $5/2^-$)
$5/2_1^+$	286		
$9/2_1^+$	473	1.1 ns	B(E2→ $5/2_1^+$) = 122 W.u.
$7/2_1^-$	681	15 ps	B(E2→ $3/2_1^-$) = 45 W.u., B(M1/E2→ $5/2_1^-$) = 0.00079/2.6 W.u., log ft = 5.90 (β^+ from $5/2^-$)
$9/2_1^-$	943	2.77 ps	B(E2→ $5/2_1^-$) = 17 W.u.
$13/2_1^+$	1057	3.3 ps	B(E2→ $9/2_1^+$) = 140 W.u.
$11/2_1^-$	1255	3.0 ps	B(E2→ $7/2_1^-$) = 167 W.u.
$13/2_1^-$	1662	0.97 ps	B(E2→ $9/2_1^-$) = 168 W.u.
$17/2_1^+$	1861	1.04 ps	B(E2→ $13/2_1^+$) = 89 W.u.
$15/2_1^-$	1989	0.90 ps	B(E2→ $11/2_1^-$) = 1.6 · 10^2 W.u.
$17/2_1^-$	2512	0.69 ps	
$21/2_1^+$	2856	0.43 ps	B(E2→ $17/2_1^+$) = 74 W.u.
$19/2_1^-$	2874	0.59 ps	
$21/2_1^-$	3465	0.38 ps	
$23/2_1^-$	3910	0.26 ps	



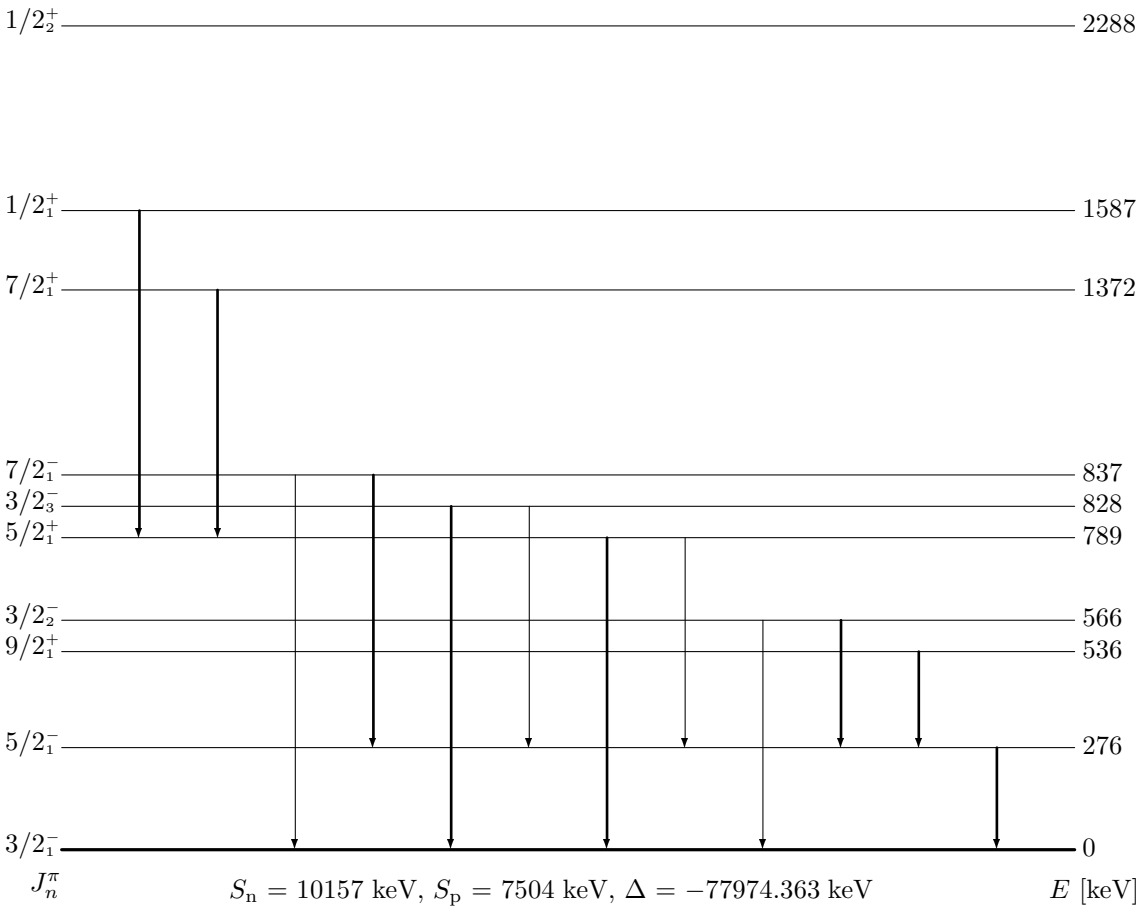
J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95S, 98B]
1^-_1	0	16.2 h	log ft = 6.00 (β^+ from 0^+), Q = 0.270 barn, μ = 0.54821 μ_n
1^+_1	316		log ft = 4.83 (β^+ from 0^+)
1^+_2	355	0.5 ns	log ft = 5.52 (β^+ from 0^+)
1^+_3	452	0.4 ns	log ft = 5.03 (β^+ from 0^+)
1^+_4	616		log ft = 5.97 (β^+ from 0^+)
1^+_5	868		log ft = 5.54 (β^+ from 0^+)
1^+_6	898		log ft = 5.47 (β^+ from 0^+)
1^+_7	937		log ft = 5.59 (β^+ from 0^+)
1^+_8	1048		log ft = 5.57 (β^+ from 0^+)



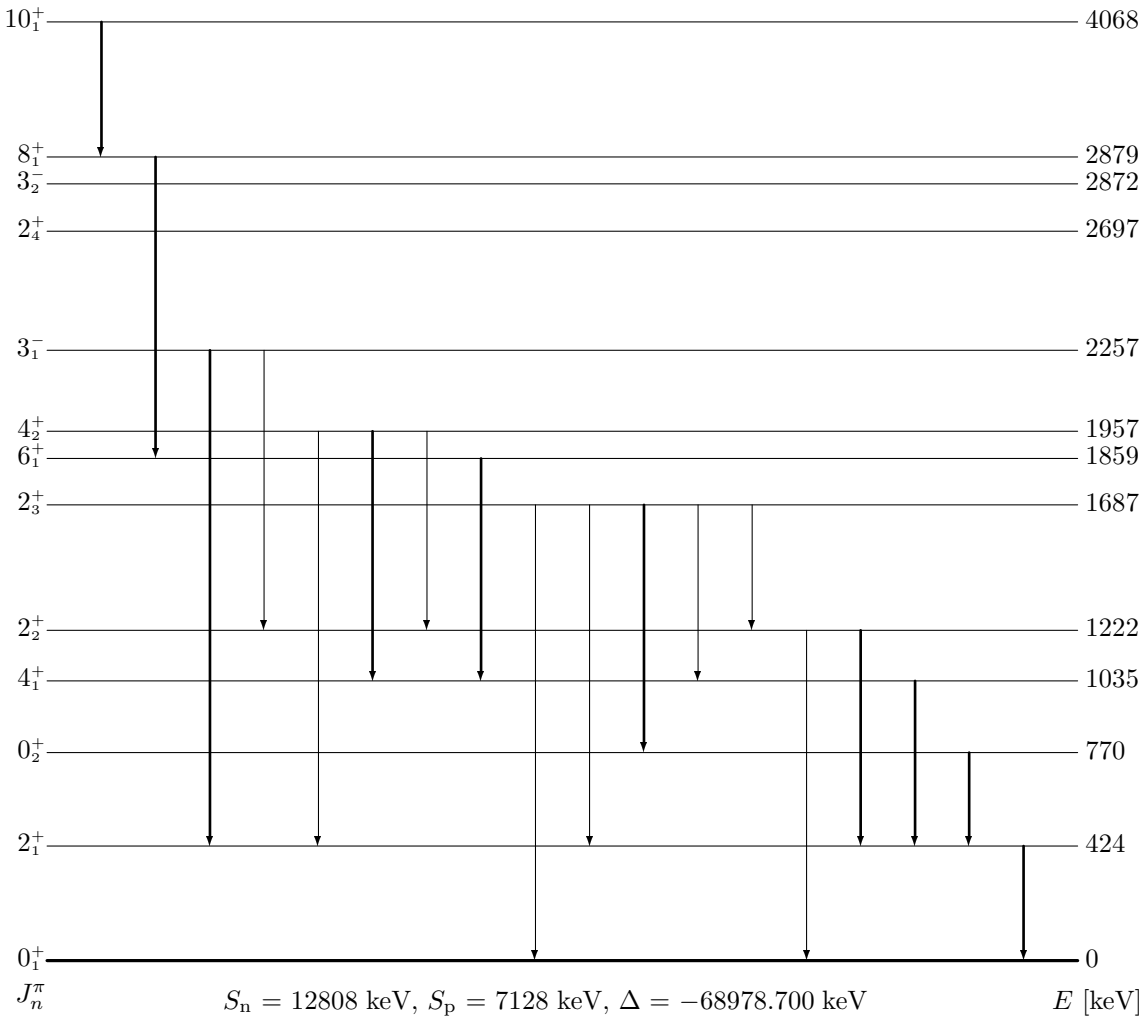
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [97F, 98B]
$3/2_1^-$	0	57.036 h	log ft = 6.60 (β^+ from $5/2^+$), μ = 0.9738 μ_n
$9/2_1^+$	106	4.28 m	B(E3→ $3/2_1^-$) = 0.0122 W.u., (^{3}He,d)
$5/2_1^+$	130	9.3 ns	B(E2→ $9/2_1^+$) = $1.5 \cdot 10^2$ W.u., B(E1→ $3/2_1^-$) = $1.67 \cdot 10^{-5}$ W.u., log ft = 5.54 (β^+ from $5/2^+$), μ = 3.3 μ_n, (^{3}He,d)
$5/2_1^-$	162	498 ps	B(M1/E2→ $3/2_1^-$) = 0.0094/35 W.u. ($\delta = -0.27$), log ft = 7.84 (β^+ from $5/2^+$), (^{3}He,d)
$3/2_2^-$	227		(^{3}He,d)
$5/2_2^-$	425		(^{3}He,d)
$3/2_3^-$	471		(^{3}He,d)
$7/2_1^-$	576	9.8 ps	B(M1→ $5/2_1^-$) = 0.0041 W.u., B(E2→ $3/2_1^-$) = 37 W.u., (^{3}He,d)
$1/2_1^+$	771		(^{3}He,d)



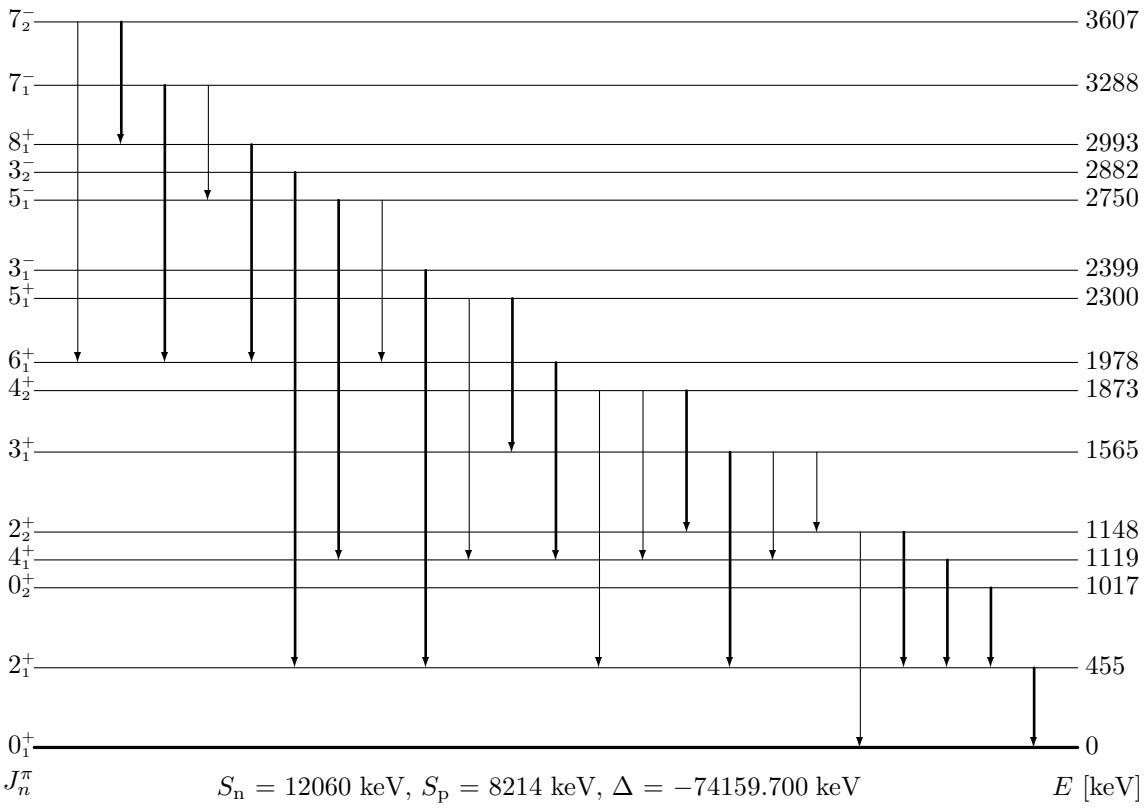
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93S, 98B]
$3/2_1^-$	0	stable	log ft = 11.10 (β^- from $7/2^+$), log ft = 5.62 (β^+ from $1/2^-$), Q = 0.331 barn, μ = 2.106400 μ_n
$9/2_1^+$	208	4.86 s	B(E3→ $3/2_1^-$) = 0.031 W.u., (γ,γ'), Coul. ex., (^{3}He,d)
$5/2_1^-$	217	51 ps	B(M1/E2→ $3/2_1^-$) = 0.041/9 W.u. (δ = 0.08), Coul. ex., (^{3}He,d)
$3/2_2^-$	261	0.13 ns	B(M1/E2→ $3/2_1^-$) = 0.0091/ < 1.0 W.u. (δ = 0.13), B(M1→ $5/2_1^-$) = 0.032 W.u., log ft = 6.15 (β^+ from $1/2^-$), (γ,γ'), Coul. ex.
$5/2_2^-$	523	1.3 ps	B(M1/E2→ $3/2_1^-$) = 0.10/21 W.u. (δ = 0.21), log ft = 7.80 (β^+ from $1/2^-$), (γ,γ'), Coul. ex., (^{3}He,d)
$3/2_3^-$	606	2.0 ps	B(M1→ $3/2_2^-$) = 0.0053 W.u., B(M1/E2→ $5/2_1^-$) = 0.022/7 W.u. (δ = −0.19), B(M1/E2→ $3/2_1^-$) = 0.030/9 W.u. (δ = 0.30), log ft = 5.88 (β^+ from $1/2^-$), (γ,γ'), Coul. ex., (^{3}He,d)
$13/2_1^+$	797	9.0 ps	B(E2→ $9/2_1^+$) = 44 W.u.
$1/2_1^+$	1039		(^{3}He,d)
$11/2_1^+$	1181	0.55 ps	B(E2/M1→ $9/2_1^+$) = 44/0.005 W.u. (δ = −2.6)
$3/2_4^-$	1332		log ft = 5.76 (β^+ from $1/2^-$), (^{3}He,d)
$1/2_2^+$	1517		(^{3}He,d)
$17/2_1^+$	1732	1.18 ps	B(E2→ $13/2_1^+$) = 33 W.u.
$1/2_3^+$	2075		(^{3}He,d)
$21/2_1^+$	2866	0.42 ps	B(E2→ $17/2_1^+$) = 36 W.u.



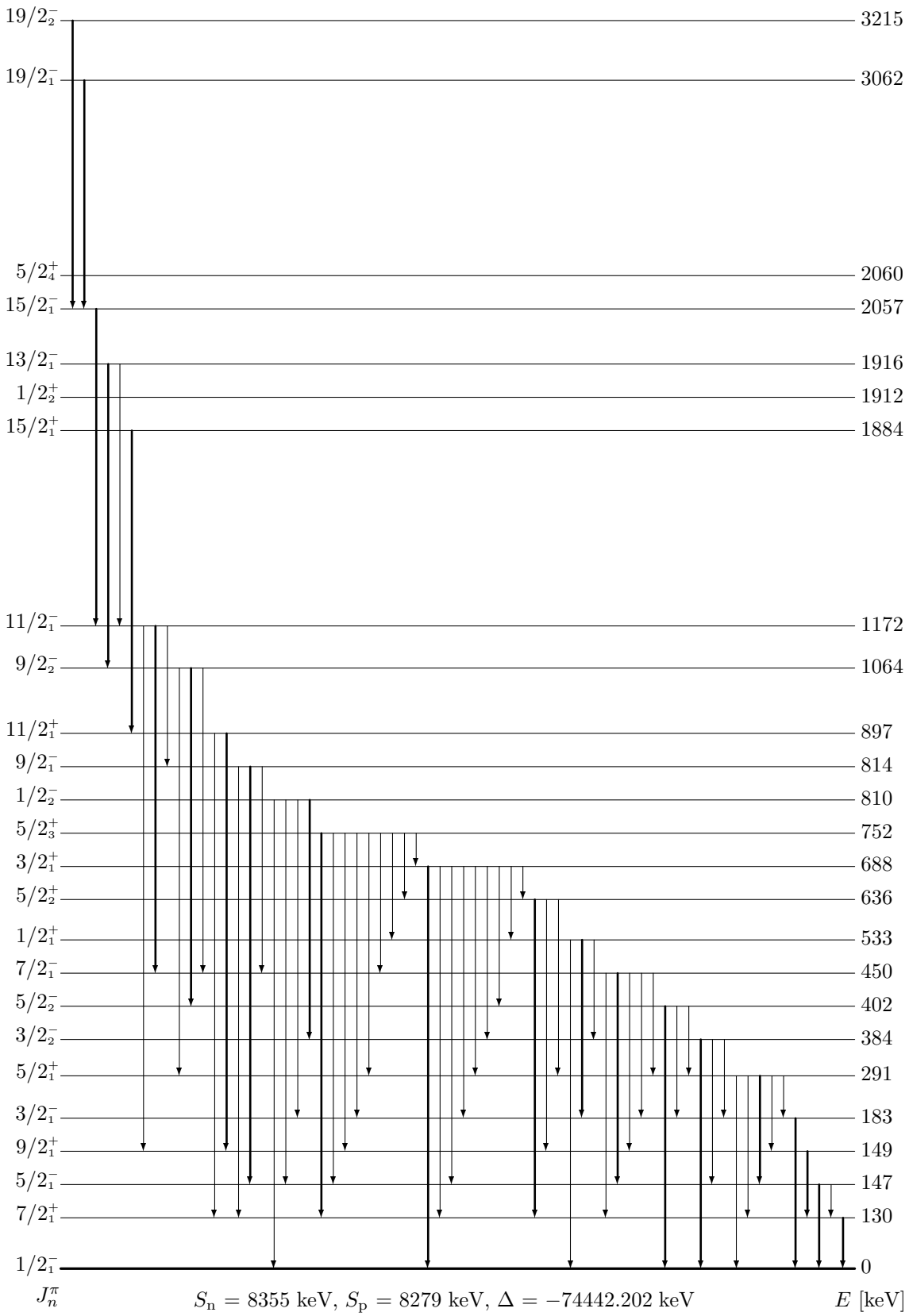
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [96B, 98B]
$3/2_1^-$	0	stable	log ft = 5.01 (β^- from $1/2^-$), log ft = 4.89 (β^+ from $1/2^-$), log ft = 11.01 (β^+ from $7/2^+$), Q = 0.276 barn, μ = 2.270562 μ_n
$5/2_1^-$	276	9.7 ps	B(E2/M1→ $3/2_1^-$) = 16.3/0.106 W.u. (δ = −0.10), log ft = 9.33 (β^+ from $7/2^+$), μ = 1.6 μ_n, Coul. ex., (^{3}He,d)
$9/2_1^+$	536	34.6 μs	B(M2→ $5/2_1^-$) = 0.038 W.u., log ft = 8.25 (β^- from $7/2^+$), μ = 5.694 μ_n, (^{3}He,d)
$3/2_2^-$	566	77 ps	B(E2/M1→ $5/2_1^-$) = 66/0.0039 W.u. (δ = 1.08), B(E2/M1→ $3/2_1^-$) = $1.5/4.3 \cdot 10^{-5}$ W.u. (δ = −3.0), log ft = 6.37 (β^- from $1/2^-$), Coul. ex.
$5/2_1^+$	789		(^{3}He,d)
$3/2_3^-$	828	0.46 ps	B(E2/M1→ $5/2_1^-$) = 30/0.08 W.u. (δ = 0.32), B(E2/M1→ $3/2_1^-$) = 4.5/0.07 W.u. (δ = 0.175), log ft = 6.19 (β^- from $1/2^-$), Coul. ex., (^{3}He,d)
$7/2_1^-$	837	1.10 ps	B(E2/M1→ $5/2_1^-$) = 22/0.14 W.u. (δ = −0.19), B(E2→ $3/2_1^-$) = 13.9 W.u., μ = 1.4 μ_n, Coul. ex.
$7/2_1^+$	1372		(^{3}He,d)
$1/2_1^+$	1587		(^{3}He,d)
$1/2_2^+$	2288		(^{3}He,d)



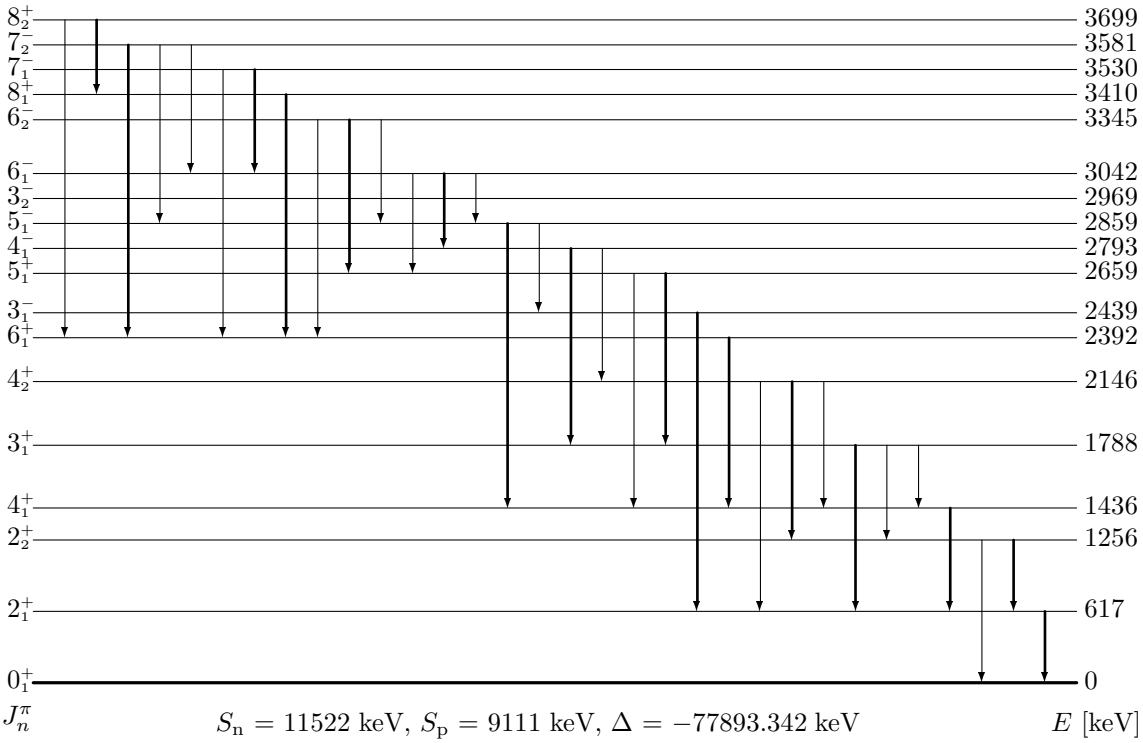
J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95S, 98B]
0^+_1	0	14.8 h	Coul. ex., (p,t)
2^+_1	424	24.9 ps	log ft = 6.83 (β^+ from $1^{(-)}$), Coul. ex., (p,t)
0^+_2	770		log ft = 7.47 (β^+ from $1^{(-)}$), (p,t)
4^+_1	1035	3.3 ps	log ft = 7.29 (β^+ from $1^{(-)}$), (p,t)
2^+_2	1222	1 ps	B(M1/E2→ 2^+_1) = 0.024/2.0 W.u. (δ = 0.2), B(E2→ 0^+_1) = 4.7 W.u., log ft = 6.76 (β^+ from $1^{(-)}$), (p,t)
2^+_3	1687		log ft = 7.00 (β^+ from $1^{(-)}$), (p,t)
6^+_1	1859	0.83 ps	
4^+_2	1957	0.90 ps	B(E2→ 2^+_2) = 45 W.u.
3^-_1	2257		log ft = 7.43 (β^+ from $1^{(-)}$), (p,t)
2^+_4	2697		(p,t)
3^-_2	2872		(p,t)
8^+_1	2879	0.22 ps	B(E2→ 6^+_1) = 122 W.u.
10^+_1	4068	0.104 ps	B(E2→ 8^+_1) = 120 W.u.



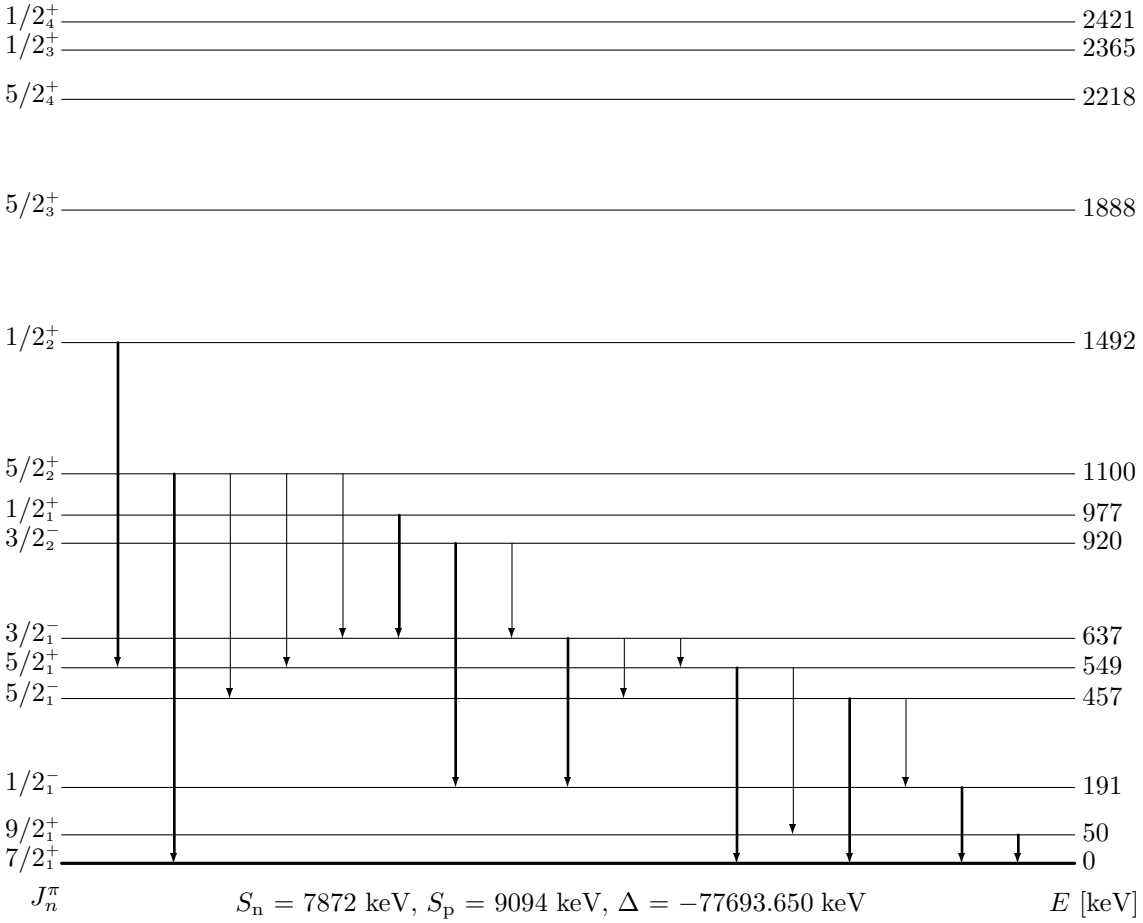
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [91R, 98B]
0_1^+	0	stable	log ft = 7.93 (β^+ from $0^{(+)}$)
2_1^+	455	23.9 ps	B(E2→ 0_1^+) = 61 W.u., log ft = 5.60 (β^- from 1^+), log ft = 8.30 (β^+ from $0^{(+)}$)
0_2^+	1017		log ft = 8.17 (β^+ from $0^{(+)}$), (p,t)
4_1^+	1119	2.5 ps	B(E2→ 2_1^+) = 88 W.u., log ft = 6.86 (β^+ from $4^{(-)}$), (p,p′)
2_2^+	1148	3.7 ps	B(E2/M1→ 2_1^+) = 6/0.0088 W.u. (δ = 0.5), B(E2→ 0_1^+) = 1.5 W.u., log ft = 7.90 (β^+ from $0^{(+)}$), log ft = 9.55 (β^+ from $4^{(-)}$), (p,p′)
3_1^+	1565	4.8 ps	log ft = 7.10 (β^+ from $4^{(-)}$)
4_2^+	1873	1.4 ps	B(E2→ 2_2^+) = 58 W.u., B(E2/M1→ 4_1^+) = 24/0.0026 W.u. (δ = −2), log ft = 7.11 (β^+ from $4^{(-)}$)
6_1^+	1978	0.6 ps	B(E2→ 4_1^+) = 102 W.u., log ft = 9.35 (β^+ from $4^{(-)}$)
5_1^+	2300	1.2 ps	B(E2→ 3_1^+) = 77 W.u., B(E2/M1→ 4_1^+) = 2.6/0.0007 W.u. (δ = 2), log ft = 7.12 (β^+ from $4^{(-)}$)
3_1^-	2399	0.62 ps	B(E1→ 2_1^+) = $8.1 \cdot 10^{-5}$ W.u., log ft = 6.91 (β^+ from $4^{(-)}$), (p,p′), (p,t)
5_1^-	2750	1.5 ps	B(E1→ 6_1^+) = $4.4 \cdot 10^{-5}$ W.u., B(E1→ 4_1^+) = $5.2 \cdot 10^{-5}$ W.u., log ft = 6.58 (β^+ from $4^{(-)}$)
3_2^-	2882		log ft = 7.22 (β^+ from $4^{(-)}$), (p,p′), (p,t)
8_1^+	2993	0.27 ps	B(E2→ 6_1^+) = 98 W.u.
7_1^-	3288	1.98 ps	B(E2→ 5_1^-) = 146 W.u., B(E1→ 6_1^+) = $4.5 \cdot 10^{-5}$ W.u.
7_2^-	3607	1.9 ps	B(E1→ 8_1^+) = $6 \cdot 10^{-4}$ W.u., B(E1→ 6_1^+) = $1.5 \cdot 10^{-5}$ W.u.


19/2₂⁻ 3215
19/2₁⁻ 3062
5/2₄⁺ 2060
15/2₁⁻ 2057
13/2₁⁻ 1916
1/2₂⁺ 1912
15/2₁⁺ 1884
11/2₁⁻ 1172
9/2₂⁻ 1064
11/2₁⁺ 897
9/2₁⁻ 814
1/2₂⁻ 810
5/2₃⁺ 752
3/2₁⁺ 688
5/2₂⁺ 636
1/2₁⁺ 533
7/2₁⁻ 450
5/2₂⁻ 402
3/2₂⁻ 384
5/2₁⁺ 291
3/2₁⁻ 183
9/2₁⁺ 149
5/2₁⁻ 147
7/2₁⁺ 130
1/2₁⁻ 0
J_n^π
S_n = 8355 keV, S_p = 8279 keV, Δ = −74442.202 keV
E [keV]

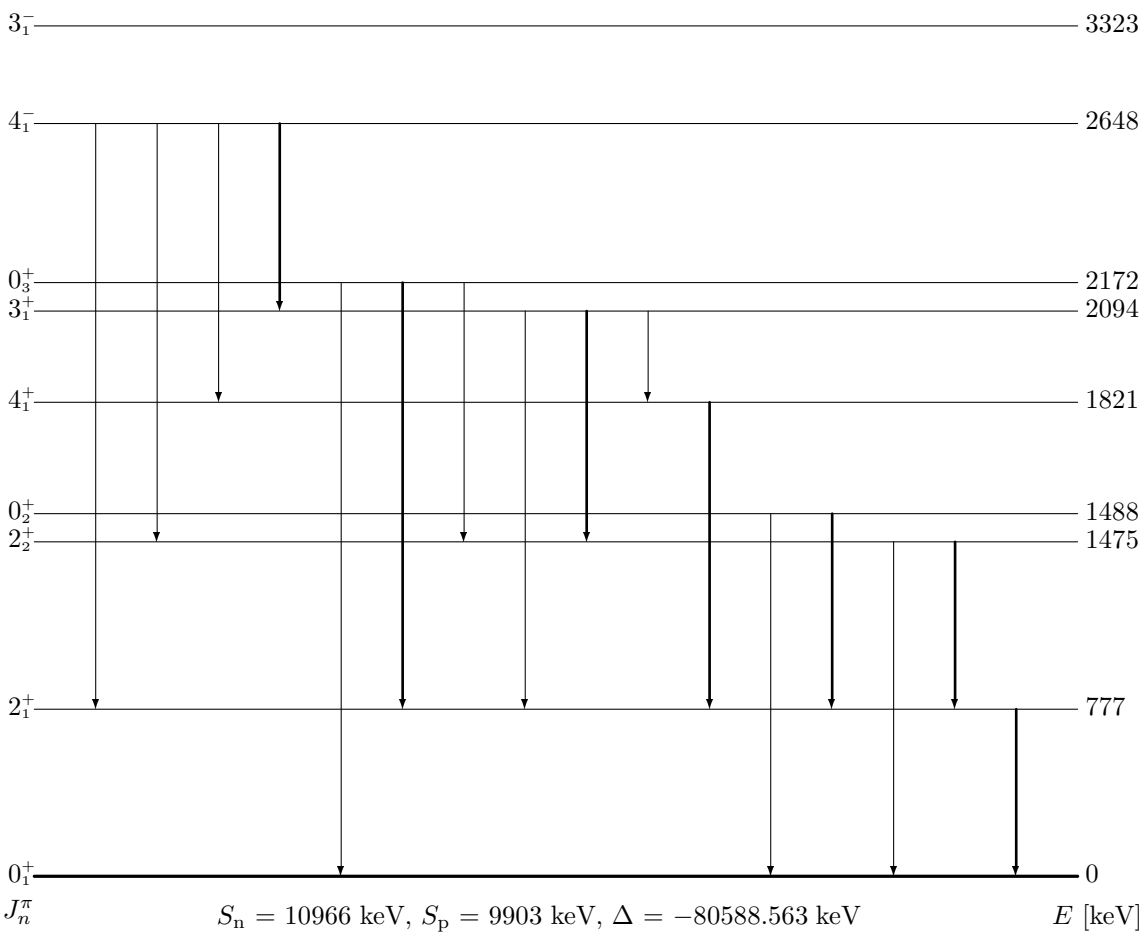
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [93S, 98B]
$1/2_1^-$	0	35.04 h	log $ft = 8.50$ (β^+ from $5/2^+$), (p,d), (d,p), (^{3}He,t)
$7/2_1^+$	130	50 s	B(E3$\rightarrow 1/2_1^-$) = 0.0287 W.u., log $ft = 6.15$ (β^+ from $5/2^+$)
$5/2_1^-$	147	78.7 ns	B(E1$\rightarrow 7/2_1^+$) = $1.24 \cdot 10^{-5}$ W.u., B(E2$\rightarrow 1/2_1^-$) = 3.40 W.u., log ft = 7.20 (β^+ from $5/2^+$), Q = 0.45 barn, μ = 1.124 μ_n, (d,p), (^{3}He,t)
$9/2_1^+$	149		log $ft = 7.70$ (β^+ from $5/2^+$), (p,d), (d,p), (^{3}He,t)
$3/2_1^-$	183	0.21 ns	B(M1$\rightarrow 1/2_1^-$) = 0.017 W.u., log $ft = 7.90$ (β^+ from $5/2^+$), (^{3}He,t)
$5/2_1^+$	291	0.62 ns	B(M1/E2$\rightarrow 7/2_1^+$) = 0.0027/11 W.u. ($\delta = 0.2$), B(E2$\rightarrow 9/2_1^+$) = 22 W.u., B(E1$\rightarrow 5/2_1^-$) = 0.00011 W.u., log $ft = 5.88$ (β^+ from $5/2^+$)
$3/2_2^-$	384	21 ps	B(M1/E2$\rightarrow 5/2_1^-$) < 0.00051/ < 17 W.u. ($\delta = 0.8$), B(M1/E2$\rightarrow 1/2_1^-$) = 0.016/0.7 W.u. ($\delta = -0.07$), log $ft = 7.50$ (β^+ from $5/2^+$), (d,p), (^{3}He,t)
$5/2_2^-$	402	33 ps	B(M1/E2$\rightarrow 3/2_1^-$) = 0.028/4 W.u. ($\delta = 0.07$), B(E1$\rightarrow 5/2_1^+$) = 0.00021 W.u., B(E2$\rightarrow 1/2_1^-$) = 42 W.u., log $ft = 7.40$ (β^+ from $5/2^+$), (d,p)
$7/2_1^-$	450	51 ps	B(M1/E2$\rightarrow 5/2_1^-$) = 0.0064/43 W.u. ($\delta = 0.69$), B(E2$\rightarrow 3/2_1^-$) = 16 W.u., B(E1$\rightarrow 7/2_1^+$) = $5.9 \cdot 10^{-5}$ W.u., log $ft = 8.20$ (β^+ from $5/2^+$), (^{3}He,t)
$1/2_1^+$	533		log $ft = 7.30$ (β^+ from $5/2^+$), (d,p)
$5/2_2^+$	636	10 ps	log $ft = 6.68$ (β^+ from $5/2^+$), (d,p)
$3/2_1^+$	688		log $ft = 5.05$ (β^+ from $5/2^+$), (d,p)
$5/2_3^+$	752	21 ps	B(M1$\rightarrow 3/2_1^+$) = 0.026 W.u., B(E2$\rightarrow 1/2_1^+$) = 111 W.u., B(M1/E2$\rightarrow 7/2_1^+$) = 0.00100/ < 6.6 W.u. ($\delta = 1$), log $ft = 5.59$ (β^+ from $5/2^+$), (d,p)
$1/2_2^-$	810		(d,p)
$9/2_1^-$	814	4.2 ps	B(M1/E2$\rightarrow 7/2_1^-$) = 0.008/20 W.u. ($\delta = 0.50$), B(E2$\rightarrow 5/2_1^-$) = 39 W.u.
$11/2_1^+$	897	1.50 ps	B(M1/E2$\rightarrow 9/2_1^+$) = 0.022/16 W.u. ($\delta = -0.55$), B(E2$\rightarrow 7/2_1^+$) = 11.8 W.u.
$9/2_2^-$	1064	2.1 ps	B(M1/E2$\rightarrow 7/2_1^-$) = 0.0056/0.07 W.u. ($\delta = 0.06$), B(E2$\rightarrow 5/2_2^-$) = 80 W.u.
$11/2_1^-$	1172	2.8 ps	B(E2$\rightarrow 7/2_1^-$) = 44 W.u.
$15/2_1^+$	1884	0.34 ps	B(E2$\rightarrow 11/2_1^+$) = 44 W.u.
$1/2_2^+$	1912		(d,p)
$13/2_1^-$	1916	0.81 ps	B(E2$\rightarrow 9/2_2^-$) = 67 W.u.
$15/2_1^-$	2057	0.61 ps	B(E2$\rightarrow 11/2_1^-$) = 78 W.u.
$5/2_4^+$	2060		(d,p)
$19/2_1^-$	3062	0.69 ps	B(E2$\rightarrow 15/2_1^-$) = 36 W.u.
$19/2_2^-$	3215	1.9 ps	B(E2$\rightarrow 15/2_1^-$) = 4 W.u.



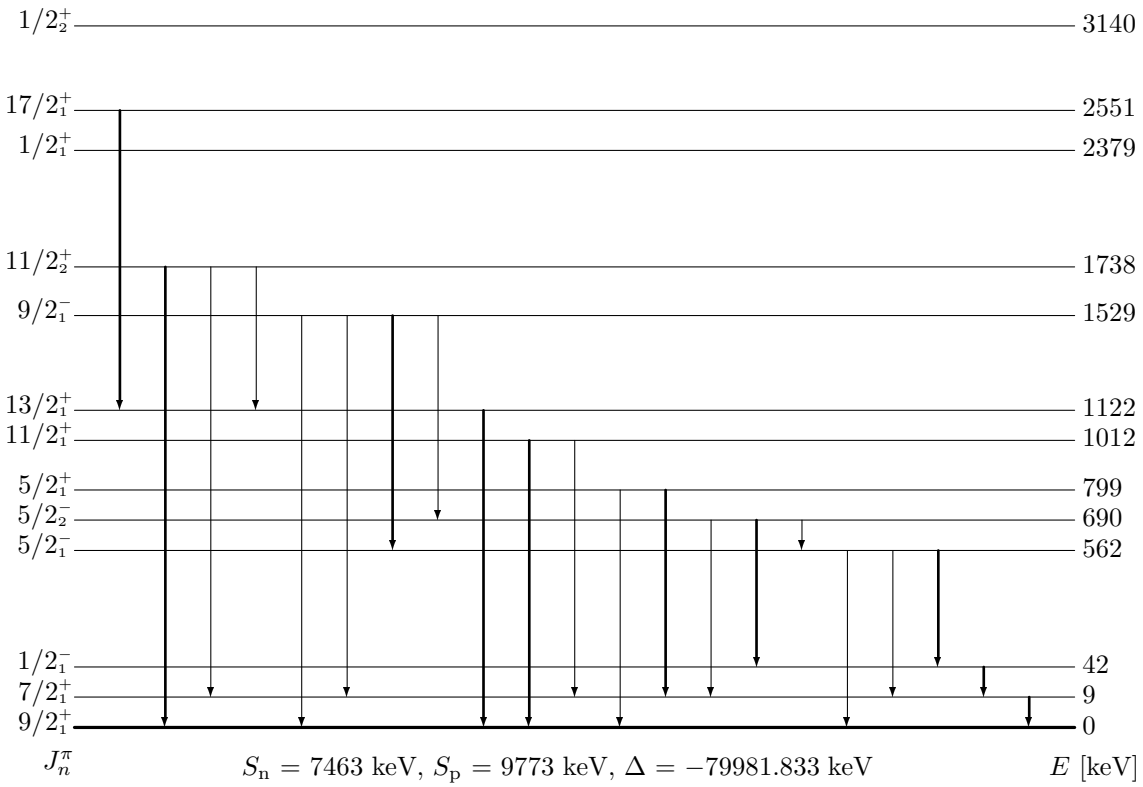
J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92S, 98B]
0_1^+	0	stable	log ft = 5.48 (β^- from 1^+), log ft = 4.93 (β^+ from 1^+)
2_1^+	617	8.7 ps	B(E2→ 0_1^+) = 35.6 W.u., log ft = 5.98 (β^- from 1^+), log ft = 5.19 (β^+ from 1^+), Coul. ex., (p,p′), (^{3}He,d)
2_2^+	1256	7.6 ps	B(E2/M1→ 2_1^+) = 25/0.00023 W.u. (δ = 6), B(E2→ 0_1^+) = 0.30 W.u., log ft = 6.26 (β^- from 1^+), log ft = 5.87 (β^+ from 1^+), (p,p′), (^{3}He,d)
4_1^+	1436	1.7 ps	B(E2→ 2_1^+) = 44 W.u., (p,p′), (^{3}He,d)
3_1^+	1788	7.1 ps	B(E2/M1→ 4_1^+) = 50/ < 0.00016 W.u. (δ = 6), B(E2/M1→ 2_2^+) = 34/0.00086 W.u. (δ = 3.0), B(E2/M1→ 2_1^+) = 0.57/0.00037 W.u. (δ = 1.3)
4_2^+	2146	0.76 ps	B(E2/M1→ 4_1^+) = 32/0.003 W.u. (δ = 2.0), B(E2→ 2_2^+) = 50 W.u.
6_1^+	2392	0.56 ps	B(E2→ 4_1^+) = 62 W.u.
3_1^-	2439	1.4 ps	(p,p′), (p,t)
5_1^+	2659	0.83 ps	B(E2→ 3_1^+) = 50 W.u., B(E2/M1→ 4_1^+) = 1.2/0.0022 W.u. (δ = 0.8)
4_1^-	2793	2.1 ps	B(E1→ 3_1^+) = $1.6 \cdot 10^{-4}$ W.u.
5_1^-	2859	2.4 ps	B(E1→ 4_1^+) = $5.0 \cdot 10^{-5}$ W.u.
3_2^-	2969		(p,p′), (p,t)
6_1^-	3042	2.2 ns	B(E2/M1→ 5_1^-) = 0.11/0.00056 W.u. (δ = 0.07), B(E2→ 4_1^-) = 7.6 W.u.
6_2^-	3345	4.9 ps	B(E1→ 5_1^+) = 0.00023 W.u.
8_1^+	3410	0.28 ps	B(E2→ 6_1^+) = 90 W.u.
7_1^-	3530		
7_2^-	3581	2.7 ps	B(E2→ 5_1^-) = 21 W.u.
8_2^+	3699		



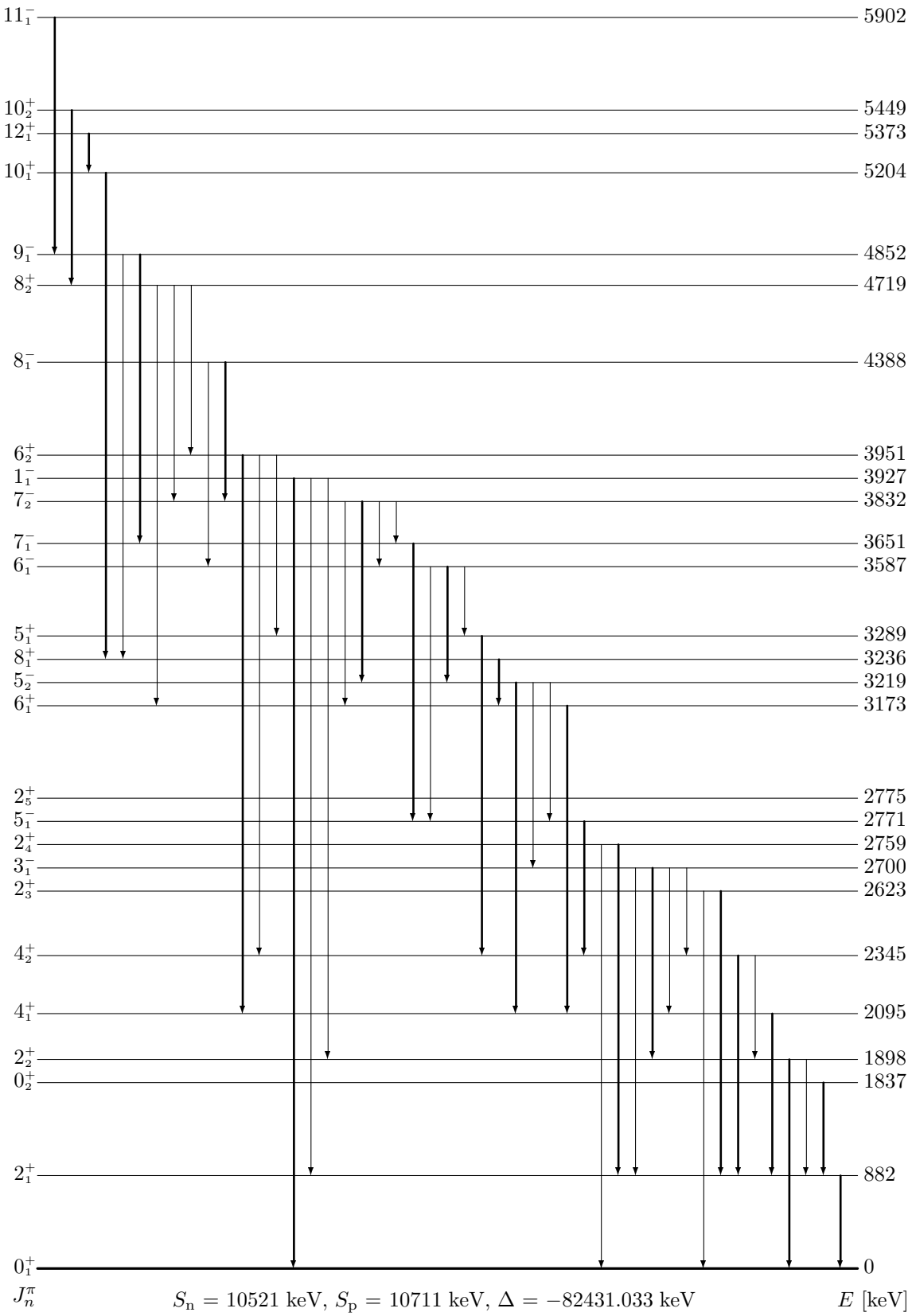
J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [96B, 98B]
$7/2^+_1$	0	2.29·10^5 y	log ft = 8.50 (β^+ from $3/2^-$), log ft = 6.30 (β^+ from $9/2^+$), Q = 0.629 barn, $\mu = -0.909\ \mu_n$, (^{3}He,t)
$9/2^+_1$	50	3.9 ns	B(M1→ $7/2^+_1$) = 0.019 W.u., log ft = 6.01 (β^+ from $9/2^+$), (d,p), (^{3}He,t)
$1/2^-_1$	191	13.10 s	B(E3→ $7/2^+_1$) = 0.0175 W.u., log ft = 5.14 (β^+ from $3/2^-$), $\mu = 0.586\ \mu_n$, (p,n), (d,p), (^{3}He,t)
$5/2^-_1$	457		(d,p), (^{3}He,t)
$5/2^+_1$	549		log ft = 8.30 (β^+ from $3/2^-$), (d,p), (^{3}He,t)
$3/2^-_1$	637		log ft = 5.22 (β^+ from $3/2^-$), (d,p), (^{3}He,t)
$3/2^-_2$	920		log ft = 6.92 (β^+ from $3/2^-$), (d,p), (^{3}He,t)
$1/2^+_1$	977		(d,p)
$5/2^+_2$	1100		log ft = 7.10 (β^+ from $3/2^-$), (d,p)
$1/2^+_2$	1492		(d,p)
$5/2^+_3$	1888		(d,p)
$5/2^+_4$	2218		(d,p)
$1/2^+_3$	2365		(d,p)
$1/2^+_4$	2421		(d,p)



J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [95K, 98B]
0_1^+	0	stable	log ft = 8.88 (β^- from 2^-), log ft = 4.57 (β^+ from 1^+)
2_1^+	777	4.45 ps	B(E2→ 0_1^+) = 21.3 W.u., log ft = 9.80 (β^- from 5^-), log ft = 7.91 (β^- from 2^-), log ft = 4.92 (β^+ from 1^+), Coul. ex., (p,p′), (^{3}He,d)
2_2^+	1475	15 ps	B(M1/E2→ 2_1^+) = 0.00050/5.5 W.u. (δ = 2.1), B(E2→ 0_1^+) = 0.094 W.u., log ft = 9.30 (β^- from 5^-), log ft = 7.93 (β^- from 2^-), log ft = 6.35 (β^+ from 1^+), log ft = 8.00 (β^+ from 5^-), Coul. ex., (p,p′), (^{3}He,d)
0_2^+	1488	10 ps	B(E2→ 2_1^+) = 15 W.u., log ft = 10.40 (β^- from 2^-), log ft = 6.80 (β^+ from 1^+), Coul. ex., (^{3}He,d)
4_1^+	1821	0.67 ps	B(E2→ 2_1^+) = 32 W.u., log ft = 9.10 (β^- from 5^-), Coul. ex., (p,p′), (^{3}He,d)
3_1^+	2094		log ft = 8.90 (β^- from 5^-), log ft = 8.40 (β^- from 2^-)
0_3^+	2172	2 ps	B(E2→ 2_1^+) = 2.2 W.u., log ft = 10.50 (β^- from 2^-), log ft = 5.06 (β^+ from 1^+), Coul. ex.
4_1^-	2648		log ft = 5.05 (β^- from 5^-), log ft = 4.95 (β^+ from 5^-)
3_1^-	3323		(p,p′), (p,t)



J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [92B2, 98B]
$9/2^+_1$	0	stable	log ft = 8.50 (β^+ from $5/2^-$), Q = 0.253 barn, $\mu = -0.970669\ \mu_n$
$7/2^+_1$	9	147 ns	B(M1/E2→ $9/2^+_1$) = 0.0100/23 W.u. (δ = 0.0130), log ft = 8.50 (β^- from $(3/2)^-$), log ft = 7.88 (β^+ from $5/2^-$), Q = 0.495 barn, $\mu = -0.943\ \mu_n$, Coul. ex.
$1/2^-_1$	42	1.83 h	B(E3→ $7/2^+_1$) = 0.00624 W.u., (d,p)
$5/2^-_1$	562	6 ps	B(E2→ $1/2^-_1$) = 80 W.u., B(E1→ $7/2^+_1$) = $9 \cdot 10^{-5}$ W.u., log ft = 6.10 (β^+ from $5/2^-$), (^{3}He,α)
$5/2^-_2$	690	10 ps	B(E2→ $1/2^-_1$) = 15 W.u., B(E1→ $7/2^+_1$) = $2.5 \cdot 10^{-5}$ W.u., log ft = 8.37 (β^+ from $5/2^-$), (^{3}He,α)
$5/2^+_1$	799	1.7 ps	B(M1/E2→ $7/2^+_1$) = $5 \cdot 10^{-5}$/37 W.u. (δ = 19), B(E2→ $9/2^+_1$) = 13 W.u., log ft = 9.45 (β^- from $(3/2)^-$), log ft = 7.02 (β^+ from $5/2^-$), Coul. ex., (d,p)
$11/2^+_1$	1012	0.8 ps	B(E2→ $7/2^+_1$) = 1.6 W.u., B(M1/E2→ $9/2^+_1$) = 0.0063/22 W.u. ($\delta = -1.73$), Coul. ex.
$13/2^+_1$	1122	1.3 ps	B(E2→ $9/2^+_1$) = 11 W.u., Coul. ex.
$9/2^-_1$	1529	0.9 ps	B(E2→ $5/2^-_2$) = 7 W.u., B(E2→ $5/2^-_1$) = 16 W.u.
$11/2^+_2$	1738	0.35 ps	B(M1/E2→ $13/2^+_1$) = 0.04/4 W.u. (δ = 0.18), B(E2→ $7/2^+_1$) = 1.6 W.u., B(M1/E2→ $9/2^+_1$) = 0.0025/0.7 W.u. (δ = 0.84)
$1/2^+_1$	2379		(d,p)
$17/2^+_1$	2551	0.9 ps	
$1/2^+_2$	3140		(d,p)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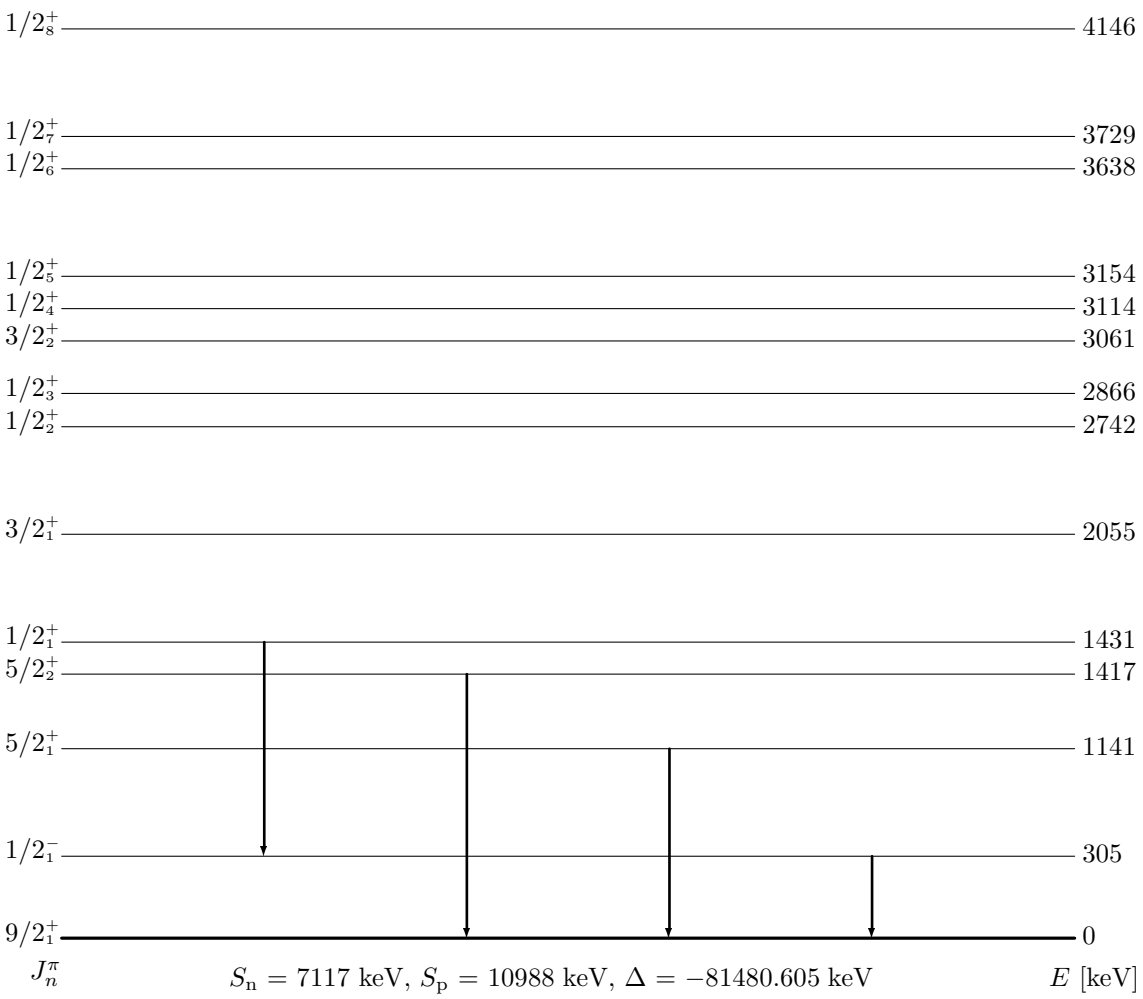
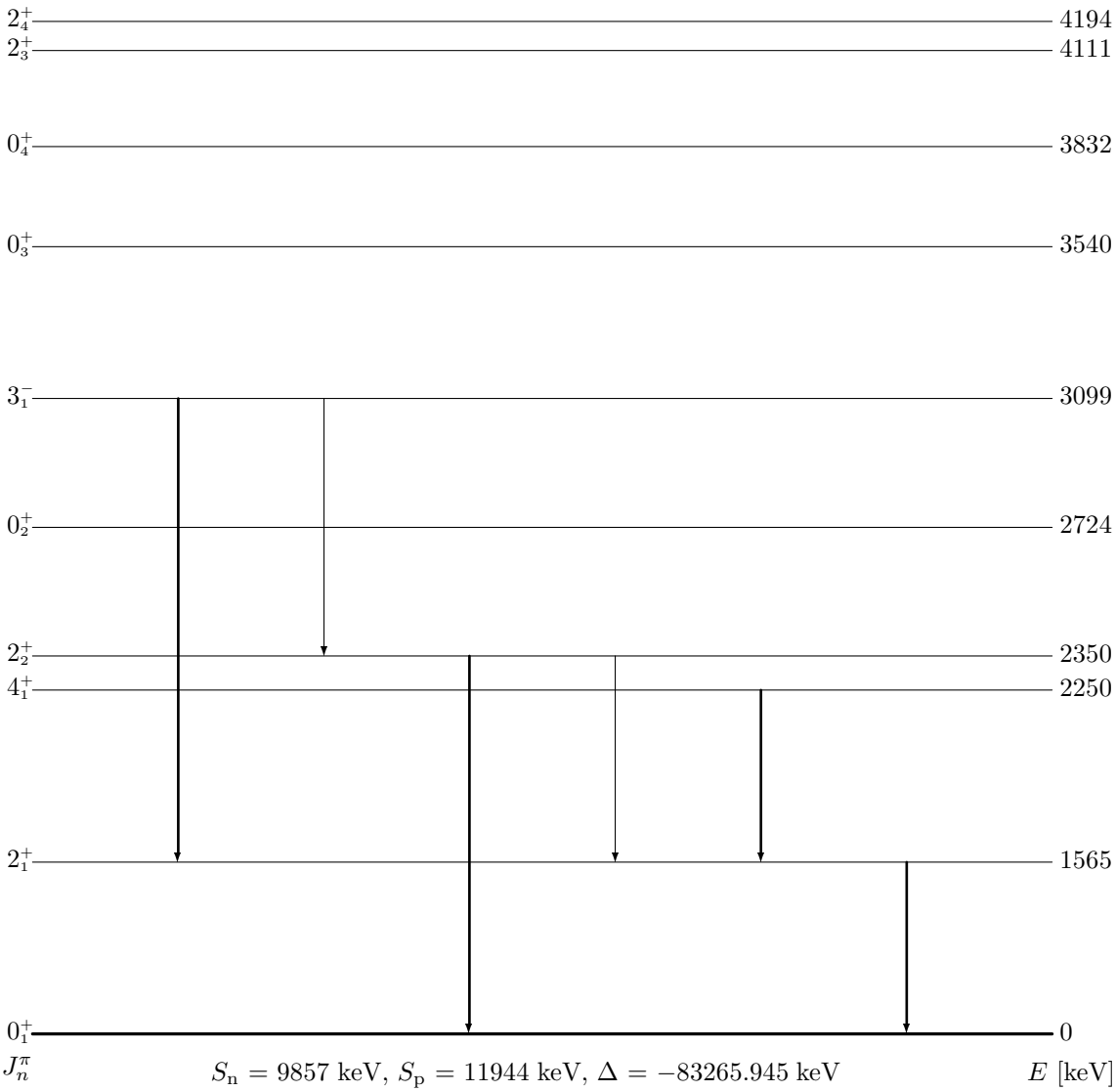
10_2^+ 5449
12_1^+ 5373
10_1^+ 5204
9_1^- 4852
8_2^+ 4719
8_1^- 4388
6_2^+ 3951
1_1^- 3927
7_2^- 3832
7_1^- 3651
6_1^- 3587
5_1^+ 3289
8_1^+ 3236
5_2^- 3219
6_1^+ 3173
2_5^+ 2775
5_1^- 2771
2_4^+ 2759
3_1^- 2700
2_3^+ 2623
4_2^+ 2345
4_1^+ 2095
2_2^+ 1898
0_2^+ 1837
2_1^+ 882
0_1^+ 0
J_n^π
S_n = 10521 keV, S_p = 10711 keV, Δ = −82431.033 keV
E [keV]

J_n^π	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [97T, 98B]
0_1^+	0	stable	log ft = 9.47 (β^- from 2^-), log ft = 9.51 (β^+ from 2^-), Coul. ex., (p,p′)
2_1^+	882	4.35 ps	B(E2→ 0_1^+) = 11.2 W.u., log ft = 7.71 (β^- from 2^-), log ft = 7.11 (β^+ from 2^-), Coul. ex., (p,p′)
0_2^+	1837	25 ps	log ft = 10.90 (β^- from 2^-), (p,p′)
2_2^+	1898	0.30 ps	B(E2→ 2_1^+) = 11 W.u., B(E2→ 0_1^+) = 2.6 W.u., log ft = 7.17 (β^- from 2^-), log ft = 8.09 (β^+ from 2^-)
4_1^+	2095	0.45 ps	B(E2→ 2_1^+) = 22 W.u., log ft = 9.80 (β^- from 2^-), (p,p′)
4_2^+	2345	24 ps	B(E2→ 2_2^+) = 1.61 W.u., B(E2→ 2_1^+) = 0.156 W.u., log ft = 9.20 (β^- from 2^-), (p,p′)
2_3^+	2623	0.28 ps	log ft = 7.46 (β^- from 2^-), (p,p′)
3_1^-	2700	1.7 ps	log ft = 6.77 (β^- from 2^-), (p,p′)
2_4^+	2759		log ft = 7.52 (β^- from 2^-)
5_1^-	2771	7.6 ps	B(E1→ 4_2^+) = 0.00057 W.u., log ft = 5.13 (β^- from $(5^-, 6^-)$)
2_5^+	2775		(p,p′)
6_1^+	3173	2.6 ps	B(E2→ 4_1^+) = 6.9 W.u.
5_2^-	3219	17 ps	(p,p′)
8_1^+	3236	1.89 μs	$\mu = -1.968\ \mu_n$
5_1^+	3289	0.31 ps	
6_1^-	3587	5.5 ps	
7_1^-	3651		
7_2^-	3832	4.9 ps	
1_1^-	3927		log ft = 4.91 (β^- from 2^-), (p,p′)
6_2^+	3951	0.9 ps	
8_1^-	4388	6.7 ps	
8_2^+	4719	5.5 ps	
9_1^-	4852	0.8 ps	
10_1^+	5204	0.14 ps	
12_1^+	5373	43.7 ns	B(E2→ 10_1^+) = 3.7 W.u., $\mu = 2.04\ \mu_n$
10_2^+	5449	3.5 ps	
11_1^-	5902	1.9 ps	



J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [91S, 98B]
$9/2^+_1$	0	10.756 y	$Q = 0.458$ barn, $\mu = -1.0025\ \mu_n$, (d,p), (d,t)
$1/2^-_1$	305	4.480 h	B(M4→ $9/2^+_1$) = 11.1 W.u., log ft = 5.10 (β^- from $3/2^-$), (d,p), (d,t)
$5/2^+_1$	1141	3.5 ps	B(E2→ $9/2^+_1$) = 4 W.u., log ft = 8.00 (β^- from $3/2^-$), (d,p)
$5/2^+_2$	1417	0.42 ps	B(E2→ $9/2^+_1$) = 8 W.u., log ft = 7.25 (β^- from $3/2^-$)
$1/2^+_1$	1431		(d,p)
$3/2^+_1$	2055		(d,p)
$1/2^+_2$	2742		(d,p)
$1/2^+_3$	2866		(d,p)
$3/2^+_2$	3061		(d,p)
$1/2^+_4$	3114		(d,p)
$1/2^+_5$	3154		(d,p)
$1/2^+_6$	3638		(d,p)
$1/2^+_7$	3729		(d,p)
$1/2^+_8$	4146		(d,p)



J^π_n	E [keV]	$T_{1/2}$	B(E(M)λ) and log ft values, moments and main reactions Refs. [97K, 98B]
0^+_1	0	stable	log ft = 9.70 (β^- from (2^-)), log ft = 9.78 (β^+ from 2^-)
2^+_1	1565	0.222 ps	B(E2→ 0^+_1) = 12.1 W.u., log ft = 7.14 (β^- from (2^-)), Coul. ex., (p,p′), (d,d′), (t,α), (d,^{3}He), (t,p)
4^+_1	2250	3.1 ns	B(E2→ 2^+_1) = 0.054 W.u., (p,p′), (d,d′), (t,α), (d,^{3}He), (t,p)
2^+_2	2350		log ft = 7.25 (β^- from (2^-)), (p,p′), (d,d′), (t,α), (d,^{3}He), (t,p)
0^+_2	2724		(p,p′), (t,α), (d,^{3}He), (t,p)
3^-_1	3099		log ft = 7.05 (β^- from (2^-)), (p,p′), (d,d′), (t,α), (t,p)
0^+_3	3540		(p,p′), (t,α), (t,p)
0^+_4	3832		(t,p)
2^+_3	4111		(t,p)
2^+_4	4194		(t,p)

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