

Adopted Levels, Gammas 2004Ti06

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, C. G. Sheu and J. L. Godwin, et al.		NP A745 155 (2004)	31-Mar-2004

$Q(\beta^-)=556.8$ 4; $S(n)=6812.28$ 5; $S(p)=19636.39$ 20; $Q(\alpha)=-7409.52$ 10 [2012Wa38](#)

Note: Current evaluation has used the following Q record 556.0 6 6812.2 6 19636.6 19-7413.3 9 [2003Au03](#).

 ^{10}Be LevelsCross Reference (XREF) Flags

A	$^6\text{Li}(^6\text{He},\alpha^6\text{He}),(^6\text{He},^{10}\text{Be})$	N	$^9\text{Be}(^{11}\text{Be},^{10}\text{Be}\gamma),(^{11}\text{B},^{10}\text{B})$	Others:	
B	$^7\text{Li}(t,\gamma),(t,n),(t,p),(t,t)$	O	$^9\text{Be}(^{14}\text{N},^{13}\text{N})$	AA	$^{12}\text{C}(^6\text{He},^{10}\text{Be})$
C	$^7\text{Li}(^3\text{He},\pi^+)$	P	$^{10}\text{Be}(p,p'),(d,d)$	AB	$^{12}\text{C}(^6\text{Li},^8\text{B})$
D	$^7\text{Li}(\alpha,p)$	Q	$^{10}\text{B}(\gamma,\pi^+)$	AC	$^{12}\text{C}(^9\text{Be},^{11}\text{C})$
E	$^7\text{Li}(^7\text{Li},\alpha),(^7\text{Li},\alpha\gamma)$	R	$^{10}\text{B}(\mu^-, \nu)$	AD	$^{12}\text{C}(^{10}\text{Be},\text{X})$
F	$^9\text{Be}(n,\gamma)$ E=thermal	S	$^{10}\text{B}(\pi^-, \gamma)$	AE	$^{12}\text{C}(^{11}\text{B},^{13}\text{N})$
G	$^9\text{Be}(n,n),(n,n'),(n,2n)$	T	$^{10}\text{B}(n,p),(d,2p)$	AF	$^{12}\text{C}(^{12}\text{Be},\alpha^6\text{He})$
H	$^9\text{Be}(n,p),(n,d),(n,t)$	U	$^{10}\text{B}(t,^3\text{He})$	AG	$^{12}\text{C}(^{12}\text{C},^{10}\text{Be})$
I	$^9\text{Be}(p,\pi^+)$	V	$^{10}\text{B}(^7\text{Li},^7\text{Be})$	AH	$^{12}\text{C}(^{15}\text{N},^{17}\text{F})$
J	$^9\text{Be}(d,p),(d,p\gamma)$	W	$^{11}\text{Li} \beta^- n$ decay	AI	$^{13}\text{C}(t,^6\text{Li})$
K	$^9\text{Be}(\alpha,^3\text{He})$	X	$^{11}\text{Be}(p,d)$	AJ	$^{14}\text{C}(^{18}\text{O},^{22}\text{Ne})$
L	$^9\text{Be}(^7\text{Li},^6\text{Li}),(^8\text{Li},^7\text{Li})$	Y	$^{11}\text{B}(d,^3\text{He})$	AK	$^{11}\text{B}(t,\alpha\gamma)$
M	$^9\text{Be}(^9\text{Be},^8\text{Be})$	Z	$^{11}\text{B}(^7\text{Li},^{10}\text{Be}\gamma)$	AL	$^9\text{Be}(n,\gamma)$ res

E(level)	J ^{π}	T _{1/2}	XREF	Comments
0.0	0 ⁺	1.51×10 ⁶ y 4	AB DEF IJKLMN OPQ STUVWXY Z	XREF: Others: AA, AB, AC, AE, AG, AH, AI, AJ % β^- =100 T=1 T _{1/2} : from weighted average of T _{1/2} =1.51 Ma 6 (Hofmann et al., Nucl. Instrum. Meth. Phys. Res. β 24-25 (1987) 276), T _{1/2} =1.53 Ma 5% (1993Mi26), and T _{1/2} =1.48 Ma 5% (1993Mi26).
3368.03 3	2 ⁺	125 fs 12	ABCDEF IJKLMN OPQRST UVWXYZ	XREF: Others: AA, AB, AC, AE, AG, AH, AI, AJ %IT=100 T=1 B(E2)=52 e ² fm ⁴ 6 (1987Ra01). E(level): from $^9\text{Be}(n,\gamma)$ (1983Ke11). Other value: 3368.34 keV 43 (1999Bu26). $\Gamma_\gamma=3.66\times 10^{-3}$ eV 35.
5958.39 5	2 ⁺	<55 fs	D F JKLM P R TU W Y	XREF: Others: AB, AE, AG, AH, AI %IT=100 T=1 E(level): from $^9\text{Be}(n,\gamma)$ (1983Ke11). Other value: 5958.3 keV 3 (1969Al17).
5959.9 6	1 ⁻		D JKLMNO T Y	XREF: Others: AB %IT=100 T=1 E(level): from $^9\text{Be}(d,p)$ (1969Al17).
6179.3 7	0 ⁺	0.8 ps +3-2	D J W	%IT≈100 T=1 Decay: may also decay by pair production. E(level): from $^9\text{Be}(d,p)$ (1969Al17). Other value: 6070 keV 130 (1973Da09).
6263.3 50	2 ⁻		D JK NO	%IT=100

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Adopted Levels, Gammas 2004Ti06 (continued)

^{10}Be Levels (continued)					
E(level)	J^π	$T_{1/2}$	XREF		Comments
7371 1	3^-	15.7 keV 5	DE G IJKLM	T	T=1 E(level): from $^9\text{Be}(\text{d,p})$ (1969Al17). XREF: Others: AH, AL %IT>0; %n>0
7542 1	2^+	6.3 keV 8	DE G JKL	ST	T=1 E(level): from $^9\text{Be}(\text{n,n})$. XREF: Others: AB, AG %n>0; % α =3.5 12
9270	(4^-)	150 keV 20	DE G JK M O	T	T=1 E(level): from $^9\text{Be}(\text{n,n})$. %n>0
9560 20	2^+	141 [†] keV 10	DE G JKLM	STU Y	T=1 XREF: Others: AB, AD, AE, AG, AH %n>0; % α =0.16 4
10150 20	3^-	296 [†] keV 15	A E L		T=1 E(level): Γ : from $^7\text{Li}(^7\text{Li},\alpha+^6\text{He})$ (1997Cu03, 2001Cu06). Other Γ : 291 keV 20 from $^9\text{Be}(\text{d,p})$. XREF: Others: AD % α >0
10570 30	≥ 1		DE G J		E(level): Γ : from $^7\text{Li}(^7\text{Li},\alpha+^6\text{He})$ (2001Cu06, 2003Fi02). Other value: 10200 100 (2004Ah02, 2004As02). XREF: Others: AH %n>0; % α >0
11230 50		200 [†] keV 80	E		T=1 E(level): from $^9\text{Be}(\text{d,p})$ (1974An27). % α >0
11760 20	(4^+)	121 keV 10	DE IJKLM		E(level): Γ : from $^7\text{Li}(^7\text{Li},\alpha+^6\text{He})$ (2001Cu06, 2003Fi02). XREF: Others: AB, AH % α >0
11.93×10 ³ ? 10	(5^-)	200 [†] keV 80	E		E(level): Γ : from $^9\text{Be}(\text{d,p})$ (1974An27). Other value: 11790 60 (2003As04). XREF: Others: AF % α >0
13.05×10 ³ 10		290 [†] keV 130	E		E(level): Γ : from $^7\text{Li}(^7\text{Li},\alpha+^6\text{He})$ (2001Cu06, 2003Fi02). % α >0
13850 50		330 [†] keV 150	E M		E(level): Γ : from $^7\text{Li}(^7\text{Li},\alpha+^6\text{He})$ (2001Cu06). % α >0
14.68×10 ³ 10		310 [†] keV 140	E		E(level): Γ : from $^7\text{Li}(^7\text{Li},\alpha+^6\text{He})$ (2001Cu06). Other values: 13780 keV 60 from $^9\text{Be}(^9\text{Be},^8\text{Be})$, and 13600 keV 100 from $^{12}\text{C}(^{15}\text{N},^{17}\text{F})$. XREF: Others: AF % α >0
15.30×10 ³ 20	(6^-)	800 keV 200			E(level): Γ : from $^7\text{Li}(^7\text{Li},\alpha+^6\text{He})$ (2001Cu06). XREF: Others: AH
17.12×10 ³ 20	(2^-)	≈150 keV	D		E(level): Γ : from $^{12}\text{C}(^{15}\text{N},^{17}\text{F})$ (2001Bo35). XREF: Others: AF E(level): Γ : from $^7\text{Li}(\alpha,\text{p})$ (1994Ha16).

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Adopted Levels, Gammas 2004Ti06 (continued)

^{10}Be Levels (continued)				
E(level)	J^π	$T_{1/2}$	XREF	Comments
17790		112 keV 35	B DE	%IT>0; %n>0; % ³ H>0; % α >0 E(level): from $^7\text{Li}(^7\text{Li}, \alpha + ^6\text{He})$ (2003FI02), $^7\text{Li}(t, \gamma)$ (1978Su02), $^7\text{Li}(\alpha, p)$ (1994Ha16). Γ : from (2002Li15).
18150 50	(0 ⁻)	90 [†] keV 30	E	% ³ H>0 E(level): from $^7\text{Li}(^7\text{Li}, t + ^7\text{Li})$ (2002Li15, 2003FI02). Γ : from (2002Li15).
18550		310 [†] keV	B DE H	%n>0; % ³ H>0 E(level): from $^7\text{Li}(^7\text{Li}, t + ^7\text{Li})$ (2002Li15). Γ : from (2003FI02).
19800?			E	%p>0 E(level): from $^7\text{Li}(^7\text{Li}, p + ^9\text{Li})$ (2003FI02).
20.80×10 ³ 10			E	% α >0 E(level): from $^7\text{Li}(^7\text{Li}, \alpha + ^6\text{He})$ (2003FI02).
21216 23	(2 ⁻)		B H	%n>0; %p>0; % ³ H>0 T=(2). E(level): Γ : from $^7\text{Li}(t, p)$ (1990Gu36). Γ : sharp.
21.80×10 ³ 10		≈200 [†] keV	E	%p=0; %d>0 E(level): Γ : from $^7\text{Li}(^7\text{Li}, p + ^9\text{Li})$ (2003FI02).
22.40×10 ³ 10		≈250 [†] keV	E H	%n>0; %p>0; % ³ H>0 E(level): Γ : from $^7\text{Li}(^7\text{Li}, p + ^9\text{Li})$ (2003FI02).
23.00×10 ³ 10			E	%p>0 E(level): from $^7\text{Li}(^7\text{Li}, p + ^9\text{Li})$ (2003FI02). Also see $^7\text{Li}(t, X)$ (1990Gu36).
23350 50			E	%n>0; %p>0; %d>0; % ³ H>0; % α >0 E(level): from $^7\text{Li}(^7\text{Li}, \alpha + ^6\text{He})$ (2003FI02).
23650 50			E	%p>0; % ³ H>0; % α >0 E(level): from $^7\text{Li}(^7\text{Li}, \alpha + ^6\text{He})$ (2003FI02).
24.00×10 ³ 10		≈150 [†] keV	E	%d>0; % ³ H>0; % α >0 E(level): Γ : from $^7\text{Li}(^7\text{Li}, \alpha + ^6\text{He})$ (2003FI02).
24250 50		≈200 [†] keV	E	%p>0; %d>0; % ³ H>0; % α >0 E(level): Γ : from $^7\text{Li}(^7\text{Li}, \alpha + ^6\text{He})$ (2003FI02).
24.60×10 ³ 10		≈150 [†] keV	E	%p>0; %d>0 E(level): Γ : from $^7\text{Li}(^7\text{Li}, p + ^9\text{Li})$ (2003FI02).
24.80×10 ³ 10		≈100 [†] keV	E	%p>0; %d>0 E(level): Γ : from $^7\text{Li}(^7\text{Li}, p + ^9\text{Li})$ (2003FI02).
25.05×10 ³ 10		≈150 [†] keV	E	%d>0; % α >0 E(level): Γ : from $^7\text{Li}(^7\text{Li}, \alpha + ^6\text{He})$ (2003FI02).
25.60×10 ³ 10			E	%p>0; %d>0; % α >0 E(level): from $^7\text{Li}(^7\text{Li}, \alpha + ^6\text{He})$ (2003FI02).
25950 50		≈300 [†] keV	E	%d>0 E(level): Γ : from $^7\text{Li}(^7\text{Li}, d + ^8\text{Li})$ (2003FI02).
26.30×10 ³ 10		≈100 [†] keV	E	%d>0; % ³ H>0 E(level): Γ : from $^7\text{Li}(d + ^8\text{Li})$ (2003FI02).
26.80×10 ³ 10			E	%p>0; %d>0; % α >0 E(level): from $^7\text{Li}(^7\text{Li}, \alpha + ^6\text{He})$ (2003FI02).
27.20×10 ³ 20			E	%p>0; %d>0; % ³ H>0; % α >0 E(level): from $^7\text{Li}(^7\text{Li}, \alpha + ^6\text{He})$ (2003FI02).

[†] Not corrected for experimental system resolution and therefore upper limits.

Adopted Levels, Gammas 2004Ti06 (continued)

$\gamma(^{10}\text{Be})$							Comments
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	I_γ	E_f	J_f^π	Mult.	
3368.03	2 ⁺	3367.415 30	100	0.0	0 ⁺	E2	$\Gamma_\gamma=3.66\times 10^{-3}$ eV 35; B(E2)(W.u.)=8.00 76
5958.39	2 ⁺	2589.999 60	>90	3368.03	2 ⁺	M1	
		5955.9 5	<10	0.0	0 ⁺	E2	
5959.9	1 ⁻	2591.5 6	17 8	3368.03	2 ⁺	E1	Uncertainties in branching ratios are asymmetric: 17 +6-10 and 83 +10-6; from (d,p).
		5958.0 6	83 8	0.0	0 ⁺	E1	
6179.3	0 ⁺	219.4 3	24 2	5959.9	1 ⁻	E1	$\Gamma_\gamma=1.44\times 10^{-4}$ eV 53; B(E1)(W.u.)=4.3 $\times 10^{-2}$ 16
		2811 7	76 2	3368.03	2 ⁺	E2	
		6178		0.0	0 ⁺	E0	$\Gamma_\gamma=4.5\times 10^{-4}$ eV 17; B(E2)(W.u.)=2.5 9
6263.3	2 ⁻	303.4 50	≤ 1	5959.9	1 ⁻		
		2894.9 50	99 1	3368.03	2 ⁺	E1	
		6261.2 50	1 1	0.0	0 ⁺	M2	
7371	3 ⁻	1412	15 11	5958.39	2 ⁺	E1	$\Gamma_\gamma=0.11$ eV 8; B(E2)(W.u.)=1.2 $\times 10^{-1}$ 9 Γ_γ from (1994Ki09).
		4002	85 8	3368.03	2 ⁺	E1	
							$\Gamma_\gamma=0.62$ eV 6; B(E2)(W.u.)=3.1 $\times 10^{-2}$ 3 Γ_γ from (1994Ki09).

[†] From level energy difference; recoil correction applied.

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Level Scheme

Intensities: % photon branching from each level

