

Adopted Levels, Gammas

Type	Author	Citation	Literature Cutoff Date
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$Q(\beta^-) = -17979.9$ 10; $S(n) = 18898.64$ 8; $S(p) = 17254.40$ 4; $Q(\alpha) = 91.84$ 4 [2012Wa38](#)

Note: Current evaluation has used the following Q record -17979.8 1018899.681217255.44 9 91.84 4 [2003Au02](#).

See also table 8.10: electromagnetic transitions in ${}^8\text{Be}$ ([2004Ti06](#)) and reaction: ${}^4\text{He}(\alpha, \alpha)$.

 ${}^8\text{Be}$ LevelsCross Reference (XREF) Flags

A	${}^8\text{Li } \beta^-$ decay	L	${}^7\text{Li}(p, \gamma)$	W	${}^9\text{Be}({}^3\text{He}, \alpha)$
B	${}^8\text{B } \beta^+$ decay	M	${}^7\text{Li}(p, n)$	X	${}^{10}\text{Be}(p, t)$
C	${}^4\text{He}(\alpha, \gamma)$	N	${}^7\text{Li}(p, p), {}^7\text{Li}(p, p')$	Y	${}^{10}\text{B}(p, {}^3\text{He})$
D	${}^4\text{He}(\alpha, \alpha)$	O	${}^7\text{Li}(p, \alpha)$	Z	${}^{10}\text{B}(d, \alpha)$
E	${}^6\text{Li}(d, \gamma)$	P	${}^7\text{Li}(d, n)$	Others:	
F	${}^6\text{Li}(d, n), {}^6\text{Li}(d, p)$	Q	${}^7\text{Li}({}^3\text{He}, d), {}^7\text{Li}({}^3\text{He}, d\alpha)$	AA	${}^{11}\text{B}({}^3\text{He}, {}^6\text{Li})$
G	${}^6\text{Li}(d, \alpha), {}^6\text{Li}(d, p\alpha)$	R	${}^7\text{Li}(\alpha, t)$	AB	${}^{12}\text{C}(d, {}^6\text{Li})$
H	${}^6\text{Li}(t, n)$	S	${}^7\text{Li}({}^7\text{Li}, {}^6\text{He})$	AC	${}^{12}\text{C}({}^3\text{He}, {}^7\text{Be})$
I	${}^6\text{Li}({}^3\text{He}, p)$	T	${}^7\text{Be}(n, p)$	AD	${}^{12}\text{C}(\alpha, 2\alpha), {}^{12}\text{C}(\alpha, {}^8\text{Be})$
J	${}^6\text{Li}(\alpha, d), {}^6\text{Li}(\alpha, 2\alpha)$	U	${}^9\text{Be}(p, d), {}^9\text{Be}(p, np)$	AE	$\alpha\gamma({}^{14}\text{N}, {}^8\text{Be})$
K	${}^6\text{Li}({}^6\text{Li}, \alpha)$	V	${}^9\text{Be}(d, t)$	AF	${}^9\text{C } \beta^+ p$ decay

E(level)	J^π	$T_{1/2}$	XREF								Comments
0.0	0^+	5.57 eV 25	ABCDE	HIJKL	PQRS	UVW	YZ	XREF: Others: AA , AB , AC , AD , AE , AF			$\% \alpha = 100$ $T = 0$ Γ : From ${}^4\text{He}(\alpha, \alpha)$ (1992Wa09). Previous value $\Gamma = 6.8$ eV 17 (1968Be02). Other value $\Gamma = 5.5$ eV 13 ${}^9\text{Be}(p, d)$.
3030 10	2^+	1513 keV 15	ABCDE	HIJKL	PQRS	UVW	YZ	XREF: Others: AA , AB , AC , AD , AF			$\% \alpha \approx 100$ $T = 0$ E(level): see 2004Ti06 table 8.11.
11.35×10^3 15	4^+	≈ 3.5 MeV	CD	JK	P R	UVW	Z	XREF: Others: AB , AC , AD			$\% \alpha \approx 100$ $T = 0$ E(level): values in the literature are 11.4 MeV 3 ${}^4\text{He}(\alpha, \alpha)$ (1959Br71), 11.7 MeV 4 ${}^4\text{He}(\alpha, \alpha)$ (1974Ch45), 11.3 MeV 4 ${}^6\text{Li}(\alpha, d)$ (1962Ce01), 11.3 MeV 2 ${}^7\text{Li}(d, n)$ (1995Ar25), 11.40 MeV 5 ${}^7\text{Li}(d, n)$ (1969Ho11) and 11.3 MeV 3 ${}^9\text{Be}(p, d)$ (1969Su02), Γ : Values found in the literature are 4.0 MeV 4 ${}^4\text{He}(\alpha, \alpha)$ (1974Ch45), ≈ 4.3 MeV ${}^4\text{He}(\alpha, \alpha)$ (1967Ke10), 3.7 MeV 2 ${}^7\text{Li}(d, n)$ (1995Ar25), 2.8 MeV 2 ${}^7\text{Li}(d, n)$ (1969Ho11), 5.2 MeV 1 ${}^9\text{Be}(p, d)$ (1981Be53) ≈ 2.6 MeV ${}^9\text{Be}({}^3\text{He}, \alpha)$ (1966Ca13 , 1967Ca13) and ≈ 4 MeV ${}^{10}\text{B}(d, \alpha)$ (1966Lo18 , 1968Lo01).
16626 3	2^+	108.1 keV 5	BCD	HI KL	PQR	UVW	YZ	XREF: Others: AA , AB , AC			$\% \text{IT} < 2.65 \times 10^{-3}$; $\% \alpha \approx 100$

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Adopted Levels, Gammas (continued) ${}^8\text{Be}$ Levels (continued)

E(level)	J ^π	T _{1/2}	XREF							Comments
16922 3	2 ⁺	74.0 keV 4	CD	HI	KL	PQR	UVW	YZ		T=0&1 E(level): from weighted average of E=16627 keV 5 ${}^7\text{Li}({}^3\text{He},\text{d})$, 16623 keV 3 ${}^4\text{He}(\alpha,\alpha)$ and 16630 keV 3 ${}^4\text{He}(\alpha,\alpha)$. Γ: From weighted average of Γ=113 keV 3 ${}^7\text{Li}({}^3\text{He},\text{d})$, 90 keV 5 ${}^{10}\text{B}(\text{d},\alpha)$, 107.7 keV 5 ${}^4\text{He}(\alpha,\alpha)$ and 108.5 keV 5 ${}^4\text{He}(\alpha,\alpha)$. XREF: Others: AA, AB, AC %IT<3.89×10 ⁻³ ; %α≈100 T=0&1 E(level): from weighted average of E=16901 keV 5 ${}^7\text{Li}({}^3\text{He},\text{d})$, 16925 keV 3 ${}^4\text{He}(\alpha,\alpha)$ and 16918 keV 3 ${}^4\text{He}(\alpha,\alpha)$. Γ: From weighted average of Γ=77 keV 3 ${}^7\text{Li}({}^3\text{He},\text{d})$, 70 keV 5 ${}^{10}\text{B}(\text{d},\alpha)$, 74.4 keV 4 ${}^4\text{He}(\alpha,\alpha)$ and 73.6 keV 4 ${}^4\text{He}(\alpha,\alpha)$. XREF: Others: AA, AC %IT=0.204; %p=99.8 T=1 E(level): from ${}^7\text{Li}(\text{p},\gamma)$. Γ: From ${}^7\text{Li}(\text{p},\gamma)$. XREF: Others: AA %IT=4.6×10 ⁻³ ; %p≈100 T=0 E(level): from weighted average of E=18155 keV 5 ${}^7\text{Li}(\text{p},\text{p}'\gamma)$, 18150 keV 5 ${}^{10}\text{B}(\text{d},\alpha)$ and 18144 keV 5 ${}^9\text{Be}(\text{d},\text{t})$. Γ: From ${}^{10}\text{B}(\text{d},\alpha)$. %IT=2.2×10 ⁻⁴ ; %n=?; %p=? Γ: From R-matrix fit to ${}^7\text{Be}(\text{n},\text{p})$, (n,α) and (n,αγ) data. Other values are Γ=131 keV 44 ${}^7\text{Li}(\text{p},\gamma)$, 50 keV 20 ${}^7\text{Li}(\text{p},\text{n})$ and 48 keV 18 ${}^7\text{Li}(\text{p},\text{p})$. %IT=3.87×10 ⁻³ ; %p≈100 T=1 T: Tentative. E(level): from weighted average of E=19060 keV 20 ${}^7\text{Li}(\text{p},\gamma)$ and 19071 keV 10 ${}^9\text{Be}(\text{d},\text{t})$. Γ: From weighted average of Γ=271 keV 17 ${}^7\text{Li}(\text{p},\gamma)$ and 270 keV 30 ${}^9\text{Be}(\text{d},\text{t})$. XREF: Others: AE %n≈50; %p≈50 T=0 T: Tentative. E(level): from weighted average of E=19220 keV 30 ${}^9\text{Be}({}^3\text{He},\alpha)$, 19260 keV 30 ${}^9\text{Be}(\text{d},\text{t})$ and 19234 keV 12 Ag(${}^{14}\text{N}$, ${}^8\text{Be}$). Γ: From weighted average of Γ=208 keV 30 ${}^9\text{Be}(\text{p},\text{d})$, 265 keV 30 ${}^9\text{Be}({}^3\text{He},\alpha)$, 220 keV 30 ${}^9\text{Be}(\text{d},\text{t})$ and 210 keV 35 Ag(${}^{14}\text{N}$, ${}^8\text{Be}$). Branching ratio from ${}^7\text{Li}(\text{p},\text{n})$. %n=?; %p=? Γ: From ${}^7\text{Li}(\text{p},\text{p}), (\text{p},\text{p}')$. %p=30; %α=70 T=0
17640.0 10	1 ⁺	10.7 keV 5	E	I	L	N	PQ	UVW	Z	
18150 4	1 ⁺	138 keV 6		I	L	N	PQ	UV	Z	
18910	2 ⁻	122 keV	I	LMN	P			T		
19069 10	3 ⁺	271 keV 15	I	L	N	P		UV		
19235 10	3 ⁺	227 keV 16		MN	P			TUVW	Z	
19400	1 ⁻	≈645 keV	I	MN				U		
19860 50	4 ⁺	0.7 MeV 1	D	I	K	O	RS	VW	Z	

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Adopted Levels, Gammas (continued)

⁸ Be Levels (continued)									
E(level)	J ^π	T _{1/2}	XREF					Comments	
									Γα/Γ _p =2.3 5 ¹⁰ B(d,2α), ¹⁰ B(d,p+ ⁷ Li)(1992Pu06). Other measurement Γα/Γ=0.96 from ⁴ He(α,α). E(level): from ⁹ Be(d,t). Γ: From ⁹ Be(d,t). %n=?; %p=?; %α=? T=0
20100	2 ⁺	880 keV 20	D	MNOP	S	V	Z		Γα/Γ _p =4.5 6 ¹⁰ B(d,α), ¹⁰ B(d,p)(1992Pu06). Γ: From ⁷ Li(d,n). %α≈50; %n=? T=0 Γ: From ⁷ Li(d,n).
20200	0 ⁺	720 keV 20	D	M	P		Z		Γα/Γ≈0.50 ⁴ He(α,α). %p=? Γ: From ⁷ Li(p,p). %IT=?; %n=?; %p=? Γ: From ⁷ Li(p,n).
20.9×10 ³	4 ⁻	1.6 MeV 2		N					%IT=?; %p=? T=1 Γ: From ⁷ Li(p,γ).
21.5×10 ³	3 ⁽⁺⁾	1.1 MeV		LM		T	Z		E(level): from ⁹ Be(³ He,α). Γ: From ⁹ Be(³ He,α).
22000 [†]	1 ⁻	≈4 MeV		L					%n=?; %p=?; %d=?; %α=? T=0 E(level): from ⁶ Li(d,α) (1997Cz01). Γ: From ⁶ Li(d,α) (1965Fr02).
22.05×10 ³ 10		270 keV 70				U	W		E(level): from ⁹ Be(³ He,α). Γ: From ⁹ Be(³ He,α).
22.24×10 ³ 2	2 ⁺	≈0.8 MeV	D	G	MNO		Z		E(level): from ⁹ Be(³ He,α). Γ: From ⁹ Be(³ He,α).
22.63×10 ³ 10		100 keV 50		K			W		%IT=?; %p=?; %α=? T=1 Γ: From ⁷ Li(p,γ).
22.98×10 ³ 10		230 keV 50					W		%p=?; %d=?; %α=? T=0 %d=?; %α=? T=0 Γ: Broad.
24000 [†]	(1,2) ⁻	≈7 MeV		L	O		Z		%IT=0.60; %n=39.4; %p=6.9; %d=27.0; % ³ H=11.7; % ³ He=6.6; %α=7.9 T=2 E(level): from weighted average of E=27492.2 keV 26 ¹⁰ B(p, ³ He) (1975Ro01) and 27495.8 keV 24 ⁶ Li(d,γ) (1976No07).
25200	2 ⁺		D	G	O		Z		Γ: From ⁶ Li(d,γ). Other values are Γ=10 keV 3 ⁶ Li(d,p),(d,d),(d,α) (1969B114), 14.7 keV 40 ⁴ He(α,α),(α,p) (1976Hi04) and 12.3 keV 3 ¹⁰ B(p, ³ He) (1975Ro01).
25500	4 ⁺		D	G					E(level): for parameters of this state see (1979Fr04). However, the sum of the branching ratios given in (1979Fr04) greatly exceeds 100%. %IT=?; %p=? 28600?
27494.1 18	0 ⁺	5.5 keV 20	EFG				X		
28600?				L					

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Adopted Levels, Gammas (continued) ${}^8\text{Be}$ Levels (continued)

E(level)	$T_{1/2}$	XREF	Comments
$32 \times 10^3?$	1 MeV		Γ : Broad. Z E(level): from ${}^{10}\text{B}(\text{d},\alpha)$ (1993Pa31). Γ : From ${}^{10}\text{B}(\text{d},\alpha)$ (1993Pa31).
$\approx 41 \times 10^3?$		G	

† Giant resonance: see reaction ${}^7\text{Li}(\text{p},\gamma)$.

 $\gamma({}^8\text{Be})$

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	E_f	J_f^π	Mult.	δ	Comments
3030	2^+	3029	0.0	0^+	E2		Γ_γ : 8.3×10^{-3} eV (calculated in 1986La05).
11.35×10^3	4^+	11350	0.0	0^+	E4		Γ_γ : 0.46×10^{-3} eV (calculated in 1986La05).
16626	2^+	13580	3030	2^+	M1		$\Gamma_\gamma < 2.80$ eV 18; B(M1)(W.u.) $< 5.3 \times 10^{-2}$ 3
		16607	0.0	0^+	E2		$\Gamma_\gamma = 7.0 \times 10^{-2}$ eV 25; B(E2)(W.u.) $= 7.1 \times 10^{-2}$ 25
16922	2^+	13879	3030	2^+	M1		$\Gamma_\gamma < 2.80$ eV 18; B(M1)(W.u.) $< 5.3 \times 10^{-2}$ 3
		16903	0.0	0^+	E2		$\Gamma_\gamma = 8.4 \times 10^{-2}$ eV 14; B(E2)(W.u.) $= 7.8 \times 10^{-2}$ 13
17640.0	1^+	718	16922	2^+	M1		$\Gamma_\gamma = 1.3 \times 10^{-3}$ eV 3; B(M1)(W.u.) $= 0.17$ 4
		1014	16626	2^+	M1+E2	-0.014 13	$\Gamma_\gamma = 3.2 \times 10^{-2}$ eV 3; B(M1)(W.u.) $= 1.5$ 2
		14586	3030	2^+	M1+E2	0.21 4	$\Gamma_\gamma = 6.8$ eV 13; B(M1)(W.u.) $= 0.10$ 2; B(E2)(W.u.) $= 0.23$ 10
		17619	0.0	0^+	M1		$\Gamma_\gamma = 15.0$ eV 18; B(M1)(W.u.) $= 0.13$ 2
18150	1^+	1228	16922	2^+	M1		$\Gamma_\gamma = 6.2 \times 10^{-2}$ eV 7; B(M1)(W.u.) $= 1.6$ 2
		1524	16626	2^+	M1		$\Gamma_\gamma = 7.7 \times 10^{-2}$ eV 19; B(M1)(W.u.) $= 1.0$ 3
		15095	3030	2^+	M1		$\Gamma_\gamma = 4.3$ eV 12; B(M1)(W.u.) $= 5.9 \times 10^{-2}$ 17
		18128	0.0	0^+	M1		$\Gamma_\gamma = 1.9$ eV 4; B(M1)(W.u.) $= 1.5 \times 10^{-2}$ 3
18910	2^-	1988	16922	2^+	E1		$\Gamma_\gamma = 9.9 \times 10^{-2}$ eV 43; B(E1)(W.u.) $= 4.6 \times 10^{-2}$ 20
		2284	16626	2^+	E1		$\Gamma_\gamma = 0.17$ eV 7; B(E1)(W.u.) $= 5.3 \times 10^{-2}$ 20
19069	3^+	16013	3030	2^+	M1		$\Gamma_\gamma = 10.5$ eV; B(M1)(W.u.) $= 0.122$
27494.1	0^+	9847.6	17640.0	1^+	M1		$\Gamma_\gamma = 21.9$ eV 39; B(M1)(W.u.) $= 1.10$ 20
							Γ_γ : From (1979Fr04). Revised from $\Gamma_\gamma = 24$ eV 3 (1976No07).

† From E(level) difference; recoil correction applied.

Adopted Levels, GammasLevel Scheme