

Adopted Levels

Type	Author	History	Citation	Literature Cutoff Date
Update	J. H. Kelley, J. L. Godwin, C. G. Sheu		ENSDF	31-Mar-2004

$Q(\beta^-)=10663.88$ 10; $S(n)=2535$ 8; $S(p)=2.48\times 10^4$ *sys* 2012Wa38

Note: Current evaluation has used the following Q record 10651. 7 2574 18

2003Au02.

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

A	${}^1\text{H}({}^8\text{He}, {}^8\text{He})$	F	${}^{10}\text{Be}({}^{12}\text{C}, {}^{14}\text{O})$
B	${}^9\text{Be}(\pi^-, p)$	G	${}^{11}\text{B}(\pi^-, pd)$
C	${}^9\text{Be}({}^7\text{Li}, {}^8\text{B})$	H	${}^{11}\text{B}({}^7\text{Li}, {}^{10}\text{C})$
D	${}^9\text{Be}({}^9\text{Be}, {}^{10}\text{C})$	I	${}^{12}\text{C}({}^8\text{He}, {}^6\text{He}2n)$
E	${}^9\text{Be}({}^{13}\text{C}, {}^{14}\text{O})$		

E(level)	J^π	$T_{1/2}$	XREF	Comments
0.0	0^+	119.1 ms 12	ABCDEF GH	<p>$\% \beta^- = 100$; $\% \beta^- n = 16$ 1</p> <p>$T=2$</p> <p>$T_{1/2}$: from weighted average of $T_{1/2}=117.5$ ms 15 (1981Bj03), and $T_{1/2}=122$ ms 2 (1965Po06). These values are averaged to obtain $T_{1/2}=119$ ms 1 (1981Bj01) and $T_{1/2}=119.0$ ms 1.5 (2004Ti06, 2003Au02). Other values are $T_{1/2}=841$ ms 4 (1954Kl36), $T_{1/2}=848$ ms 5 (1960Ja12), $T_{1/2}=844.0$ ms 7 (1966C102), $T_{1/2}=854$ ms 8 (1968Da12) and $T_{1/2}=838$ ms 6 (1971Wi05).</p> <p>$\% \beta^- n$: From (1981Bj01), other value $\% \beta^- n = 12$ 1 (1965Po06). 32 3% of $\beta^- n$ neutrons populate ${}^7\text{Li}^*(478)$ (1981Bj01).</p> <p>$\% \beta^- {}^3\text{H} = 0.9$ 1 (2003Au02, 1986Bo41).</p>
3.1×10^3 5	2^+	0.6 MeV 2	A CDEF HI	<p>$\% n \approx 100$; $\% \alpha \leq 5$</p> <p>$T=2$</p> <p>E(level): values in the literature are discrepant. Five independent values are $E=3.55$ MeV 15 ${}^1\text{H}({}^8\text{He}, {}^8\text{He})$ (1995Ko27), 2.80 MeV 20 ${}^9\text{Be}({}^7\text{Li}, {}^8\text{B})$ (1985Al29), 2.70 MeV 30 ${}^9\text{Be}({}^9\text{Be}, {}^{10}\text{C})$ and ${}^{11}\text{B}({}^7\text{Li}, {}^{10}\text{C})$ (1988Be34), 3.59 MeV ${}^9\text{Be}({}^{13}\text{C}, {}^{14}\text{O})$ (1995Vo05), 2.90 MeV 20 ${}^{12}\text{C}({}^8\text{He}, 6\text{He}2n)$ (2001Ma05). The value $E=3.1$ MeV is obtained from the average of the measured values. The uncertainty is assigned by the evaluator.</p> <p>Γ: The Γ is obtained from the weighted average of $\Gamma=0.50$ MeV 35 ${}^1\text{H}({}^8\text{He}, {}^8\text{He})$ (1995Ko27), 0.5 MeV 3 ${}^9\text{Be}({}^9\text{Be}, {}^{10}\text{C})$ (1988Be34), 0.8 MeV (3) ${}^9\text{Be}({}^{13}\text{C}, {}^{14}\text{O})$ (1995Vo05), 1.0 MeV 5 ${}^{11}\text{B}({}^7\text{Li}, {}^{10}\text{C})$ (1988BeYJ), 0.3 MeV 3 ${}^{12}\text{C}({}^8\text{He}, 6\text{He}2n)$ (2001Ma05).</p>
4.36×10^3 20	(1^-)	1.3 MeV 5	B D FGHI	<p>$\% n \approx 100$</p> <p>E(level): independent values in the literature are $E=4.40$ MeV 20 ${}^9\text{Be}(\pi^-, p)$ (1998Go30), 4.00 MeV 30 ${}^9\text{Be}({}^9\text{Be}, {}^{10}\text{C})$ and ${}^{11}\text{B}({}^7\text{Li}, {}^{10}\text{C})$ (1988Be34), 4.54 MeV 15 ${}^{10}\text{Be}({}^{12}\text{C}, {}^{14}\text{O})$ (1999Bo26), 4.40 MeV 40 ${}^{11}\text{B}(\pi^-, p+D)$ (1998Go30), 4.15 MeV 20 ${}^{12}\text{C}({}^8\text{He}, 6\text{He}2n)$ (2001Ma05). The energy is obtained from the weighted average of these values. However, the uncertainty is obtained by doubling the value obtained in the weighting formula.</p> <p>This state may represent a group of levels. A broad resonance is observed at 4.4 MeV in ${}^9\text{Be}(\pi^-, p)$, ${}^{11}\text{B}(\pi^-, p)$ and ${}^{12}\text{C}({}^8\text{He}, 6\text{He}2n)$; a narrow resonance is observed at 4 MeV in ${}^9\text{Be}({}^9\text{Be}, {}^{10}\text{C})$ and ${}^{11}\text{B}({}^7\text{Li}, {}^{10}\text{C})$ and a narrow resonance is observed at 4.54 MeV in ${}^{10}\text{Be}({}^{12}\text{C}, {}^{14}\text{O})$.</p> <p>$\Gamma$: The Γ is obtained from the weighted average of $\Gamma=1.8$ MeV 2 ${}^9\text{Be}(\pi^-, p)$ (1998Go30), 0.5 MeV 3 ${}^9\text{Be}({}^9\text{Be}, {}^{10}\text{C})$ and ${}^{11}\text{B}({}^7\text{Li}, {}^{10}\text{C})$</p>

Continued on next page (footnotes at end of table)

Adopted Levels (continued) ${}^8\text{He}$ Levels (continued)

<u>E(level)</u>	<u>J^{π}</u>	<u>T_{1/2}</u>	<u>XREF</u>	<u>Comments</u>
				%n \approx 100
				E(level): independent values in the literature are E=4.40 MeV 20 ${}^9\text{Be}(\pi^-, \text{p})$ (1998Go30), 4.00 MeV 30 ${}^9\text{Be}({}^9\text{Be}, {}^{10}\text{C})$ and ${}^{11}\text{B}({}^7\text{Li}, {}^{10}\text{C})$ (1988Be34), 4.54 MeV 15 ${}^{10}\text{Be}({}^{12}\text{C}, {}^{14}\text{O})$ (1999Bo26), 4.40 MeV 40 ${}^{11}\text{B}(\pi^-, \text{p}+\text{D})$ (1998Go30), 4.15 MeV 20 ${}^{12}\text{C}({}^8\text{He}, 6\text{he}2\text{n})$ (2001Ma05). The energy is obtained from the weighted average of these values. However, the uncertainty is obtained by doubling the value obtained in the weighting formula.
				This state may represent a group of levels. A broad resonance is observed at 4.4 MeV in ${}^9\text{Be}(\pi^-, \text{p})$, ${}^{11}\text{B}(\pi^-, \text{p})$ and ${}^{12}\text{C}({}^8\text{He}, 6\text{he}2\text{n})$; a narrow resonance is observed at 4 MeV in ${}^9\text{Be}({}^9\text{Be}, {}^{10}\text{C})$ and ${}^{11}\text{B}({}^7\text{Li}, {}^{10}\text{C})$ and a narrow resonance is observed at 4.54 MeV in ${}^{10}\text{Be}({}^{12}\text{C}, {}^{14}\text{O})$.
				Γ : The Γ is obtained from the weighted average of $\Gamma=1.8$ MeV 2 ${}^9\text{Be}(\pi^-, \text{p})$ (1998Go30), 0.5 MeV 3 ${}^9\text{Be}({}^9\text{Be}, {}^{10}\text{C})$ and ${}^{11}\text{B}({}^7\text{Li}, {}^{10}\text{C})$ (1988Be34), 0.70 MeV 25 ${}^{10}\text{Be}({}^{12}\text{C}, {}^{14}\text{O})$ (1999Bo26), 1.2 MeV 2 ${}^{11}\text{B}(\pi^-, \text{p})$ (1998Go30), 0.5 MeV 3 ${}^{11}\text{B}({}^7\text{Li}, {}^{10}\text{C})$ (Belousov et al., Sov.Phys. Lebedev Inst. Rept. No. 9 (1987) 203) and 1.6 MeV 2 ${}^{12}\text{C}({}^8\text{He}, 6\text{he}2\text{n})$ (2001Ma05). The uncertainty is estimated by the evaluator.
6.03 $\times 10^3$? 10		0.15 MeV 15	F	
7.16 $\times 10^3$ 4	(3 ⁻)	0.1 MeV 1	C F	E(level): see reactions: ${}^9\text{Be}({}^9\text{Be}, {}^{10}\text{C})$, ${}^{11}\text{B}({}^7\text{Li}, {}^{10}\text{C})$ in 1988Aj01 for possible evidence of other states in ${}^8\text{He}$ and the results of nuclear model calculations.

Adopted Levels 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

$Q(\beta^-)=1.612\times 10^4$ 10; $S(n)=-1.7\times 10^2$ 11 2012Wa38

Note: Current evaluation has used the following Q record 15759 71 -969 92

2003Au03,2004Ti06.

 ^{10}He LevelsCross Reference (XREF) Flags

A $^1\text{H}(^{11}\text{Li},2\text{p})$
 B $^2\text{H}(^{11}\text{Li},^{10}\text{He})$
 C $^{10}\text{Be}(^{14}\text{C},^{14}\text{O})$

E(level)	J^π	$T_{1/2}$	XREF	Comments
0.0	(0 ⁺)	300 keV 200	ABC	%n=100 T=3 E(level): Γ : from $^{10}\text{Be}(^{14}\text{C},^{14}\text{O})$ (1994Os04). Decay: unstable to one and two neutron-decay.
32.4×10^2 † 20	(2 ⁺)	1000 keV 300	C	T=3 E(level): Γ : from $^{10}\text{Be}(^{14}\text{C},^{14}\text{O})$ (1994Os04).
6800† 70	(3 ⁻)	600 keV 300	C	T=3 E(level): Γ : from $^{10}\text{Be}(^{14}\text{C},^{14}\text{O})$ (1994Os04).

† Decay mode not specified.