Adopted Levels, Gammas 2002Ti10

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Hu, Tilley, Kelley, Godwin et al.	NP A708,3 (2002)	23-Aug-2001

Q(β^-)=−1.191×10^4 *3*; S(n)=10677 *6*; S(p)=5606.85 *7*; Q(α)=−1587.13 *7* 2012Wa38
Note: Current evaluation has used the following Q record −12101. 70 *10676* 5 *5605*.8 *7* −1586.6 *5* 1995Au04.

^{7}Be Levels

Cross Reference (XREF) Flags

A	^{4}He(^{3}He,^{3}He),(^{3}He,p)	E	^{6}Li(α,t)	I	^{9}Be(p,t)
B	^{6}Li(p,p),(p,2p),(p,pα)	F	^{7}Li(p,n)	J	^{10}B(p,α)
C	^{6}Li(d,n)	G	^{7}Li(^{3}He,t)		
D	^{6}Li(^{3}He,d)	H	^{7}Li(^{6}Li,^{6}He)		

E(level)	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0	3/2$^-$	53.22 d *6*	CDEFGHIJ	%ε=100 T=1/2 T$_{1/2}$: The ^{7}Be half-life has been observed to vary depending on the chemical form of the ^{7}Be. Some of these measured variations are: Reference Forms compared ($\Delta\lambda$x1.0e^4)/λ. 1949Se20 Be − BeO 1.5 (9). 1953Kr16 Be − BeO 1.3 (5). BeO- BeF_2 6.1 (6). Be − BeF_2 7.4 (5). 1956Bo36 Be − BeF_2 12 (1). 1970Jo21 BeO- BeF_2 11.3 (6). BeO- $BeBr_2$ 14.7 (6). BeO- $Be_4O(CH_3COO)_6$ −7.2 (6). BeO- $Be(C_5H_5)_2$ 8.0 (7). BeO- $Be(OH_2)_4$ −3.7 (8). BeF_2- $Be_4O(CH_3COO)_6$ −18.5 (8). $Be(C_5H_5)_2$- $Be(OH_2)_4$ −11.7 (11). 1999Hu20 BeO − $Be(OH)_2$ −149. BeO − $Be^{2+}(OH_2)_4$ −98. 1992Ra12 Be in Au − Be in Al_2O_3 72. (7). Excluding the much larger changes reported by 1999Hu20 and 1999Ra12, these measured changes range from 0.01% to 0.2%, or from 0.005 to 0.10 days, or 0.08 day if the organic compounds are also omitted. T$_{1/2}$: Adopted 53.22 d 6 from Limitation of Relative Statistical Weight (LRSW) (1985ZiZY, 1992Ra09) analysis of 53 d *2* (1940hi01), 52.93 d *22* (1949Se20), 53.61 d *17* (1953Kr16), 53.0 d *4* (1956Bo36), 53.5 d *2* (1957Wr37), 53.1 d *3* (1965En01), 53.52 d *10* (1970Jo21), 53.0 d *3* (1974Cr05), 53.17 d *2* (1975La16), 53.16 d *1* (1982ChZF), 53.284 d *4* (1982RuZV), and 53.12 d *7* (1996Ja10). In this analysis the uncertainty of 1982RuZV value was increased from 0.004 to 0.0088 so that its relative weight was reduced from 83% to 50%. The weighted average of these values is 53.225 with an internal uncertainty of 0.006, a reduced-χ^2 of 10.5, and an external uncertainty of 0.020. This uncertainty increased by the LRSW method to 0.06 so that the most precise value of 53.284 is included; this uncertainty also includes the next most precise value of 53.16. T$_{1/2}$: The adopted half-life is dominated by the values of 1975La16, 1982ChZF, and 1982RuZV which contribute 10%, 39%, and 50% of the relative weight, respectively. The values of 1982ChZF and 1982RuZV differ by ≈ 10 σ and contribute 3.8 and 4.1 to the reduced-χ^2 value of 10.5. Since these three values differ by 0.12 days and the chemical forms in the latter two cases are not known,

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas 2002Ti10 (continued)

^{7}Be Levels (continued)

E(level)	J^{π}	$T_{1/2}$	XREF	Comments
				the chemical variation data in the above table suggest that some of this difference may be due to chemical affects. This suggests that the adopted uncertainty of 0.06 days is reasonable for general use. $T_{1/2}$: Values not used are: 54.5 d (J. F. Bonner, Jr., AEC report AECU-107 as quoted in 1953Kr16, no uncertainty); and 54.3 d *5* (Bouchez, Daudel, Daudel, and Muxart, J. Phys. et Radium 8 (1947) 336 as quoted in 1953Kr16, replaced by value of 1956Bo36); and 53.694 d *6*, 53.416 d *6*, and 54.226 d *6* (1999Hu20). The values of 1999Hu20 have very small uncertainties and have very large variations, up to 1.5%, with chemical form which need to be confirmed. If this large shift is correct, it would invalidate the uncertainty of our adopted value.
429.08 *10*	$1/2^{-}$	133 fs *17*	CDEFGHIJ	T=1/2
4570 *50*	$7/2^{-}$	175 keV *7*	A DEFGHIJ	%^{3}He=?; %α=? T=1/2
6.73×10^{3} *10*	$5/2^{-}$	1.2 MeV	A C F I	%^{3}He=?; %α=? T=1/2
7210 *60*	$5/2^{-}$	0.40 MeV *5*	ABC F H	%p=?; %^{3}He=?; %α=? T=1/2
9.27×10^{3} *10*	$7/2^{-}$		A	%p=?; %^{3}He=?; %α=? T=1/2
9900	$3/2^{-}$	≈1.8 MeV	AB	%p=?; %^{3}He=?; %α=? T=1/2
11010 *30*	$3/2^{-}$	320 keV *30*	AB F I	%p=?; %^{3}He=?; %α=? T=3/2
17000	$1/2^{-}$	≈6.5 MeV	A	%^{3}He=? T=1/2
				E(level): for possible states at higher energies see ^{4}He(^{3}He,^{3}He), (^{3}He,p); ^{6}Li(p,p), (p,2p), (p,pα) reactions.

$\gamma(^{7}Be)$

E_i(level)	J_i^{π}	E_{γ} †	E_f	J_f^{π}	Mult.	Comments
429.08	$1/2^{-}$	429.07	0.0	$3/2^{-}$	M1	$\Gamma_{\gamma}=3.43\times10^{-3}$ eV *45*; B(M1)(W.u.)=2.07 *27*

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

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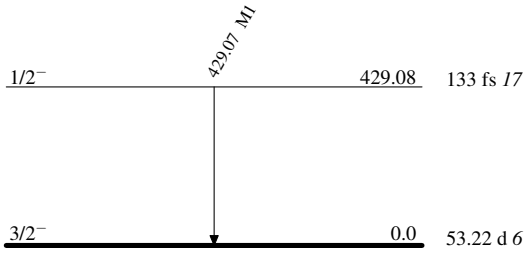
Level Scheme



$^{7}_{4}Be_{3}$