Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	S. -c. Wu	NDS 108,1057 (2007)	1-Mar-2007

Q(β^-)=−7.50×10^3 *6*; S(n)=8694 *15*; S(p)=3021 *18*; Q(α)=8072 *5* 2012Wa38
Note: Current evaluation has used the following Q record −7.50E3 7 *8694* 30 *2996* 25 *8071* 6 2003Au03.
Calculations, compilations, systematics:
Cluster model for α decay, Geiger-Nuttall plot: 1991Bu05, 1986Ir01.
n-p interaction energy: 1990Mo11.
Quasi-bands in even-even nuclei: 1984Sa37.
Spontaneous emission of heavy ions: 1986Po06.
Super- and hyperdeformed configurations: 1995We02.

^{216}Th Levels

Cross Reference (XREF) Flags

A (HI,xnγ)

E(level)†	J$^\pi$	T$_{1/2}$†	XREF	Comments
0.0	0$^+$	26.0 ms *2*	A	%α=100; %ε+%β^+≈0.01 syst %ε: from gross β-decay strength function (1973Ta30). 1968Va18 report %ε<0.6. log *ft*>3.6 gives %ε+%β^+<0.2 for any single ε+β^+ group. Eα=7921 keV *3*, weighted average of Eα=7923 keV *5* from 2005Ku31; 7919 keV *6* from 2001Ha46 and 7911 keV *8* from 1968Va18. 7922 keV *10* from 2000He17 is superseded by the value from 2005Ku31. T$_{1/2}$: weighted average of values measured in α-decay: 26.0 ms *2* from 2005Ku31, 25.4 ms *8* from 2001Ha46 and 28 ms *2* from 1968Va18. OThers: 27.0 ms *3* and 30 ms *3* from 2000H317 are superseded by data from 2005Ku31.
1478.2 *1*	2$^+$		A	J$^\pi$: stretched E2 to 0$^+$.
1687.7 *2*	3$^-$		A	J$^\pi$: E1 to 2$^+$, E1 from 4$^+$.
1813.8 *2*	4$^+$		A	J$^\pi$: stretched E2 to 2$^+$.
2013.7 *2*	6$^+$		A	J$^\pi$: stretched E2 to 4$^+$.
2040 *9*	8$^+$	134 μs *4*		%α=2.8 *9* %α from 2005Ku31. Other: 5 *+5−3* from 2001Ha46. %IT=97 *1* calculated by 1983Hi08 from the observed isomer ratio and comparison with that for ^{217}Pa(29/2 level). Configuration=h$_{9/2}$f$_{7/2}$. Eα=9923 keV *8*, weighted average of Eα=9930 keV *10* from 2005Ku31; 9915 keV *15* from 2001Ha46 and 9912 keV *20* from 1983Hi08. 9933 keV *15* from 2000He17 is superseded by the value from 2005Ku31. E(level): from the energy difference for the α-decay from this level and and the ground state to the ^{212}Ra ground state, corrected for recoil. J$^\pi$: suggested by 1983Hi08 on the basis of systematics of N=126 nuclei (^{210}Po,^{212}Rn,^{214}Ra). Current systematics of Z=90 nuclei (N=132,130,128) and Z=88 nuclei (N=130,128,126,124) confirm the expectation of an 8$^+$ level at ≈2 MeV. T$_{1/2}$: weighted average of values measured in α-decay: 0.135 ms *4* from 2005Ku31; 0.128 ms *8* from 2001Ha46 and 0.18 ms *4* from 1983Hi08. Other: 0.140 ms *5* from 2000He17 is superseded by data from 2005Ku31.
2130.5 *2*	(8$^+$)		A	Configuration=h$^2_{9/2}$.
2646.8 *1*	11$^-$	0.58 μs *3*	A	Configuration=h$_{9/2}$i$_{11/2}$. J$^\pi$: suggested by 1983Hi08 on the basis of systematics is an 11$^-$ level. Extrapolation from ^{210}Po (2849 keV), ^{212}Rn (2760 keV) and ^{214}Ra (2683 keV) puts the 11$^-$ level in ^{216}Th at ≈2.6 MeV. This extrapolation is again supported by the behavior

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{216}Th Levels (continued)

E(level)†	Jπ	$T_{1/2}$†	XREF	Comments
				of the 11^- level in Z=88 nuclei (^{218}Ra to ^{212}Ra).
3530.2 *4*	(12^+)		A	
3681.4 *7*	(14^+)	0.74 μs *7*	A	

† From (HI,xnγ), except as noted.

γ(^{216}Th)

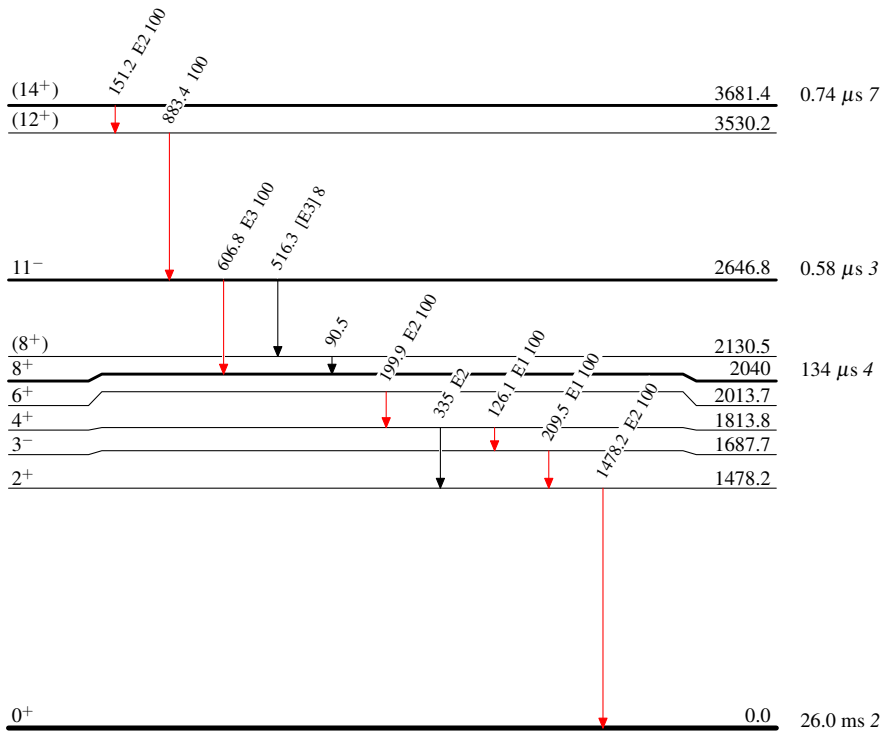
E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α†	Comments
1478.2	2^+	1478.2 *1*	100	0.0	0^+	E2	0.00487	
1687.7	3^-	209.5 *1*	100	1478.2	2^+	E1	0.0846	
1813.8	4^+	126.1 *1*	100	1687.7	3^-	E1	0.283	
		335		1478.2	2^+	E2	0.1216	
2013.7	6^+	199.9 *1*	100	1813.8	4^+	E2	0.660	
2130.5	(8^+)	(90.5 *3*)		2040	8^+			
2646.8	11^-	516.3 *2*	8 *2*	2130.5	(8^+)	[E3]	0.1428	B(E3)(W.u.)=5.0 *15*
		606.8 *1*	100 *4*	2040	8^+	E3	0.0876	B(E3)(W.u.)=21 *2*
3530.2	(12^+)	883.4 *3*	100	2646.8	11^-			
3681.4	(14^+)	151.2 *6*	100	3530.2	(12^+)	E2	1.94 *5*	B(E2)(W.u.)=0.053 *8*

† Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified



$^{216}_{90}Th_{126}$