^{167}W ε decay 1989Me02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	ENSDF	23-May-2013

Parent: ^{167}W: E=0.0; J^π=(+); $T_{1/2}$=19.9 s *5*; Q(ε)=6250 *30*; %ε+%$β^+$ decay=99.96 *1*

^{167}W-%ε+%$β^+$ decay: Based on %α(^{167}W)=0.04 *1* (1989Me02).

Others: 1987Es08 (see also 1989Br19); 1992HeZV.

The decay scheme is based on that of 1989Me02. No ε branch to the ^{167}Ta g.s. is known but, if it exceeded 7.2%, it would be an allowed branch; also, provided it were <84%, the branch to the 289 level (which has the same parity as the g.s.) would be allowed. Thus, ^{167}W(g.s.), ^{167}Ta(g.s.) and ^{167}Ta(289 level) must have the same parity. 1989Me02 assumed $J^\pi=5/2^-$ for the ^{167}W parent, based on systematics; this is not adopted here because J^π(^{167}Ta g.s.)=$(3/2^+)$ is favored in a (HI,xnγ) study by 1992Th02. In view of the likelihood of g.s. ε+$β^+$ feeding, the decay scheme has not been normalized.

^{167}Ta Levels

E(level)	J^π†	Comments
0.0	$(3/2^+)$	
94.4 *2*	$(5/2^+)$	
204.6 *3*	$(7/2^+)$	
232.83 *25*	$(7/2^+)$	
254.1 *5*		
289.0 *3*	$(5/2^+,7/2^+,9/2^+)$	
392.0 *4*	(≤7/2)	E(level): 175.4 *3* also possible; order of 175γ and 392γ uncertain.
496.57 *25*		
503.0 *5*		
567.4 *5*		
611.2 *5*	$(9/2^-)$	
663.0 *4*		

† From Adopted Levels.

ε,$β^+$ radiations

E(decay)	E(level)	Comments
(5.59×10^3† *3*)	663.0	
(5.64×10^3† *3*)	611.2	
(5.68×10^3† *3*)	567.4	
(5.75×10^3† *3*)	503.0	
(5.75×10^3 *3*)	496.57	εK/$β^+$=0.57 *11* (1989Me02) from I(K x ray, Ta) and I($γ^\pm$) in coincidence with 497γ. This implies Q=5590 *+300−240* (1989Me02) for ^{167}W ε decay, cf. 6250 *30* from 2012Wa38.
(5.96×10^3 *3*)	289.0	
(6.00×10^3† *3*)	254.1	
(6.05×10^3 *3*)	204.6	
(6.16×10^3 *3*)	94.4	
(6.25×10^3† *3*)	0.0	

† Existence of this branch is questionable.

^{167}W ε decay 1989Me02 (continued)

γ(^{167}Ta)

All gammas reported by 1989Me02 are in coincidence with K x ray(Ta) and $\gamma^{\pm}$.

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ‡	α#	Comments
84.4 *2*	29 *2*	289.0	(5/2$^+$,7/2$^+$,9/2$^+$)	204.6	(7/2$^+$)	M1(+E2)	≤1.3	7.18 *14*	α(K)=4.4 *15*; α(L)=2.1 *12*; α(M)=0.5 *3*; α(N+..)=0.14 *8* α(N)=0.12 *7*; α(O)=0.017 *9*; α(P)=0.00041 *15* α(K)exp=6 *3* (1989Me02)
94.4 *2*	100	94.4	(5/2$^+$)	0.0	(3/2$^+$)	E2(+M1)	≥1.1	4.77 *14*	α(K)=1.8 *8*; α(L)=2.3 *5*; α(M)=0.57 *13*; α(N+..)=0.15 *4* α(N)=0.13 *3*; α(O)=0.018 *4*; α(P)=0.00015 *8* α(exp)=4.5 *5* (1989Me02)
110.2 *2*	94 *4*	204.6	(7/2$^+$)	94.4	(5/2$^+$)	M1(+E2)	≤2.8	3.0 *4*	α(K)=1.9 *9*; α(L)=0.8 *4*; α(M)=0.21 *11*; α(N+..)=0.06 *3* α(N)=0.048 *25*; α(O)=0.007 *3*; α(P)=0.00017 *9* α(K)exp=2 *1* (1989Me02)
x141.6 *4*									Reported by 1987Es08 (and 1989Br19). Probably does not belong to ^{167}Ta; 1989Me02 report 141.6γ in coincidence with K x ray(Hf) and 139.5γ(^{167}Hf), so they assign it to ^{167}Ta ε decay.
159.7 *4*	21 *2*	254.1		94.4	(5/2$^+$)				I_γ: after correction for contribution from 158.7γ from ^{166}Ta decay.
175.4 *3*		567.4		392.0	(≤7/2)				I_γ: not determined; contaminant present. Iγ<17 expected based on intensity balance at the 392 level.
194.6 *3*	16 *2*	289.0	(5/2$^+$,7/2$^+$,9/2$^+$)	94.4	(5/2$^+$)				
232.8 *3*	46 *2*	232.83	(7/2$^+$)	0.0	(3/2$^+$)	[E2]		0.181	α(K)=0.1110 *16*; α(L)=0.0531 *8*; α(M)=0.01303 *20*; α(N+..)=0.00349 *6* α(N)=0.00306 *5*; α(O)=0.000422 *7*; α(P)=8.33×10^{-6} *12*
263.7 *3*	4 *1*	496.57		232.83	(7/2$^+$)				
270.2 *4*	13 *4*	503.0		232.83	(7/2$^+$)				
x275.6 *3*	22 *1*								
378.4 *4*	18 *5*	611.2	(9/2$^-$)	232.83	(7/2$^+$)				
392.0 *4*	17 *2*	392.0	(≤7/2)	0.0	(3/2$^+$)				
430.2 *3*	17 *2*	663.0		232.83	(7/2$^+$)				
496.6 *3*	34 *3*	496.57		0.0	(3/2$^+$)				
x533.7 *4*	21 *2*								

† From 1989Me02.

Continued on next page (footnotes at end of table)

^{167}W ε decay 1989Me02 (continued)

$\gamma(^{167}Ta)$ (continued)

‡ From α(K)exp (1989Me02).
# 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.
x γ ray not placed in level scheme.

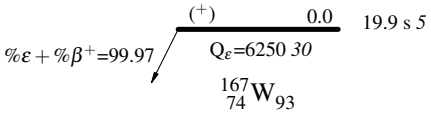
^{167}W ε decay 1989Me02

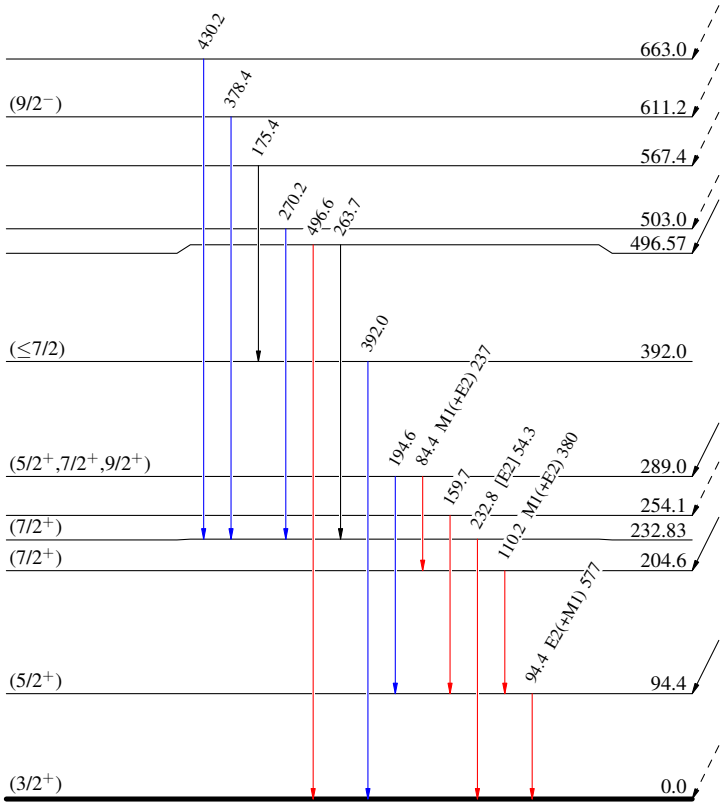
Decay Scheme

Intensities: Relative $I_{(\gamma+ce)}$

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$





$^{167}_{73}Ta_{94}$