^{171}W ε decay 1990Me12,1987Sz03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin, E. A. Mccutchan	NDS 151, 334 (2018)	30-Jun-2018

Parent: ^{171}W: E=0.0; J^π=(5/2$^-$); $T_{1/2}$=2.38 min *4*; Q(ε)=4630 *40*; %ε+%$β^+$ decay=100.0

The decay scheme and all data are from 1990Me12, except where noted.

1990Me12: sources from ^{36}Ar, ^{38}Ar, ^{40}Ar bombardments of enriched barium fluoride (93% for ^{136}Ba, 99.8% for ^{138}Ba); E(^{36}Ar, ^{38}Ar, ^{40}Ar)=165-205 MeV, helium-jet transport; measured Eγ (8 lines), Iγ (intrinsic Ge, Ge(Li) (timed spectra)), fast-slow γγ and γX coin, excitation functions.

1987Sz03: sources from ^{165}Ho(^{14}N,8n), E(^{14}N)=118-147 MeV; He-jet recoil transportation, Ge(Li); measured Eγ, Iγ, γ(t), excit.

Normalization for decay scheme is not attempted due to lack of knowledge of ground state to ground state feeding and also possible unobserved additional decay paths of the 52.1-keV level as suggested by intensity balance considerations.

α: Additional information 1.

^{171}Ta Levels

E(level)†	J^π‡	$T_{1/2}$‡	Comments
0.0	(5/2$^+$)	23.3 min *3*	
52.1 *3*	(7/2$^+$)		
182.9 *4*	(9/2$^+$)		
236.3 *3*	(9/2$^-$)		g=+0.515 *3* (2001Th23) g: from TDPAD (2001Th23).
530.8 *4*	(7/2$^-$)		

† From least-squares fit to Eγ.

‡ From Adopted Levels.

γ(^{171}Ta)

E_γ	I_γ†	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	α	Comments
52.1 *4*	51 *15*	52.1	(7/2$^+$)	0.0	(5/2$^+$)	[M1]	4.94 *14*	α(L)=3.83 *11*; α(M)=0.868 *24*; α(N)=0.208 *6*; α(O)=0.0328 *9*; α(P)=0.00227 *6* Iγ(52.1γ), as observed within the≈1 μs coincidence time resolution, is only 15% as intense as expected from intensity balance considerations (1990Me12). This suggests either that $T_{1/2}$(52.1 level)>1 μs for this possible ΔK=3 deexcitation or that there are alternative unobserved decay modes for the level, such as proceeding via the 31.2-keV (5/2$^-$) level known from (HI,xnγ) studies.
53.4 *4*	15 *1*	236.3	(9/2$^-$)	182.9	(9/2$^+$)	E1	0.377 *10*	α(L)=0.292 *8*; α(M)=0.0668 *17*; α(N)=0.0155 *4*; α(O)=0.00216 *6*; α(P)=8.80×10^{-5} *20*
x113.0#	34#							
130.8 *3*	21 *1*	182.9	(9/2$^+$)	52.1	(7/2$^+$)	[M1,E2]	1.7 *4*	α(K)=1.10 *59*; α(L)=0.44 *18*; α(M)=0.108 *48*; α(N)=0.025 *11*; α(O)=0.0036 *13* α(P)=9.6×10^{-5} *62* Other Iγ: 31 (1987Sz03).
x171.0#	6.8#							
184.2 *3*	100	236.3	(9/2$^-$)	52.1	(7/2$^+$)	E1	0.0750	α(K)=0.0623 *10*; α(L)=0.00988 *15*; α(M)=0.00224 *4*; α(N)=0.000528 *8*; α(O)=7.98×10^{-5} *12* α(P)=4.50×10^{-6} *7* Coincident with K x ray(Ta) (1990Me12).

Continued on next page (footnotes at end of table)

^{171}W ε decay 1990Me12,1987Sz03 (continued)

γ(^{171}Ta) (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α	Comments
236.3 *3*	4 *1*	236.3	(9/2$^-$)	0.0	(5/2$^+$)	[M2]	1.80	α(K)=1.396 *21*; α(L)=0.312 *5*; α(M)=0.0740 *11*; α(N)=0.0178 *3*; α(O)=0.00277 *4* α(P)=0.000175 *3*
294.5 *4*	89 *3*	530.8	(7/2$^-$)	236.3	(9/2$^-$)	[M1,E2]	0.149 *63*	α(K)=0.118 *59*; α(L)=0.024 *3*; α(M)=0.0057 *6*; α(N)=0.00135 *14*; α(O)=0.00020 *4* α(P)=1.05×10^{-5} *59* Other Iγ: 86 (1987Sz03).
[x]300.0 *4*	19 *1*							
478.7 *4*	83 *3*	530.8	(7/2$^-$)	52.1	(7/2$^+$)	[E1]	0.00751	α(K)=0.00631 *9*; α(L)=0.000929 *14*; α(M)=0.000209 *3*; α(N)=4.97×10^{-5} *7*; α(O)=7.73×10^{-6} *11* α(P)=5.00×10^{-7} *7* Other Iγ: 83 (1987Sz03).

[†] Photon intensity relative to Iγ=100 for 184.2γ.
[‡] From Adopted Gammas.
[#] From 1987Sz03; uncertainty unstated by authors. Tentatively assigned to ^{171}W decay, but γ(t) data indicate a $T_{1/2}$ which is not consistent with that assignment.
[x] γ ray not placed in level scheme.

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Decay Scheme

Intensities: Relative I_γ