^{171}Re ε decay 1987Ru05

History

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

Parent: ^{171}Re: E=0.0; J^π=(9/2$^-$); $T_{1/2}$=15.2 s *4*; Q(ε)=5840 *40*; %ε+%$β^+$ decay=100.0

1987Ru05: Sources from ^{139}La(^{36}Ar,4n), E(^{139}La)=165, 175, 194 MeV, helium-jet transport; measured Eγ, Iγ (Ge, Ge(Li)), fast-slow K x ray-γ coin, γγ coin, γ(t).

Other: 1987Sz03 (435γ and 570γ).

The decay scheme and all data are from 1987Ru05. Note that decay scheme may be incomplete (Q=5.8 MeV, while highest excited level observed at 1.07 MeV).

^{171}W Levels

E(level)†	J^π‡	$T_{1/2}$‡
0.0#	(5/2$^-$)	2.38 min *4*
102.0#	(7/2$^-$)	
133.4	(3/2$^-$)	
207.6	(5/2$^+$)	
233.4#	(9/2$^-$)	
568.4	(7/2$^-$)	
1066.0	(7/2$^-$)	

† From 1987Ru05; authors do not state uncertainties. A least-squares fit to Eγ (assuming the same weight for all data) yields very similar values.

‡ From the Adopted Levels.

Band(A): 5/2[523] band.

ε,$β^+$ radiations

ε+$β^+$ feedings are from intensity imbalance at each level (significant g.s. feeding is not expected (ΔJ=2, Δπ=no)).

εK/$β^+$=0.51 *7* (to 568.3 level); value corrected by 1987Ru05 for feeding from 1066 level.

εK/$β^+$=1.05 *17* (to 1066.2 level).

E(decay)	E(level)	Iβ+ †	Iε†	Log *ft*	I(ε+β+)†	Comments
(4.77×10^3 *4*)	1066.0	7.0 *5*	6.1 *4*	5.0 *1*	13.1 *9*	av Eβ=1699 *19*; εK=0.386 *7*; εL=0.0628 *11*; εM+=0.0194 *4*
(5.27×10^3 *4*)	568.4	18.9 *11*	11.7 *7*	4.8 *1*	30.6 *18*	av Eβ=1929 *19*; εK=0.314 *6*; εL=0.0510 *9*; εM+=0.0157 *3*
(5.61×10^3 *4*)	233.4	8.0 *8*	3.9 *4*	5.4 *1*	11.9 *12*	av Eβ=2084 *19*; εK=0.273 *5*; εL=0.0442 *8*; εM+=0.01364 *24*
(5.63×10^3‡ *4*)	207.6	0.8 *4*	1.0 *5*	8.0^{1u} *2*	1.8 *9*	av Eβ=2048 *18*; εK=0.447 *6*; εL=0.0739 *10*; εM+=0.0229 *3* log $f^{1u}t$<8.5 suggests that feeding is overestimated.
(5.71×10^3‡ *4*)	133.4	≤4.4	≤2.0	≥5.7	≤6.4	av Eβ=2130 *19*; εK=0.262 *5*; εL=0.0424 *8*; εM+=0.01308 *23* Negligible feeding of the 133 level is expected with ΔJ=(3). The apparent 6.4% *12* feeding implied by the level scheme of 1987Ru05 therefore, suggests the existence of additional transition(s) feeding the 133 level.
(5.74×10^3 *4*)	102.0	23 *3*	11 *2*	5.0 *1*	34 *5*	av Eβ=2145 *19*; εK=0.259 *5*; εL=0.0419 *7*; εM+=0.01290 *22*

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^{171}Re ε decay 1987Ru05 (continued)

ε,β+ radiations (continued)

† Absolute intensity per 100 decays.
‡ Existence of this branch is questionable.

γ(^{171}W)

Iγ normalization: from Σ I(γ+ce) to g.s.=100% (ε+β+ branch to g.s. not expected (ΔJ=2, Δπ=no)).

E_γ †	I_γ @	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡	α &	Comments
102.0	60 *5*	102.0	(7/2⁻)	0.0	(5/2⁻)	M1	4.49	α(K)=3.72 *6*; α(L)=0.593 *9*; α(M)=0.1350 *19*; α(N+..)=0.0382 *6* α(N)=0.0325 *5*; α(O)=0.00530 *8*; α(P)=0.000377 *6* α(exp)=4.5 (1987Ru05) Iγ=9.6% 4 assuming adopted normalization.
105.6	8 *2*	207.6	(5/2⁺)	102.0	(7/2⁻)	E1	0.326	α(K)=0.266 *4*; α(L)=0.0461 *7*; α(M)=0.01052 *15*; α(N+..)=0.00288 *4* α(N)=0.00249 *4*; α(O)=0.000377 *6*; α(P)=1.91×10^{-5} *3*
131.4	20 *2*	233.4	(9/2⁻)	102.0	(7/2⁻)	M1	2.18	α(K)=1.80 *3*; α(L)=0.286 *4*; α(M)=0.0652 *10*; α(N+..)=0.0185 *3* α(N)=0.01571 *22*; α(O)=0.00256 *4*; α(P)=0.000182 *3*
133.4	32 *2*	133.4	(3/2⁻)	0.0	(5/2⁻)	M1	2.08	α(K)=1.729 *25*; α(L)=0.274 *4*; α(M)=0.0625 *9*; α(N+..)=0.01768 *25* α(N)=0.01505 *21*; α(O)=0.00245 *4*; α(P)=0.0001746 *25*
207.6	19 *4*	207.6	(5/2⁺)	0.0	(5/2⁻)	[E1]	0.0570	α(K)=0.0473 *7*; α(L)=0.00751 *11*; α(M)=0.001704 *24*; α(N+..)=0.000473 *7* α(N)=0.000406 *6*; α(O)=6.35×10^{-5} *9*; α(P)=3.73×10^{-6} *6*
233.4	9 *1*	233.4	(9/2⁻)	0.0	(5/2⁻)	(E2) #	0.185	α(K)=0.1113 *16*; α(L)=0.0564 *8*; α(M)=0.01394 *20*; α(N+..)=0.00378 *6* α(N)=0.00330 *5*; α(O)=0.000470 *7*; α(P)=9.09×10^{-6} *13*
360.9	19 *1*	568.4	(7/2⁻)	207.6	(5/2⁺)	[E1]	0.01476	α(K)=0.01235 *18*; α(L)=0.00187 *3*; α(M)=0.000424 *6*; α(N+..)=0.0001185 *17* α(N)=0.0001013 *15*; α(O)=1.614×10^{-5} *23*; α(P)=1.032×10^{-6} *15*
434.9	47 *2*	568.4	(7/2⁻)	133.4	(3/2⁻)	[E2]	0.0300	α(K)=0.0223 *4*; α(L)=0.00588 *9*; α(M)=0.001405 *20*; α(N+..)=0.000387 *6* α(N)=0.000335 *5*; α(O)=5.03×10^{-5} *7*; α(P)=2.01×10^{-6} *3*
466.4	31 *3*	568.4	(7/2⁻)	102.0	(7/2⁻)	[M1]	0.0677	α(K)=0.0565 *8*; α(L)=0.00871 *13*; α(M)=0.00198 *3*; α(N+..)=0.000560 *8* α(N)=0.000476 *7*; α(O)=7.79×10^{-5} *11*; α(P)=5.60×10^{-6} *8*
498.0	13 *1*	1066.0	(7/2⁻)	568.4	(7/2⁻)	[M1]	0.0571	α(K)=0.0476 *7*; α(L)=0.00733 *11*; α(M)=0.001663 *24*; α(N+..)=0.000471 *7* α(N)=0.000400 *6*; α(O)=6.55×10^{-5} *10*; α(P)=4.71×10^{-6} *7*
568.4	100 *4*	568.4	(7/2⁻)	0.0	(5/2⁻)	[M1]	0.0405	α(K)=0.0338 *5*; α(L)=0.00518 *8*; α(M)=0.001175 *17*; α(N+..)=0.000333 *5* α(N)=0.000283 *4*; α(O)=4.63×10^{-5} *7*; α(P)=3.34×10^{-6} *5*
933.9	10 *2*	1066.0	(7/2⁻)	133.4	(3/2⁻)			
964.0	8 *1*	1066.0	(7/2⁻)	102.0	(7/2⁻)			
1066.0	50 *3*	1066.0	(7/2⁻)	0.0	(5/2⁻)			

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^{171}Re ε decay 1987Ru05 (continued)

$\gamma(^{171}W)$ (continued)

† Uncertainties not reported by 1987Ru05.
‡ From approximate α(exp) values, as deduced from simultaneous γ-K x ray(W) coin and γ-$\gamma^{\pm}$ coin, except as noted.
# From Adopted Gammas.
@ For absolute intensity per 100 decays, multiply by 0.160 *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.

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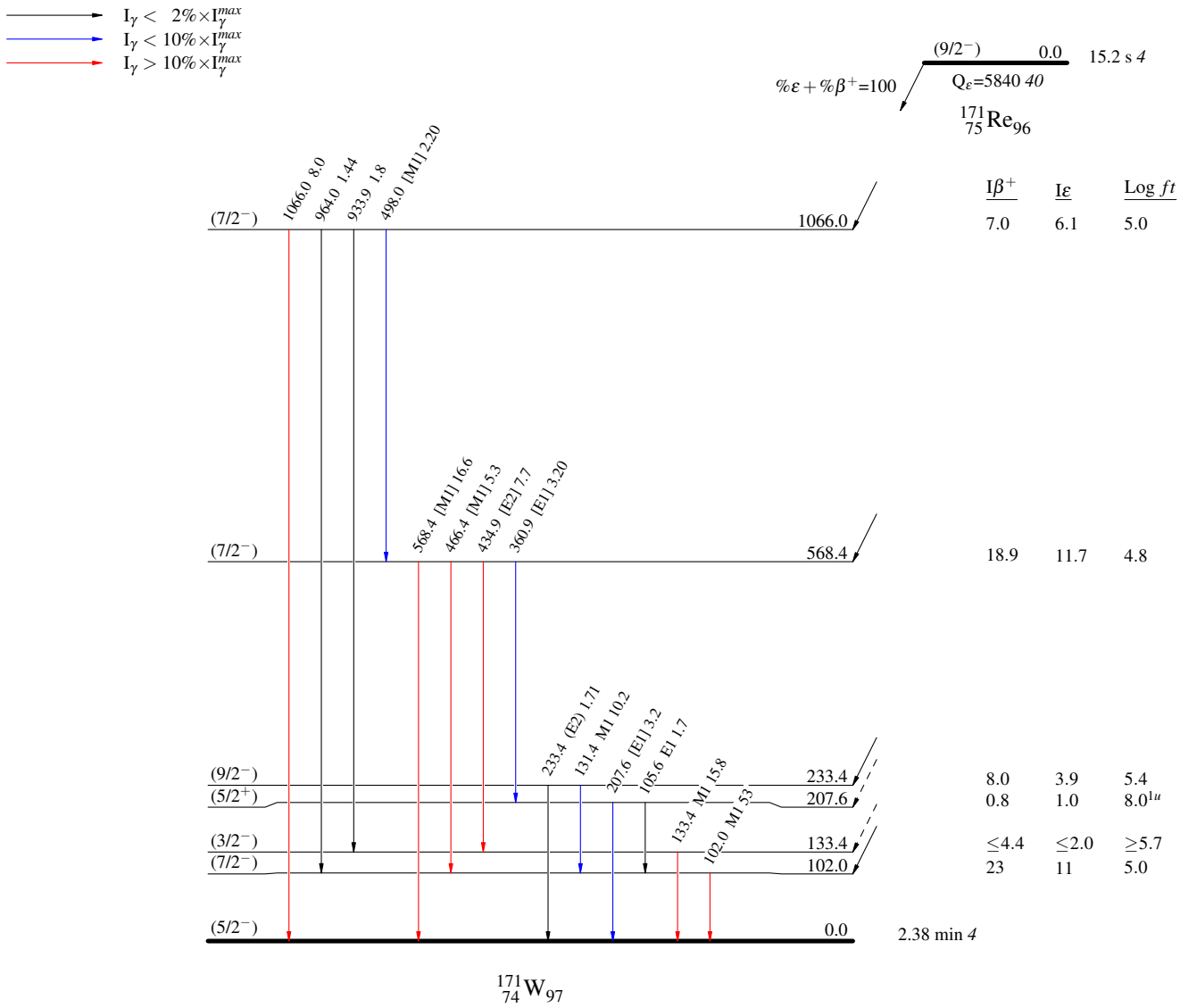
Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



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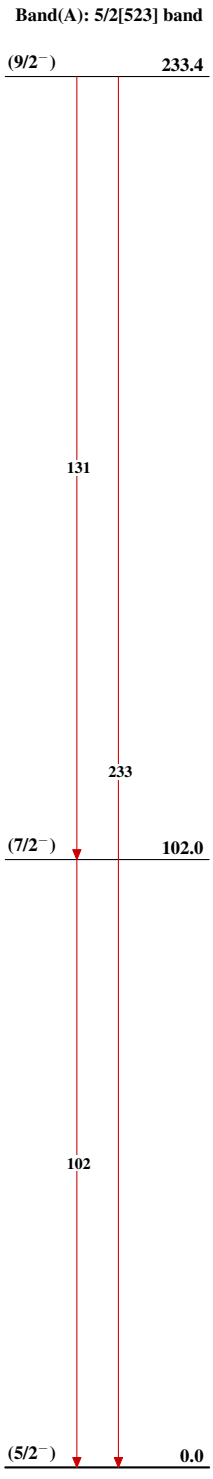

$^{171}_{74}W_{97}$