^{177}Re ε decay 1975Ha32,1975El07,1970Go20

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 159, 1 (2019)	30-Aug-2019

Parent: ^{177}Re: E=0.0; $J^\pi=5/2^-$; $T_{1/2}$=14 min *1*; Q(ε)=3430 *40*; %ε+%$β^+$ decay=100.0
Others: 1968Be43, 1970Ar15.

^{177}W Levels

E(level)†	J^π‡	$T_{1/2}$‡	Comments
0.0#	$1/2^-$	132.4 min *20*	
79.61# *9*	$3/2^-$		
94.93# *8*	$5/2^-$		
101.20@ *8*	$5/2^-$	38 ns *8*	E(level): Level energy of 113.6 keV is reported by 1975Ha32 and 1975El07 for the $5/2^-$ member of the *ν* 5/2[512] band.
135.30a *19*	$7/2^-$		
185.30& *19*	$7/2^+$	13 ns *3*	
202.80@ *13*	$7/2^-$		E(level): Level energy of 215.0 keV is reported by 1975Ha32 and 1975El07 for the $7/2^-$ member of the *ν*5/2[512] band.
252.50a *21*	$9/2^-$		
276.73# *12*	$7/2^-$		
304.93# *13*	$9/2^-$		
803.0? *5*	$(7/2^-)$		

† From least-squares fit to Eγ.
‡ From Adopted Levels, unless otherwise stated.
# *ν*1/2[521].
@ *ν*5/2[512].
& *ν*7/2[633].
a *ν*7/2[514].

γ(^{177}W)

Iγ normalization: From the decay scheme using I(γ+ce)(79.65γ)+I(γ+ce)(94.9γ)=100% and by assuming that there is no direct ε+$β^+$ feeding to the g.s. The value is an upper limit, since Iγ(101.2γ) is not known. Due to the absence of information for the intensities of (6.30)γ, (15.25)γ, (21.55)γ, 101.2γ, 101.4γ and 116.9γ, and for the appropriate mixing ratios, no meaningful e+$β^+$ feeding intensities and log *ft* values can be determined.

E_γ†	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α&	Comments
(6.25@ *11*)	101.20	$5/2^-$	94.93	$5/2^-$			
(15.49@ *11*)	94.93	$5/2^-$	79.61	$3/2^-$			
(21.74@ *11*)	101.20	$5/2^-$	79.61	$3/2^-$			
33.9‡ *2*	135.30	$7/2^-$	101.20	$5/2^-$	M1+E2	19.3 *5*	α(L)=14.9 *4*; α(M)=3.40 *8* α(N)=0.818 *19*; α(O)=0.133 *3*; α(P)=0.00945 *22* E_γ: Placed by the evaluator to depopulate the 135.2 keV level in accordance with adopted gammas. Mult.: From ce(L1)exp:ce(L2)exp:ce(L3)exp=100:≈18:≈13 (1975El07). The uncertainty of the Ice values is 20 %.

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^{177}Re ε decay 1975Ha32,1975El07,1970Go20 (continued)

γ(^{177}W) (continued)

E_γ [†]	I_γ [†b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ [a]	α [&]	Comments
49.8[‡] *2*	8.2 *17*	185.30	7/2$^+$	135.30	7/2$^-$				E_γ: Placed by the evaluator to depopulate the 186.0 keV level in accordance with the adopted level scheme. I_γ: From the branching ratios in the adopted gammas.
[x]76.1 *5*	30 *10*								
79.65[‡] *12*	85 *15*	79.61	3/2$^-$	0.0	1/2$^-$	M1+E2	1.0 *5*	9.5 *3*	α(K)=4.3 *20*; α(L)=3.9 *17*; α(M)=1.0 *5* α(N)=0.23 *10*; α(O)=0.033 *13*; α(P)=0.00045 *20* E_γ: Others: Eγ= 79.8 keV *5* (1970Go20). Mult.,δ: From ce(L1+L2)exp:ce(L3)exp=520 *40*/360 *80* (2000Ro41). Other: ce(L1)exp:ce(L2)exp:ce(L3)exp=≈24:100:96 (1975El07).
84.3[‡] *2*	75 *15*	185.30	7/2$^+$	101.20	5/2$^-$	E1		0.581	α(K)=0.470 *8*; α(L)=0.0856 *14*; α(M)=0.0196 *3* α(N)=0.00461 *8*; α(O)=0.000688 *11*; α(P)=3.28×10^{-5} *5* E_γ: Others: Eγ= 84.2 keV *5* (1970Go20). Placed by the evaluator to depopulate the 186.0 keV level in accordance with the level scheme. Mult.: from α(K)exp≈ 0.40 *11* (1975El07).
94.9[‡] *1*	46 *10*	94.93	5/2$^-$	0.0	1/2$^-$	E2		4.82	α(K)=0.956 *14*; α(L)=2.93 *5*; α(M)=0.740 *11* α(N)=0.174 *3*; α(O)=0.0238 *4*; α(P)=8.00×10^{-5} *12* E_γ: Others: Eγ= 95.6 keV *5* (1970Go20). Mult.: From ce(K)exp:ce(L2)exp:ce(L3)exp=53:100:83 (1975El07). The uncertainty of the Ice values is 20 %.
101.2[#] *1*		101.20	5/2$^-$	0.0	1/2$^-$				E_γ: Unresolved from 101.4γ, 7/2$^-$ to 5/2$^-$ transition within the ν5/2[512] band. Obscured by the 106.1γ and 103.6γ, the 2$^+$ to 0$^+$ transition in ^{178}W and ^{180}W, respectively.
101.6 *1*		202.80	7/2$^-$	101.20	5/2$^-$	M1+E2		4.54	α(K)=3.76 *6*; α(L)=0.600 *9*; α(M)=0.1366 *20* α(N)=0.0329 *5*; α(O)=0.00536 *8*; α(P)=0.000381 *6* E_γ,Mult.: From adopted gammas. Other: 104.4 *2* in 1975Ha32 and 1975El07. Unresolved from 101.2γ, 5/2$^-$ to 1/2$^-$ transition. Obscured by the 106.1γ and 103.6γ, the 2$^+$ to 0$^+$ transition in ^{178}W and ^{180}W, respectively.
117.2 *1*		252.50	9/2$^-$	135.30	7/2$^-$	M1+E2		3.01	α(K)=2.50 *4*; α(L)=0.397 *6*; α(M)=0.0905 *13* α(N)=0.0218 *3*; α(O)=0.00356 *5*; α(P)=0.000253 *4* E_γ,Mult.: From adopted gammas. Other: 116.9 *3* in 1975Ha32 and 1975El07. Obscured by 116.65γ of ^{177}Ta. Placed by the evaluator to depopulate the 252.4 keV level in accordance with the adopted level scheme.

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^{177}Re ε decay 1975Ha32,1975El07,1970Go20 (continued)

γ(^{177}W) (continued)

E_γ †	I_γ †b	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α&	Comments
x125	≤10							
181.5 *2*	14.1 *13*	276.73	7/2⁻	94.93	5/2⁻			E_γ: From adopted gammas. Other: 181.6 *3* (1975Ha32 and 1975El07). Obscured by 181.1γ of ^{178}W.
197.2 *1*	100	276.73	7/2⁻	79.61	3/2⁻	E2	0.323	I_γ: From the branching ratios in the adopted gammas. α(K)=0.1753 *25*; α(L)=0.1124 *16*; α(M)=0.0280 *4* α(N)=0.00662 *10*; α(O)=0.000932 *14*; α(P)=1.383×10^{-5} *20* E_γ: From adopted gammas. Others: 196.85 *20* (1975Ha32 and 1975El07) and 196.9 keV *5* (1970Go20). Mult.: From ce(K)exp:ce(L1+L2)exp:ce(L3)exp=100: 50:29 (1975El07). The uncertainty of the Ice values is 20 %.
210.0 *1*	33 *6*	304.93	9/2⁻	94.93	5/2⁻	E2	0.262	α(K)=0.1480 *21*; α(L)=0.0866 *13*; α(M)=0.0215 *3* α(N)=0.00509 *8*; α(O)=0.000720 *11*; α(P)=1.183×10^{-5} *17* E_γ: From adopted gammas. Other: 209.9 *5* (1975Ha32 and 1975El07). Mult.: From α(K)exp= 0.14 *4* (1975El07).
x600.2 *6*	20 *4*							E_γ: From 1975El07.
708.1‡c *6*	30 *6*	803.0?	(7/2⁻)	94.93	5/2⁻			
723.4‡c *6*	25 *5*	803.0?	(7/2⁻)	79.61	3/2⁻			
x1118.4 *8*	15 *3*							
x1196.5 *8*	15 *3*							
x1551.7 *15*	7 *2*							
x1770.5 *8*	26 *6*							
x1861.1 *8*	9 *2*							
x1886.1 *8*	9 *2*							
x1911.2 *8*	15 *6*							
x1944.9 *8*	8 *3*							
x1964.6 *8*	35 *10*							
x1986.1 *8*	12 *3*							

† From 1970Go20, unless otherwise stated.
‡ From 1975Ha32 and 1975El07.
# From adopted gammas, except as noted.
@ From adopted gammas using level energy differences. Not observed, but required by the coincidence relationships.
& Additional information 1.
a If No value given it was assumed δ=0.00 for E2/M1, δ=1.00 for E3/M2 and δ=0.10 for the other multipolarities.
b For absolute intensity per 100 decays, multiply by <0.1.
c Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

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Decay Scheme

Intensities: Relative I_γ