Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich, Balraj Singh	NDS 111,1211 (2010)	12-Apr-2010

Q(β^-)=−8.90×10^3 *6*; S(n)=8.98×10^3 *6*; S(p)=2.42×10^3 *8*; Q(α)=5.52×10^3 *5* 2012Wa38
Note: Current evaluation has used the following Q record $ −8900 *60* 8980 *60* 2420 *70* 5520 *50* 2009AuZZ,2003Au03.
Q(εp)=6980 *50* (2003Au03,2009AuZZ).
Additional information 1.

^{163}W Levels

Quasiparticle notation:
A: ν (π=+,α=+1/2)$_1$ from $i_{13/2}$ orbital.
B: ν (π=+,α=−1/2)$_1$ from $i_{13/2}$ orbital.
C: ν (π=+,α=+1/2)$_2$ from $i_{13/2}$ orbital.
E: ν (π=−,α=−1/2)$_1$ from $h_{9/2}$,$f_{7/2}$ orbitals.
F: ν (π=−,α=+1/2)$_1$ from $h_{9/2}$,$f_{7/2}$ orbitals.
e: π (π=−,α=−1/2)$_1$ from $h_{11/2}$ orbital.
f: π (π=−,α=+1/2)$_1$ from $h_{11/2}$ orbital.

Cross Reference (XREF) Flags

A ^{167}Os α decay (839 ms)
B ^{106}Cd(^{60}Ni,2pnγ)

E(level)†	J$^\pi$#	T$_{1/2}$	XREF	Comments
0.0@	7/2$^-$	2.67 s *10*	AB	%α=14 *2*; %ε+%β^+=86 *2* %α: from average of 15 *2* (2010Sc02) and 13 *2* (1996Pa01). Method: detection of time correlated events of recoil nuclei and α particles 1in double-sided silicon strip detectors. Other: 41 *5* (1979Ho10, from parent-daughter intensity correlations). T$_{1/2}$: weighted av of 2.6 s *1* (2010Sc02), 3.0 s *13* (1996Pa01), 3.0 s *2* (1979Ho10) and 2.5 s *3* (1973Ea01). J$^\pi$: Proposed in 2010Sc02, based on L=0 α decays in ^{171}Pt –> ^{167}Os –> ^{163}W α decay chain, and consistent observation of 13/2$^+$ –> 9/2$^-$ –> 7/2$^-$ cascades in these nuclei and systematics of lowest-lying 7/2$^-$ and 9/2$^-$ states in even-Z, odd-N nuclei in the vicinity.
102.0& *6*	9/2$^-$		B	J$^\pi$: M1 γ to 7/2$^-$, see also comment for g.s.
441.8@ *6*	11/2$^-$		B	J$^\pi$: E2 γ to 7/2$^-$; E1 γ from 13/2$^+$.
480.3a *7*	13/2$^+$	154 ns *3*	B	J$^\pi$: M2 γ to 9/2$^-$; see also comment for g.s. T$_{1/2}$: from 2010Sc02, measured from time differences between recoil implantations and delayed γ rays detected in the GREAT focal plane spectrometer. Delayed γ rays were observed at 38, 102, 378 and 442 keV.
516.2& *8*	(13/2$^-$)		B	
864.4a *9*	(17/2$^+$)		B	
1013.2@ *12*	(15/2$^-$)		B	
1079.5& *10*	(17/2$^-$)		B	
1370.5a *10*	(21/2$^+$)		B	
1624.3?‡d *10*			B	
1650.8@ *16*	(19/2$^-$)		B	
1733.8& *11*	(21/2$^-$)		B	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{163}W Levels (continued)

E(level)[†]	Jπ[#]	XREF	E(level)[†]	Jπ[#]	XREF	E(level)[†]	Jπ[#]	XREF
1925.1[a] *11*	(25/2+)	B	3173.8[&] *16*	(29/2−)	B	4786.7[b] *16*	(41/2−)	B
2236.4? *19*		B	3327.1?[d] *16*		B	5186.7[c] *18*	(43/2−)	B
2250.0?[‡d] *14*		B	3775.6?[b] *16*		B	5295.8[a] *16*	(45/2+)	B
2411?[@] *3*		B	3825.3[a] *14*	(37/2+)	B	5447.9[b] *19*	(45/2−)	B
2441.8[&] *12*	(25/2−)	B	3900[&] *3*	(33/2−)	B	5939.2?[c] *20*	(47/2−)	B
2527.9[a] *12*	(29/2+)	B	3955.0[c] *14*	(35/2−)	B	6058.6[a] *19*	(49/2+)	B
2863.5? *21*		B	4230.0[b] *16*	(37/2−)	B	6187.2[b] *22*	(49/2−)	B
2880.5?[‡d] *16*		B	4549.1[c] *15*	(39/2−)	B	6864.7[a] *21*	(53/2+)	B
3159.0[a] *13*	(33/2+)	B	4549.5[a] *15*	(41/2+)	B	7737[a] *3*	(57/2+)	B

[†] From least-squares fit to listed Eγ's.
[‡] Ordering of the transitions in the 630-626-760 cascade is uncertain.
[#] As proposed by 2010Th01 in (^{60}Ni,2pnγ), based on observation of band structures, DCO ratios for selected transitions, systematics and comparison with cranked shell-model calculations.
[@] Band(A): Band E.
[&] Band(a): Band F –>Fef or FAB.
[a] Band(B): Yrast band A –>AEF –>AEFef. Two band crossings at $\hbar\omega\approx0.30$ and 0.37 MeV, respectively. This band was first reported in 1992DrZU but with no details of γ-ray energies in the band.
[b] Band(C): Band FAB.
[c] Band(c): Band EAB.
[d] Band(D): γ cascade. Ordering of the transitions in the 630-626-760 cascade is uncertain.

γ(^{163}W)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	α[@]	Comments
102.0	9/2−	102.1 *7*	100	0.0	7/2−	M1[#]	4.47 *11*	
441.8	11/2−	441.7 *7*	100	0.0	7/2−	E2[#]	0.0288	
480.3	13/2+	38.4 *7*	100 *13*	441.8	11/2−	E1[#]	0.97 *6*	B(E1)(W.u.)=9.3×10^{-6} *17*
		378.3 *6*	58 *8*	102.0	9/2−	M2[#]	0.412	B(M2)(W.u.)=0.18 *4*
516.2	(13/2−)	414.2 *5*	100	102.0	9/2−			
864.4	(17/2+)	384.1 *5*	100	480.3	13/2+	Q		
1013.2	(15/2−)	571.4 *10*	100	441.8	11/2−			
1079.5	(17/2−)	563.3 *5*	100	516.2	(13/2−)			
1370.5	(21/2+)	506.2 *5*	100	864.4	(17/2+)	Q		
1624.3?		759.9[‡] *5*	100	864.4	(17/2+)			
1650.8	(19/2−)	637.6[&] *10*	100[&]	1013.2	(15/2−)			
1733.8	(21/2−)	654.3 *5*	100	1079.5	(17/2−)			
1925.1	(25/2+)	554.6 *5*	100	1370.5	(21/2+)	Q		
2236.4?		585.6 *10*	100	1650.8	(19/2−)			
2250.0?		625.6[‡] *10*	100	1624.3?				
2411?		760.3 *20*	100	1650.8	(19/2−)			
2441.8	(25/2−)	708.0 *5*	100	1733.8	(21/2−)			
2527.9	(29/2+)	602.8 *5*	100	1925.1	(25/2+)	Q		
2863.5?		627.1 *10*	100	2236.4?				
2880.5?		630.4[‡] *10*	100	2250.0?				
3159.0	(33/2+)	631.1 *5*	100	2527.9	(29/2+)	Q		
3173.8	(29/2−)	732.0 *10*	100	2441.8	(25/2−)			
3327.1?		446.5 *10*	100	2880.5?				

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

γ(^{163}W) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Comments
3775.6?		448.4 *10*	100	3327.1?		
3825.3	(37/2$^+$)	666.3 *5*	100	3159.0	(33/2$^+$)	
3900	(33/2$^-$)	725.8 *20*	100	3173.8	(29/2$^-$)	
3955.0	(35/2$^-$)	796.0 *5*	100	3159.0	(33/2$^+$)	
4230.0	(37/2$^-$)	275.1 *10*	55 *7*	3955.0	(35/2$^-$)	Mult.: possible M1 transition linking the two signature partners.
		454.3 *10*	100 *11*	3775.6?		
4549.1	(39/2$^-$)	594.1 *5*	100	3955.0	(35/2$^-$)	
4549.5	(41/2$^+$)	724.2 *5*	100	3825.3	(37/2$^+$)	
4786.7	(41/2$^-$)	556.7 *5*	100	4230.0	(37/2$^-$)	
5186.7	(43/2$^-$)	637.6[&] *10*	100[&]	4549.1	(39/2$^-$)	
5295.8	(45/2$^+$)	746.3 *5*	100	4549.5	(41/2$^+$)	
5447.9	(45/2$^-$)	661.2 *10*	100	4786.7	(41/2$^-$)	
5939.2?	(47/2$^-$)	752.5[a] *10*	100	5186.7	(43/2$^-$)	
6058.6	(49/2$^+$)	762.8 *10*	100	5295.8	(45/2$^+$)	
6187.2	(49/2$^-$)	739.3 *10*	100	5447.9	(45/2$^-$)	
6864.7	(53/2$^+$)	806.1 *10*	100	6058.6	(49/2$^+$)	
7737	(57/2$^+$)	872.5 *20*	100	6864.7	(53/2$^+$)	

† Stretched quadrupole (most likely E2) from DCO value,
‡ Ordering of the transitions in the 630-626-760 cascade is uncertain.
# From 2010Sc02.
@ 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.
& Multiply placed with intensity suitably divided.
[a] Placement of transition in the level scheme is uncertain.

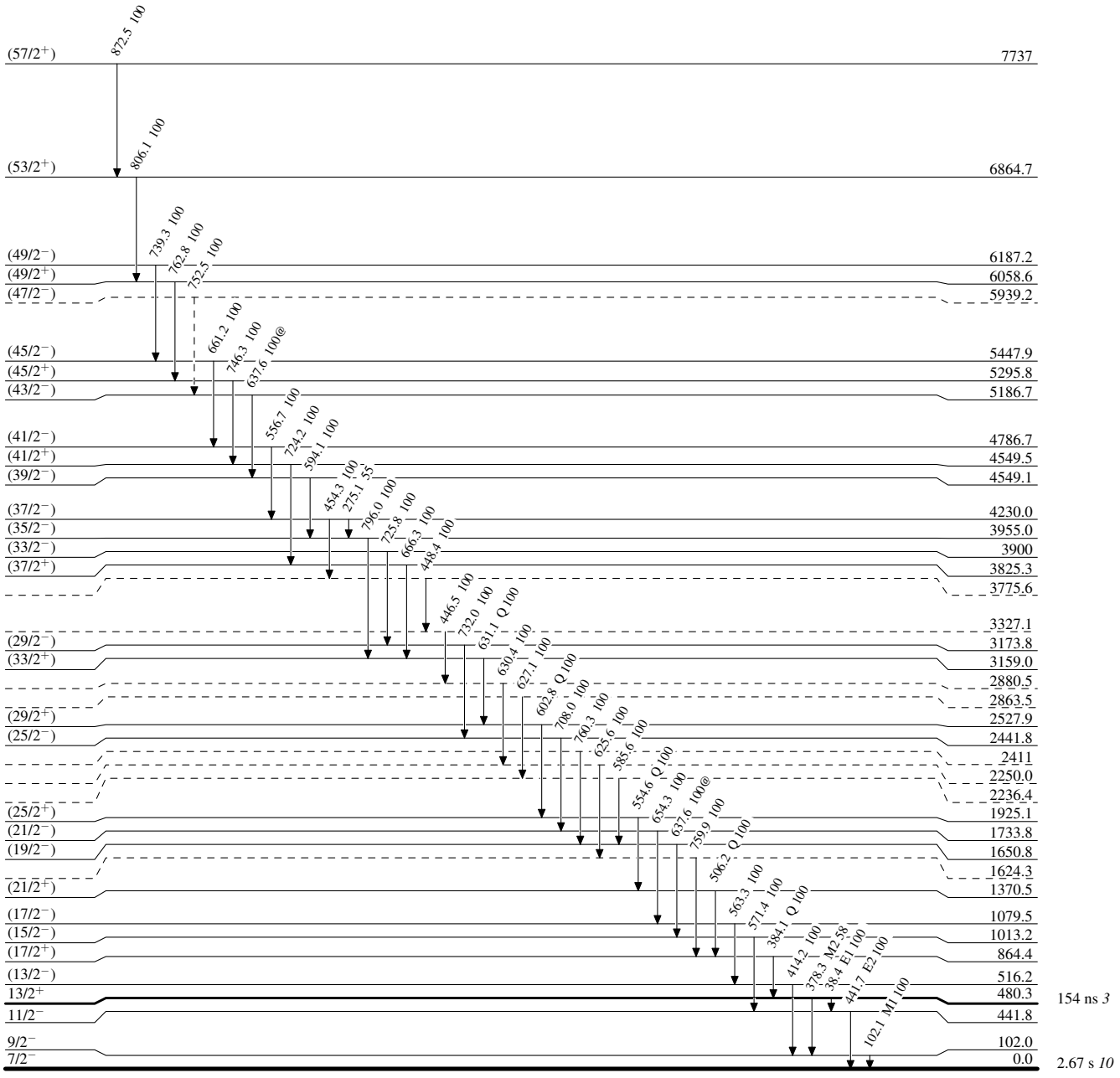
Adopted Levels, Gammas

Legend

Level Scheme

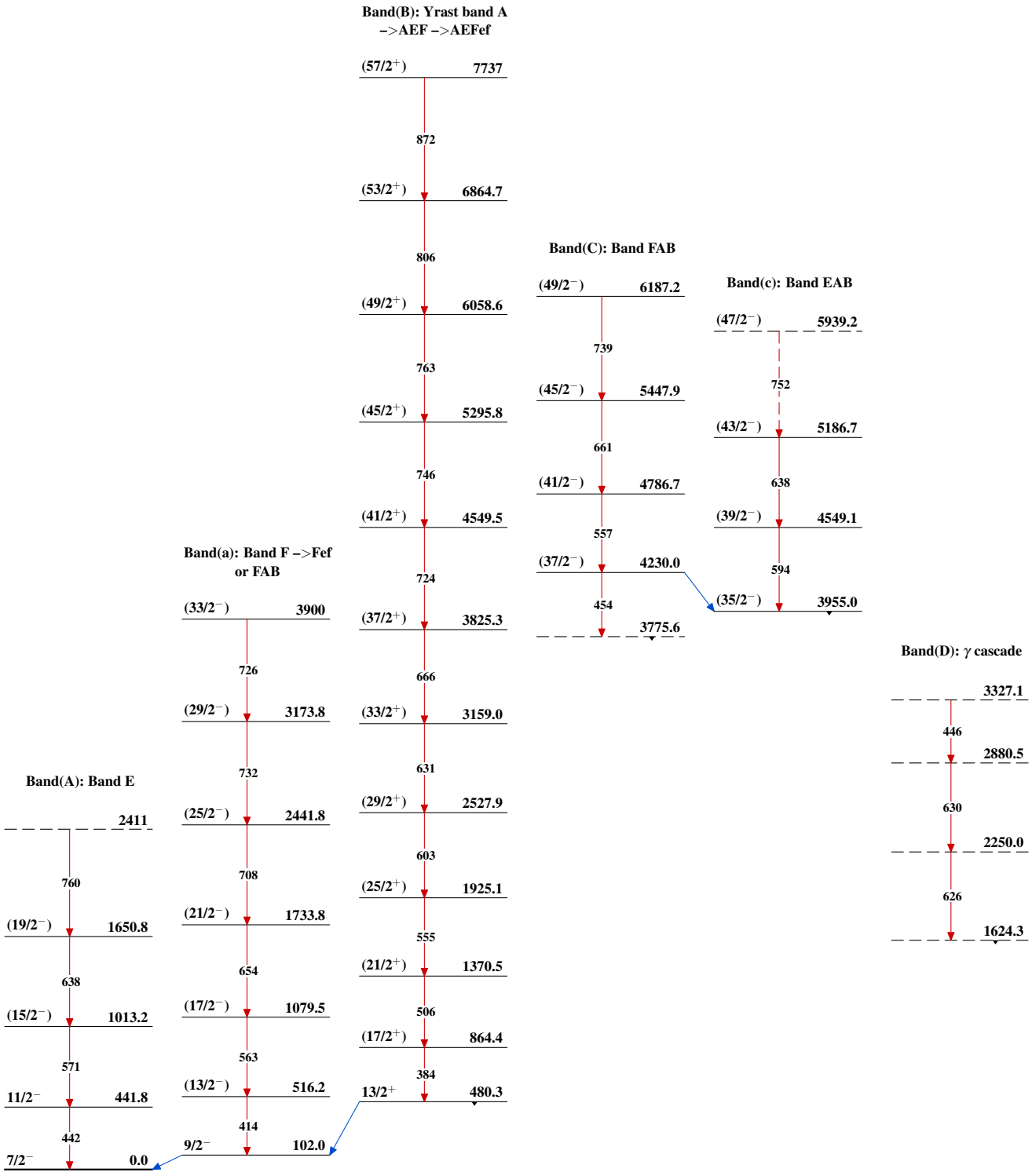
Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

γ Decay (Uncertain)



$^{163}_{74}W_{89}$

Adopted Levels, Gammas



$^{163}_{74}W_{89}$