Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 194,460 (2024)	31-Oct-2022

Q(β^-)=−6987 *29*; S(n)=10640 *30*; S(p)=1318 *20*; Q(α)=4290 *30* 2021Wa16
Q(ε)=5790 *30*, Q(εp)=1510 *30*, S(2n)=19460 *40*, S(2p)=5630 *30* (2021Wa16).
^{165}Ta isotope produced and identified by 1982Li17 in reaction Lu(^{3}He,xn) at 280 MeV; and by 1982Br15 in ^{151}Eu(^{20}Ne,6n) at 154-156 MeV. ^{165}Ta is also the daughter product of ^{169}Re α decay (1978Ca11,1982De11,1984Sc06,1992Me10).
Additional information 1.

^{165}Ta Levels

Cross Reference (XREF) Flags

- A ^{165}W ε decay (5.1 s)
- B ^{169}Re α decay (8.1 s)
- C ^{169}Re α decay (15.1 s)
- D ^{142}Nd(^{27}Al,4nγ),

E(level)[†]	J$^\pi$[#]	$T_{1/2}$	XREF	Comments
0.0[@]	(9/2$^-$)	31.0 s *15*	CD	%ε+%β^+=100 E(level): assumed as the g.s. From α decay of low-spin isomer of ^{169}Re, there is the possibility of existence of a low-lying low-spin state with J^π=(1/2$^+$,3/2$^+$) as suggested by 2004GoZZ. J$^\pi$: proposed by 2001Ro01 in (^{27}Al,4nγ), based on systematics of yrast states in neighboring odd-A Ta isotopes and theoretical calculations. $T_{1/2}$: from ^{165}Ta decay (1982Li17). Other: 35 s *10* (1982Br15).
25?[‡] *18*			B	
70.60[&] *24*	(11/2$^-$)		D	
200?[‡] *18*			B	
297.30[@] *24*	(13/2$^-$)		D	
470.1[&] *3*	(15/2$^-$)		D	
793.9[@] *3*	(17/2$^-$)		D	
997.9[&] *4*	(19/2$^-$)		D	
1399.2[@] *4*	(21/2$^-$)		D	
1618.4[&] *4*	(23/2$^-$)		D	
2071.0[@] *5*	(25/2$^-$)		D	
2294.8[&] *5*	(27/2$^-$)		D	
2655.7[@] *5*	(29/2$^-$)		D	
2790.5[&] *5*	(31/2$^-$)		D	
2974.3[@] *6*	(33/2$^-$)		D	
3174.5[&] *6*	(35/2$^-$)		D	
3412.8[@] *6*	(37/2$^-$)		D	
3683.0[&] *6*	(39/2$^-$)		D	
3969.8[@] *6*	(41/2$^-$)		D	
4291.7[&] *6*	(43/2$^-$)		D	
4622.2[@] *7*	(45/2$^-$)		D	
4983.1[&] *7*	(47/2$^-$)		D	
5355.5[@] *7*	(49/2$^-$)		D	

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Adopted Levels, Gammas (continued)

^{165}Ta Levels (continued)

E(level)[†]	J$^{\pi}$[#]	XREF
5752.5[&] *7*	(51/2$^-$)	D
6168.2[@] *8*	(53/2$^-$)	D

[†] From a least-squares fit to Eγ data.
[‡] Tentative level from ^{169}Re α decay (8.1 s).
[#] As proposed by 2001Ro01 in ^{142}Nd(^{27}Al,4nγ), based on $\gamma\gamma(\theta)$(DCO) data and band assignments.
[@] Band(A): π9/2[514], α=+1/2. The alignment of the first pair of $i_{13/2}$ neutrons occurs at $\hbar\omega\approx$0.25 MeV between spins 29/2 and 33/2. A=14.3.
[&] Band(a): π9/2[514], α=−1/2. The alignment of the first pair of $i_{13/2}$ neutrons occurs at $\hbar\omega\approx$0.25 MeV between spins 27/2 and 31/2. A=14.5.

γ(^{165}Ta)

E$_i$(level)	J$_i^{\pi}$	E$_\gamma$[†]	I$_\gamma$[†]	E$_f$	J$_f^{\pi}$	Mult.[‡]
70.60	(11/2$^-$)	70.6 *3*	100	0.0	(9/2$^-$)	
297.30	(13/2$^-$)	226.7 *3*	100 *14*	70.60	(11/2$^-$)	M1
		297.3 *3*	12 *5*	0.0	(9/2$^-$)	
470.1	(15/2$^-$)	172.8 *3*	70 *13*	297.30	(13/2$^-$)	M1
		399.5 *3*	100 *20*	70.60	(11/2$^-$)	(E2)
793.9	(17/2$^-$)	323.8 *3*	100 *24*	470.1	(15/2$^-$)	M1
		496.6 *3*	58 *6*	297.30	(13/2$^-$)	E2
997.9	(19/2$^-$)	204.0 *3*	23 *3*	793.9	(17/2$^-$)	D
		527.8 *3*	100 *3*	470.1	(15/2$^-$)	E2
1399.2	(21/2$^-$)	401.3 *3*	100 *22*	997.9	(19/2$^-$)	(M1)
		605.3 *3*	90 *21*	793.9	(17/2$^-$)	
1618.4	(23/2$^-$)	219.2 *3*	11.2 *11*	1399.2	(21/2$^-$)	D
		620.5 *3*	100 *3*	997.9	(19/2$^-$)	E2
2071.0	(25/2$^-$)	452.5 *3*	100 *14*	1618.4	(23/2$^-$)	M1
		671.7 *3*	88 *28*	1399.2	(21/2$^-$)	
2294.8	(27/2$^-$)	224.0 *3*	15.7 *14*	2071.0	(25/2$^-$)	
		676.5 *3*	100 *13*	1618.4	(23/2$^-$)	E2
2655.7	(29/2$^-$)	361.0 *3*	100 *24*	2294.8	(27/2$^-$)	M1
		584.5 *3*	88 *12*	2071.0	(25/2$^-$)	E2
2790.5	(31/2$^-$)	134.5 *3*	72 *6*	2655.7	(29/2$^-$)	D
		496.0 *3*	100 *9*	2294.8	(27/2$^-$)	E2
2974.3	(33/2$^-$)	183.8 *3*	100 *8*	2790.5	(31/2$^-$)	M1
		319[#] *1*	≤4	2655.7	(29/2$^-$)	
3174.5	(35/2$^-$)	200.2 *3*	100 *7*	2974.3	(33/2$^-$)	M1
		384.0 *3*	29 *5*	2790.5	(31/2$^-$)	
3412.8	(37/2$^-$)	238.4 *3*	100 *3*	3174.5	(35/2$^-$)	M1
		438.4 *3*	55 *11*	2974.3	(33/2$^-$)	(E2)
3683.0	(39/2$^-$)	270.3 *3*	100 *7*	3412.8	(37/2$^-$)	M1
		508.4 *3*	62 *22*	3174.5	(35/2$^-$)	(E2)
3969.8	(41/2$^-$)	286.7 *3*	100 *40*	3683.0	(39/2$^-$)	M1
		557.0 *3*	82 *11*	3412.8	(37/2$^-$)	E2
4291.7	(43/2$^-$)	322.1 *3*	100.0 *21*	3969.8	(41/2$^-$)	M1
		608.8 *3*	72 *15*	3683.0	(39/2$^-$)	
4622.2	(45/2$^-$)	330.3 *3*	100 *6*	4291.7	(43/2$^-$)	M1
		652.3 *3*	100 *14*	3969.8	(41/2$^-$)	E2
4983.1	(47/2$^-$)	360.5 *3*	100 *21*	4622.2	(45/2$^-$)	M1
		691.8 *3*	53 *21*	4291.7	(43/2$^-$)	(E2)
5355.5	(49/2$^-$)	372.4 *3*	100 *10*	4983.1	(47/2$^-$)	

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Adopted Levels, Gammas (continued)

$\gamma(^{165}Ta)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]
5355.5	$(49/2^-)$	733.2 *3*	65 *15*	4622.2	$(45/2^-)$	Q
5752.5	$(51/2^-)$	769.4 *3*	100	4983.1	$(47/2^-)$	
6168.2	$(53/2^-)$	812.7 *3*	100	5355.5	$(49/2^-)$	

[†] From $^{142}Nd(^{27}Al,4n\gamma)$.
[‡] From $\gamma\gamma(\theta)$(DCO) and/or γ(lin pol) in $^{142}Nd(^{27}Al,4n\gamma)$. For mult=M1 ($\Delta J=1$) transitions, small E2 admixture cannot be ruled out. The mult=D indicates $\Delta J=1$ transition.
[#] Placement of transition in the level scheme is uncertain.

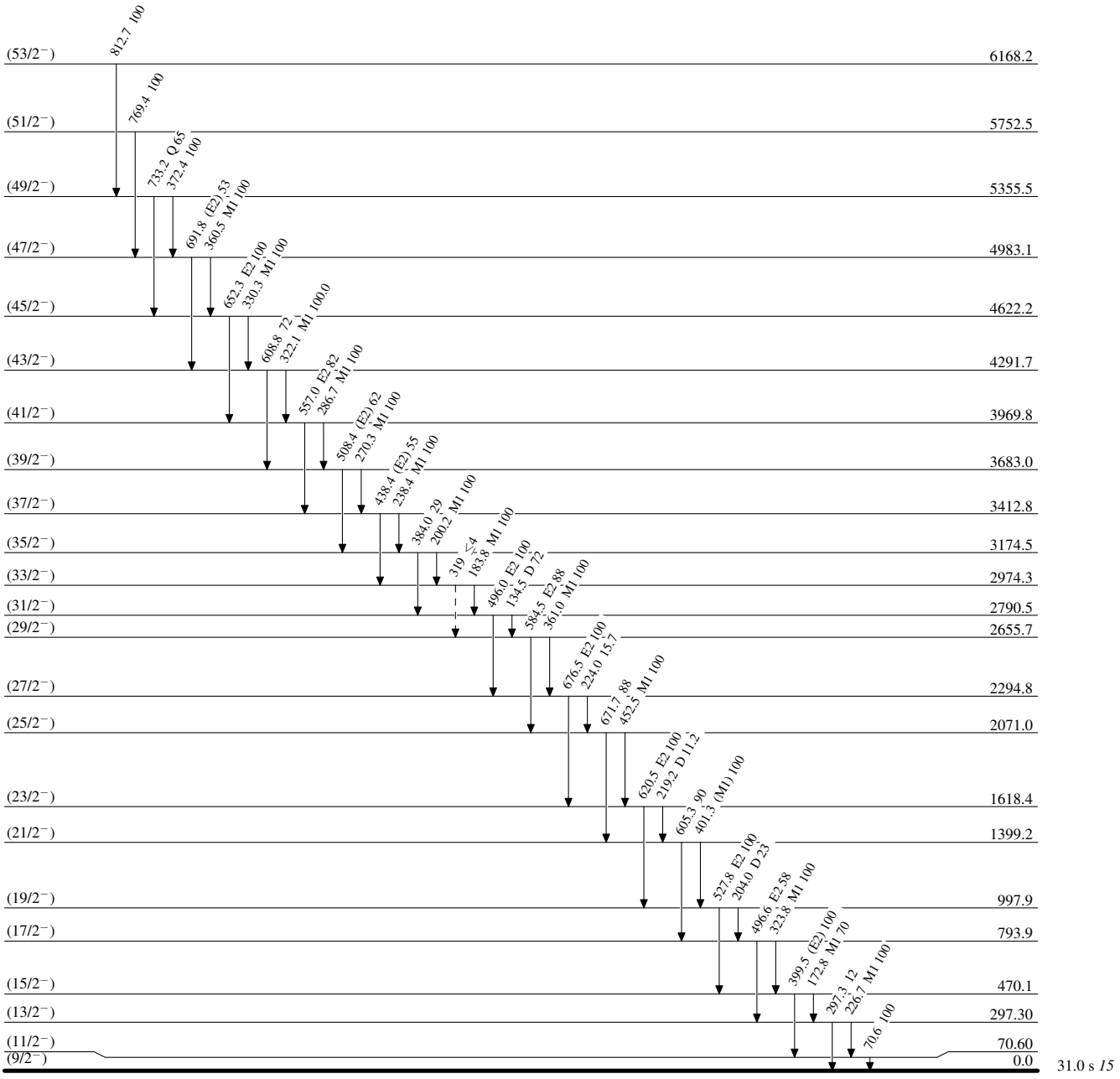
Adopted Levels, Gammas

Legend

Level Scheme

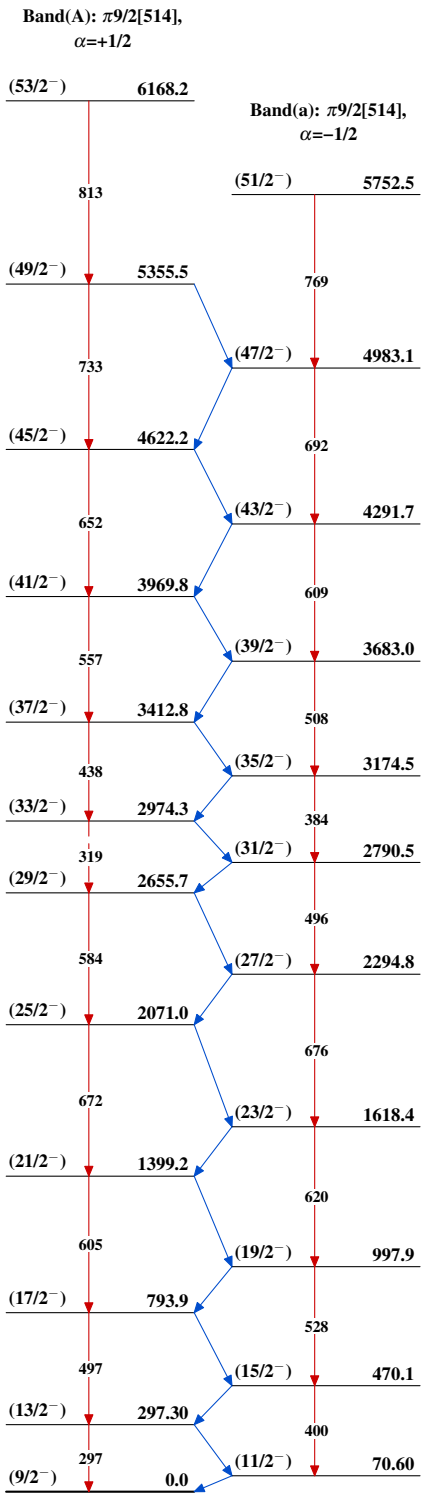
Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{165}_{73}Ta_{92}$

Adopted Levels, Gammas



$^{165}_{73}Ta_{92}$