Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	T. W. Burrows	NDS 109,171 (2008)	30-Oct-2007

Q(β^-)=−1.237×10^4 *4*; S(n)=1.584×10^4 *19*; S(p)=1621 *8*; Q(α)=−5663 *8* 2012Wa38
Note: Current evaluation has used the following Q record −1.291E4 501.583e$^+$4121620 17 −5622 *17* 2003Au03.
All data are from ^{24}Mg(^{24}Mg,p2nγ), except as noted.

^{45}V Levels

E(B),J(D) 56.4-57.2 doublet deduced on basis of two $T_{1/2}$'s associated with 56.4γ and a detailed analysis of the $\gamma\gamma$(t) spectra showing two gammas with Eγ=329.7 and Eγ=328.9, respectively, in (^{7}Li,2nγ). π(56.7)=π(56.8) from mult(0.8γ).

Cross Reference (XREF) Flags

- A ^{45}Cr β^+ decay: partial
- B ^{46}Mn β^+p decay: partial
- C ^{24}Mg(^{24}Mg,p2nγ) E=83 MeV
- D ^{40}Ca(^{7}Li,2nγ)

E(level)	J$^\pi$†	$T_{1/2}$‡	XREF	Comments
0.0#	7/2$^-$	547 ms *6*	ABCD	%ε+%β^+=100 J$^\pi$: from log *ft*=3.6 to 7/2$^-$. μ: 2001Bu02 predict μ=3.63 *4* or 3.83 *4* based on linear correlations between g.s. gyromagnetic ratios and superallowed β-decay transition strengths of mirror nuclei and shell model calculations.
56.7 *5*	(5/2$^-$)	≤4.2 ns	BCD	
56.8 *6*	(3/2$^-$)	0.43 μs *8*	BCD	
385.9@ *5*	(3/2$^+$)		BCD	Peak at ≈390 in ^{50}Cr(p,^{6}He) spectra not discussed by 1975Mu09 (E=46 MeV, θ=10.6°. Mag spect; pc, scin).
797.2& *5*	(5/2$^+$)		BCD	
1272.2@ *4*	(7/2$^+$)		BCD	
1324.0a *5*	(9/2$^-$)		ABC	
1462.0# *5*	(11/2$^-$)		C	
1916.5& *6*	(9/2$^+$)		C	
2489.1@ *6*	(11/2$^+$)		C	
2626.3a *6*	(13/2$^-$)		C	
3004.4# *6*	(15/2$^-$)		C	
3444.6& *12*	(13/2$^+$)		C	
3604.5a *7*	(17/2$^-$)		C	
3910.2@ *12*	(15/2$^+$)		C	
4391.7# *7*	(19/2$^-$)		C	
4800 *53*	(7/2$^-$)		A	%p≈100 T=(3/2) E(level): from E(p)(c.m.)=2.10 MeV *5* to ^{44}Ti 1082.99 *9* state in ^{45}Cr β^+p decay and S(p)(^{45}V)=1617 *17*. Other: 4803 *28* from Coulomb energy prediction for the mass of the ^{45}V analog state. J$^\pi$,T: identified as the T_z=+1/2 member of J^π=7/2$^-$, $T_{1/2}$=3/2 quadruplet (^{45}Sc g.s. parent); see ^{45}Cr β^+ decay.
5685.7@ *14*	(19/2$^+$)		C	

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Adopted Levels, Gammas (continued)

^{45}V Levels (continued)

E(level)	J^{π}[†]	XREF
6206.6[#] *11*	(23/2$^-$)	C
7159.5[#] *11*	(27/2$^-$)	C

[†] From similarity to ^{45}Ti, except for g.s.. See also the footnote on J^{π} in (^{7}Li,2nγ).
[‡] Ground-state $T_{1/2}$ from 1988HaZB (^{46}V(p,2n); ms, chopper, tape; β^+, scin); others: 539 ms *18* (1982Ho11. ^{40}Ca(^{7}Li,2n); He-jet; 40.1γ), 0.61 s *8* (1982AlZP. ^{40}Ca(^{7}Li,2n); He-jet; 40.1γ), and 410 ms *50* (1980GrZY. ^{40}Ca(^{6}Li,n); pulsed beam). Excited-state $T_{1/2}$'s from $\gamma\gamma$(t) or nγ(t) in (^{7}Li,2nγ).
[#] Band(A): Band based on $f_{7/2}$ orbital, α=−1/2 (2006Be07).
[@] Band(B): Band based on $d_{3/2}$ orbital, α=−1/2 (2006Be07). 386, 797, an 1272 members of this band identified as possible members of a quasi-rotational band by 1980Gr04 based on a similar behavior to bands in ^{43}Sc, ^{43}Ti, and ^{45}Ti.
[&] Band(C): Band based on $d_{3/2}$ orbital, α=+1/2 (2006Be07).
[a] Band(D): Band based on $f_{7/2}$ orbital, α=+1/2 (2006Be07).

γ(^{45}V)

See β^+p decay for unplaced gammas.

E_γ	I_γ[†]	E_i(level)	J_i^{π}	E_f	J_f^{π}	Mult.	α[g]	$I_{(\gamma+ce)}$[‡]	Comments
(0.8[&])		56.8	(3/2$^-$)	56.7	(5/2$^-$)	M1,E2[a]	2876[b]	≈120[&]	
54.9[#] *9*		56.7	(5/2$^-$)	0.0	7/2$^-$	(M1)[@]	0.111 *6*	100[&]	ce(K)/(γ+ce)=0.090 *4*; ce(L)/(γ+ce)=0.0086 *5*; ce(M)/(γ+ce)=0.00113 *6*; ce(N+)/(γ+ce)=5.7×10^{-5} *3* ce(N)/(γ+ce)=5.7×10^{-5} *3* B(M1)(W.u.)>0.027
57.1[&] *8*		56.8	(3/2$^-$)	0.0	7/2$^-$	(E2)[c]	3.33 *20*	100[&]	ce(K)/(γ+ce)=0.685 *19*; ce(L)/(γ+ce)=0.074 *6*; ce(M)/(γ+ce)=0.0095 *7*; ce(N+)/(γ+ce)=0.00039 *3* ce(N)/(γ+ce)=0.00039 *3* B(E2)(W.u.)=24 *9*
329.1[hd] *2*	100[hd] *19*	385.9	(3/2$^+$)	56.8	(3/2$^-$)				
329.1[hd] *2*	100[hd] *19*	385.9	(3/2$^+$)	56.7	(5/2$^-$)				
378.0 *3*	38 *11*	3004.4	(15/2$^-$)	2626.3	(13/2$^-$)				
410.9 *4*	100 *26*	797.2	(5/2$^+$)	385.9	(3/2$^+$)				
465[i] *1*	<15	3910.2	(15/2$^+$)	3444.6	(13/2$^+$)				
475.02[e] *24*	49[f] *15*	1272.2	(7/2$^+$)	797.2	(5/2$^+$)				
572.7 *8*	42 *6*	2489.1	(11/2$^+$)	1916.5	(9/2$^+$)				
600.1 *2*	100 *6*	3604.5	(17/2$^-$)	3004.4	(15/2$^-$)				
644.0 *7*	38 *16*	1916.5	(9/2$^+$)	1272.2	(7/2$^+$)				
740.9[hd] *6*	63[hd] *12*	797.2	(5/2$^+$)	56.8	(3/2$^-$)				
740.9[hd] *6*	63[hd] *12*	797.2	(5/2$^+$)	56.7	(5/2$^-$)				
787.2 *3*	100	4391.7	(19/2$^-$)	3604.5	(17/2$^-$)				
885.90[e] *41*	63[f] *20*	1272.2	(7/2$^+$)	385.9	(3/2$^+$)				
952.9 *3*		7159.5	(27/2$^-$)	6206.6	(23/2$^-$)				
955[i] *1*	<100	3444.6	(13/2$^+$)	2489.1	(11/2$^+$)				
978.0 *5*	<5	3604.5	(17/2$^-$)	2626.3	(13/2$^-$)				

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Adopted Levels, Gammas (continued)

γ(^{45}V) (continued)

E_γ	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π
1119.5 *4*	100 *16*	1916.5	(9/2$^+$)	797.2	(5/2$^+$)
1163.9 *5*	100 *18*	2626.3	(13/2$^-$)	1462.0	(11/2$^-$)
1216.9 *4*	100 *11*	2489.1	(11/2$^+$)	1272.2	(7/2$^+$)
1272.6[f] *5*	100[f] *15*	1272.2	(7/2$^+$)	0.0	7/2$^-$
1302.0[i] *5*	29 *6*	2626.3	(13/2$^-$)	1324.0	(9/2$^-$)
1322.8[#] *5*	100	1324.0	(9/2$^-$)	0.0	7/2$^-$
1421 *1*	100 *10*	3910.2	(15/2$^+$)	2489.1	(11/2$^+$)
1462.0 *5*	100	1462.0	(11/2$^-$)	0.0	7/2$^-$
1528 *1*	<100	3444.6	(13/2$^+$)	1916.5	(9/2$^+$)
1542.6 *4*	100 *14*	3004.4	(15/2$^-$)	1462.0	(11/2$^-$)
1775.5 *7*		5685.7	(19/2$^+$)	3910.2	(15/2$^+$)
1814.9 *8*		6206.6	(23/2$^-$)	4391.7	(19/2$^-$)

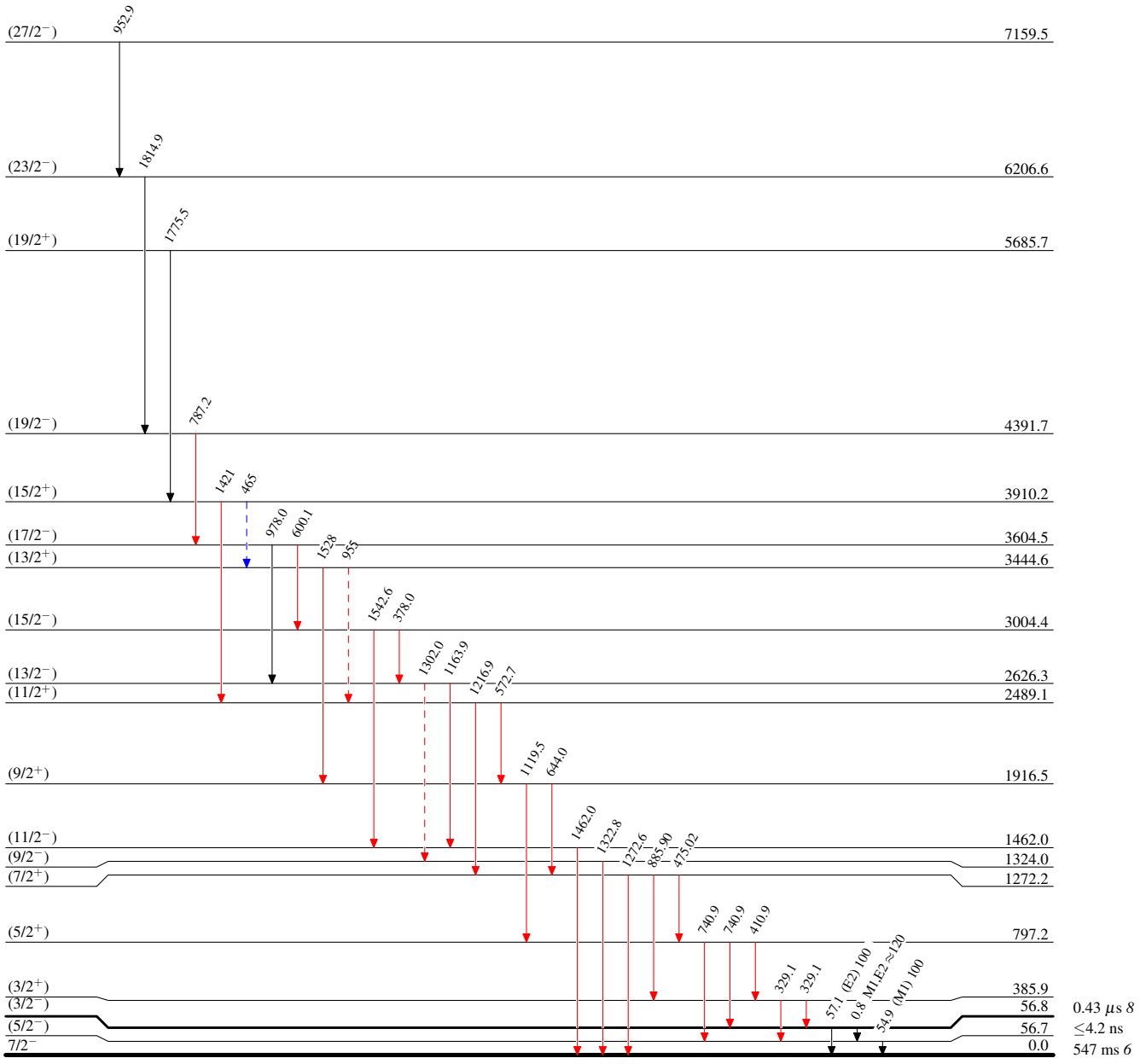
[†] Relative branching ratio from each level.
[‡] Relative I(γ+ce) branching ratio from each level.
[#] Weighted ave (ext.) of 54.4 keV *5* from β$^+$p decay and 56.3 keV *8* from (^{7}Li,2nγ) and of 1322.7 keV *3* from β$^+$ decay, 1322.7 keV *5* from β$^+$p decay, and 1324.0 keV *5* from (^{24}Mg,p2nγ).
[@] D from comparison to RUL. M1 from the level scheme.
[&] From (^{7}Li,2nγ).
[a] From comparison to RUL.
[b] From 1980Gr04 (M1 assumed. Code of 1975Pa26 used by 1980Gr04 to calculate α).
[c] D,E2 from comparison to RUL. ΔJ^π=2,no from the level scheme.
[d] The doublets at 329.1 and 740.9 were not resolved in (^{24}Mg,p2nγ); 2006Be07 assign average γ-ray energy and equal intensity. Other: 328.9 and 329.7 and unresolved 740 in (^{7}Li,2nγ).
[e] Weighted ave (int.) of 455.2 keV *3* from β$^+$p decay and 474.7 keV *4* from (^{24}Mg,p2nγ) and of 885.7 *7* from β$^+$p decay and 886.0 keV *5* from (^{24}Mg,p2nγ).
[f] From β$^+$p decay.
[g] 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.
[h] Multiply placed with intensity suitably divided.
[i] Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Level Scheme

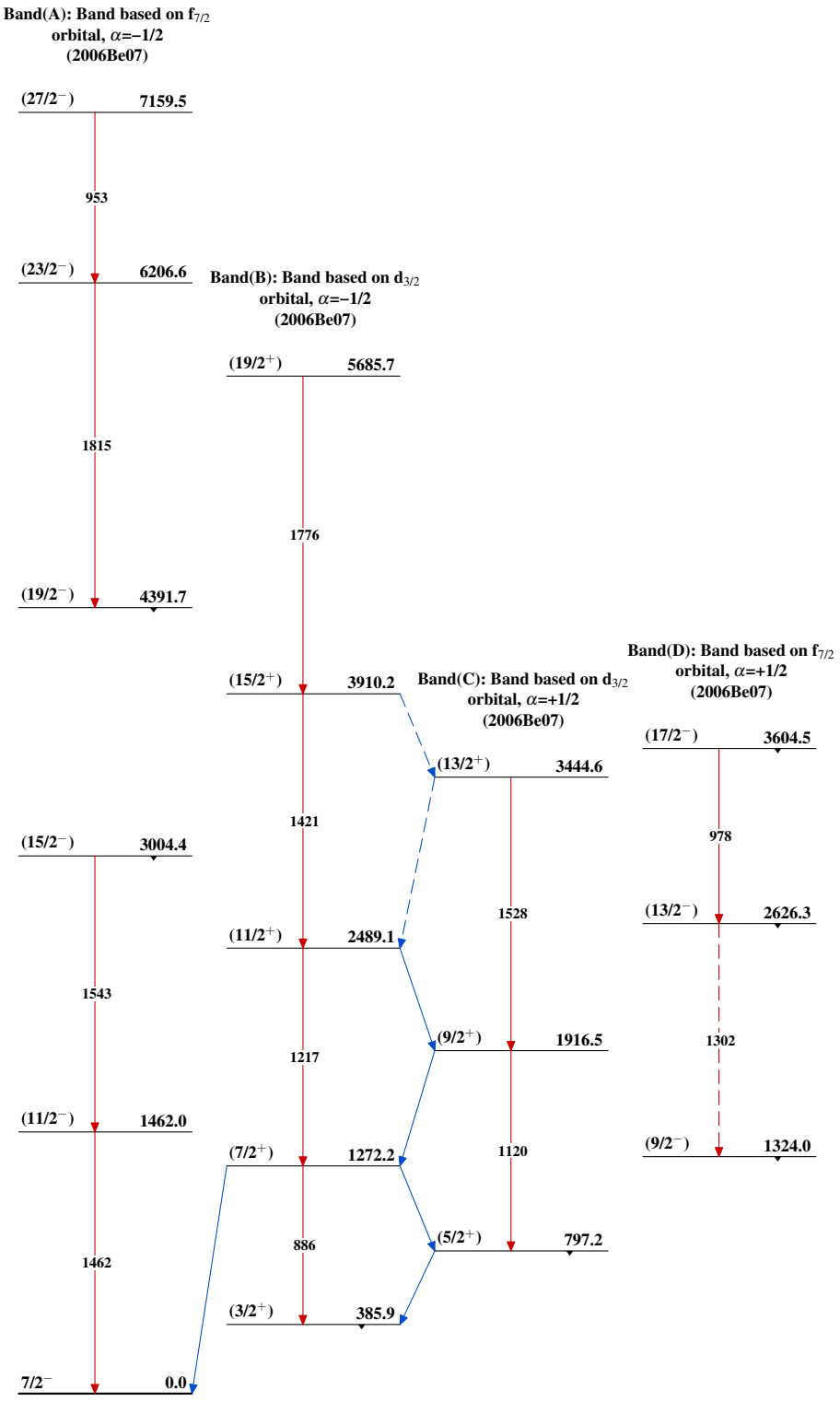
Intensities: Relative I(γ+ce) branching ratio from each level

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



$^{45}_{23}V_{22}$

Adopted Levels, Gammas



$^{45}_{23}V_{22}$