^{56}Fe(^{35}Cl,2pnγ) 1995Sc37

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan and A. A. Sonzogni	NDS 115, 135 (2014)	1-Nov-2013

E(^{35}Cl)=123 MeV; measured Eγ, Iγ, $\gamma\gamma$, and $\gamma\gamma$-n coincidences using eight Ge detectors (without anti-Compton shields) and a four-segment NE213 neutron detector. In a second experiment E(^{35}Cl)=120 MeV; measured Eγ, Iγ, $\gamma\gamma$ and $\gamma\gamma(\theta)$ (DCO) using six Compton-suppressed Ge detectors.

^{88}Nb Levels

All levels are interpreted in terms of the shell-model using the ($p_{1/2}$,$g_{9/2}$) configuration space for proton particles and neutron holes. See 1995Sc37 for detailed configurations for each level.

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0@	8^+	2770.33@ *25*	(13^+)	3965.7?# *5*		6264.3& *5*	(19^-)
610.0@ *3*	(9^+)	2967.0& *3*	(13^-)	3998.3 *3*	(15^+)	6331.5@ *5*	(19^+)
1089.41@ *10*	(10^+)	3085.4 *3*	(13^+)	4086.0& *4*	(15^-)	6590.6?# *8*	
1553.8& *3*	(9^-)	3096.5 *3*	(13^-)	4391.7 *4*	(15^-)	6795.5 *7*	
1675.71@ *19*	(11^+)	3206.9 *3*	(13^-)	4707.7& *4*	(16^-)	6811.7 *7*	
2006.20& *19*	(11^-)	3296.8 *5*		4885.4@ *4*	(16^+)	7017.7 *8*	
2077.33@ *20*	(12^+)	3442.2@ *3*	(14^+)	5075.0@ *4*	(17^+)	7163.0 *8*	
2216.8 *3*	(11^-)	3626.1& *3*	(14^-)	5111.2 *7*		7335.8 *6*	
2483.0 *4*	(12^+)	3667.2 *3*	(14^+)	5114.1& *4*	(17^-)	7717.8 *8*	
2553.69& *24*	(12^-)	3671.4@ *3*	(15^+)	5433.0& *5*	(18^-)	7924.4 *8*	
2717.0 *3*	(12^-)	3733.7 *4*	(14^-)	5589.3 *15*		9737.2 *17*	

† From a least-squares fit to Eγ by evaluators.
‡ As proposed in 1995Sc37 based on R(DCO) values and γ cascade patterns.
# Ordering of populating and depopulating transitions used to construct the level is uncertain.
@ Band(A): Positive parity yrast sequence.
& Band(B): Negative parity yrast sequence.

γ(^{88}Nb)

All DCOs are gated by stretched quadrupole transitions. Expected values are R(DCO)=1 for stretched quadrupole transitions, ≈0.5 for ΔJ=1 transitions and ≈1 for ΔJ=0 transitions.

Eγ	Iγ	Ei(level)	J_i^π	E_f	J_f^π	Mult.†	Comments
189.6 *3*	19 *1*	5075.0	(17^+)	4885.4	(16^+)	D	R(DCO)=0.60 *1*.
210.6 *2*	62 *1*	2216.8	(11^-)	2006.20	(11^-)	(D+Q)	R(DCO)=0.88 *3*. Mult.: R(DCO) consistent with ΔJ=0 transition.
229.2 *2*	103 *1*	3671.4	(15^+)	3442.2	(14^+)	D	R(DCO)=0.59 *1*.
232.0‡ *4*	21 *1*	3965.7?		3733.7	(14^-)		
250.0 *5*	7 *1*	2967.0	(13^-)	2717.0	(12^-)		
315.1 *6*	10 *1*	3085.4	(13^+)	2770.33	(13^+)		
316.1 *2*	65 *1*	4707.7	(16^-)	4391.7	(15^-)	D	R(DCO)=0.57 *5*.
318.2 *5*	7 *1*	7335.8		7017.7			
318.9 *3*	52 *1*	5433.0	(18^-)	5114.1	(17^-)	D	R(DCO)=0.56 *3*.
326.9 *5*	12 *1*	3998.3	(15^+)	3671.4	(15^+)		

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^{56}Fe(^{35}Cl,2pnγ) 1995Sc37 (continued)

γ(^{88}Nb) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
330.5 *4*	45 *1*	2006.20	(11$^-$)	1675.71	(11$^+$)		
331.1 *3*	89 *1*	3998.3	(15$^+$)	3667.2	(14$^+$)	D	R(DCO)=0.56 *2*.
336.9 *5*	9 *1*	2553.69	(12$^-$)	2216.8	(11$^-$)		
356.8 *3*	60 *1*	3442.2	(14$^+$)	3085.4	(13$^+$)	D	R(DCO)=0.57 *3*.
367.5 *5*	21 *1*	7163.0		6795.5			
370.4 *5*	10 *1*	3667.2	(14$^+$)	3296.8			
379.4 *6*	16 *1*	3096.5	(13$^-$)	2717.0	(12$^-$)		
382.0 *5*	18 *1*	7717.8		7335.8			
401.7 *10*	5 *1*	2077.33	(12$^+$)	1675.71	(11$^+$)		
403.5 *7*	29 *1*	5111.2		4707.7	(16$^-$)		
405.7 *5*	25 *1*	2483.0	(12$^+$)	2077.33	(12$^+$)		
406.4 *2*	116 *1*	5114.1	(17$^-$)	4707.7	(16$^-$)	D	R(DCO)=0.45 *1*.
413.3 *2*	130 *1*	2967.0	(13$^-$)	2553.69	(12$^-$)	D	R(DCO)=0.56 *1*.
419.2 *3*	42 *1*	3626.1	(14$^-$)	3206.9	(13$^-$)	D	R(DCO)=0.53 *3*.
427.1[‡] *5*	10 *1*	7017.7		6590.6?			
452.4 *4*	49 *1*	2006.20	(11$^-$)	1553.8	(9$^-$)		
459.9 *5*	39 *1*	4086.0	(15$^-$)	3626.1	(14$^-$)	D	R(DCO)=0.49 *3*.
464.3 *6*	16 *1*	1553.8	(9$^-$)	1089.41	(10$^+$)		
479.4 *5*	10 *1*	1089.41	(10$^+$)	610.0	(9$^+$)		
480.2 *5*	10 *1*	6811.7		6331.5	(19$^+$)		
489.9 *5*	6 *1*	3206.9	(13$^-$)	2717.0	(12$^-$)		
500.2 *3*	27 *1*	2717.0	(12$^-$)	2216.8	(11$^-$)	D	R(DCO)=0.45 *11*.
531.2 *6*	4 *1*	6795.5		6264.3	(19$^-$)		
542.8 *4*	78 *1*	3096.5	(13$^-$)	2553.69	(12$^-$)	D	R(DCO)=0.46 *2*.
547.5 *2*	299 *3*	2553.69	(12$^-$)	2006.20	(11$^-$)	D	R(DCO)=0.52 *1*.
586.3 *2*	82 *2*	1675.71	(11$^+$)	1089.41	(10$^+$)	D	R(DCO)=0.48 *2*.
602.5 *7*	26 *1*	3085.4	(13$^+$)	2483.0	(12$^+$)	D	R(DCO)=0.61 *5*.
610.0 *8*	43 *1*	610.0	(9$^+$)	0.0	8$^+$		
621.7 *6*	14 *1*	4707.7	(16$^-$)	4086.0	(15$^-$)		
637.2 *5*	42 *1*	3733.7	(14$^-$)	3096.5	(13$^-$)	D	R(DCO)=0.43 *3*.
653.2 *4*	63 *1*	3206.9	(13$^-$)	2553.69	(12$^-$)	D	R(DCO)=0.42 *2*.
657.9 *5*	12 *1*	4391.7	(15$^-$)	3733.7	(14$^-$)		
659.1 *3*	104 *1*	3626.1	(14$^-$)	2967.0	(13$^-$)	D	R(DCO)=0.50 *2*.
671.9 *3*	63 *1*	3442.2	(14$^+$)	2770.33	(13$^+$)	D	R(DCO)=0.51 *3*.
693.0 *2*	252 *3*	2770.33	(13$^+$)	2077.33	(12$^+$)	D	R(DCO)=0.49 *1*.
710.8 *4*	28 *1*	2717.0	(12$^-$)	2006.20	(11$^-$)	D	R(DCO)=0.52 *5*.
742.0[‡] *5*	22 *1*	4707.7	(16$^-$)	3965.7?			
761.4 *5*	17 *1*	7924.4		7163.0			
765.6 *5*	37 *1*	4391.7	(15$^-$)	3626.1	(14$^-$)	D	R(DCO)=0.48 *3*.
766.8 *5*	22 *1*	3733.7	(14$^-$)	2967.0	(13$^-$)		
831.2 *5*	46 *1*	6264.3	(19$^-$)	5433.0	(18$^-$)	D	R(DCO)=0.37 *3*.
879.7 *6*	7 *1*	3096.5	(13$^-$)	2216.8	(11$^-$)		
887.1 *5*	12 *1*	4885.4	(16$^+$)	3998.3	(15$^+$)	D	R(DCO)=0.58 *8*.
889.6 *5*	17 *1*	2967.0	(13$^-$)	2077.33	(12$^+$)		
896.8 *3*	78 *1*	3667.2	(14$^+$)	2770.33	(13$^+$)	D	R(DCO)=0.56 *3*.
901.1 *5*	30 *1*	3671.4	(15$^+$)	2770.33	(13$^+$)	Q	R(DCO)=1.07 *11*.
912.8 *7*	20 *1*	3998.3	(15$^+$)	3085.4	(13$^+$)		
916.8 *2*	378 *4*	2006.20	(11$^-$)	1089.41	(10$^+$)	D	R(DCO)=0.60 *1*. Mult.: E1 proposed in 1995Sc37 based on a stretched D from R(DCO) and decay of similar level in ^{90}Tc.
943.7 *6*	18 *1*	1553.8	(9$^-$)	610.0	(9$^+$)		
960.8 *5*	31 *1*	2967.0	(13$^-$)	2006.20	(11$^-$)	Q	R(DCO)=0.94 *10*.
987.9 *2*	490 *5*	2077.33	(12$^+$)	1089.41	(10$^+$)	Q	R(DCO)=0.96 *2*.
1004.3 *5*	29 *1*	7335.8		6331.5	(19$^+$)		
1008.1 *5*	61 *1*	3085.4	(13$^+$)	2077.33	(12$^+$)	D	R(DCO)=0.47 *4*.

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^{56}Fe(^{35}Cl,2pnγ) 1995Sc37 (continued)

γ(^{88}Nb) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
1028.1 *7*	11 *1*	5114.1	(17$^-$)	4086.0	(15$^-$)		
1065.7 *5*	15 *1*	1675.71	(11$^+$)	610.0	(9$^+$)		
1072.4 *5*	16 *1*	3626.1	(14$^-$)	2553.69	(12$^-$)		
1076.7 *2*	123 *1*	5075.0	(17$^+$)	3998.3	(15$^+$)	Q	R(DCO)=0.93 *7*.
1081.6 *5*	55 *1*	4707.7	(16$^-$)	3626.1	(14$^-$)	Q	R(DCO)=1.19 *11*.
1089.4 *1*	1000 *8*	1089.41	(10$^+$)	0.0	8$^+$	Q	R(DCO)=1.04 *2*.
1094.6 *5*	25 *1*	2770.33	(13$^+$)	1675.71	(11$^+$)	Q	R(DCO)=1.01 *17*.
1119.0 *7*	5 *1*	4086.0	(15$^-$)	2967.0	(13$^-$)		
1150.1 *5*	5 *1*	6264.3	(19$^-$)	5114.1	(17$^-$)		
1184.2 *10*	9 *1*	3667.2	(14$^+$)	2483.0	(12$^+$)		
1214.0 *7*	9 *1*	4885.4	(16$^+$)	3671.4	(15$^+$)		
1218.3 *7*	8 *1*	4885.4	(16$^+$)	3667.2	(14$^+$)		
1219.4 *10*	20 *1*	3296.8		2077.33	(12$^+$)		
1228.0 *5*	76 *1*	3998.3	(15$^+$)	2770.33	(13$^+$)	Q	R(DCO)=0.99 *6*.
1256.5 *3*	89 *3*	6331.5	(19$^+$)	5075.0	(17$^+$)	Q	R(DCO)=1.01 *3*.
1295.2 *7*	26 *1*	4391.7	(15$^-$)	3096.5	(13$^-$)	Q	R(DCO)=0.98 *14*.
1364.9 *7*	33 *1*	3442.2	(14$^+$)	2077.33	(12$^+$)	Q	R(DCO)=1.11 *12*.
1393.6 *7*	44 *2*	2483.0	(12$^+$)	1089.41	(10$^+$)	Q	R(DCO)=0.90 *9*.
1403.6 *5*	41 *1*	5075.0	(17$^+$)	3671.4	(15$^+$)	Q	R(DCO)=0.92 *3*.
1409.8 *12*	7 *1*	3085.4	(13$^+$)	1675.71	(11$^+$)		
1424.7 *7*	18 *1*	4391.7	(15$^-$)	2967.0	(13$^-$)		
1515.6[‡] *12*	10 *1*	6590.6?		5075.0	(17$^+$)		
1553.7 *10*	29 *2*	1553.8	(9$^-$)	0.0	8$^+$		
1589.8 *12*	8 *1*	3667.2	(14$^+$)	2077.33	(12$^+$)		
1660.1 *10*	12 *1*	7924.4		6264.3	(19$^-$)		
1681.3 *12*	15 *1*	6795.5		5114.1	(17$^-$)		
1684.2 *12*	9 *1*	6795.5		5111.2			
1812.8 *15*	8 *1*	9737.2		7924.4			
1917.9 *15*	8 *1*	5589.3		3671.4	(15$^+$)		

[†] From R(DCO) values.
[‡] Placement of transition in the level scheme is uncertain.

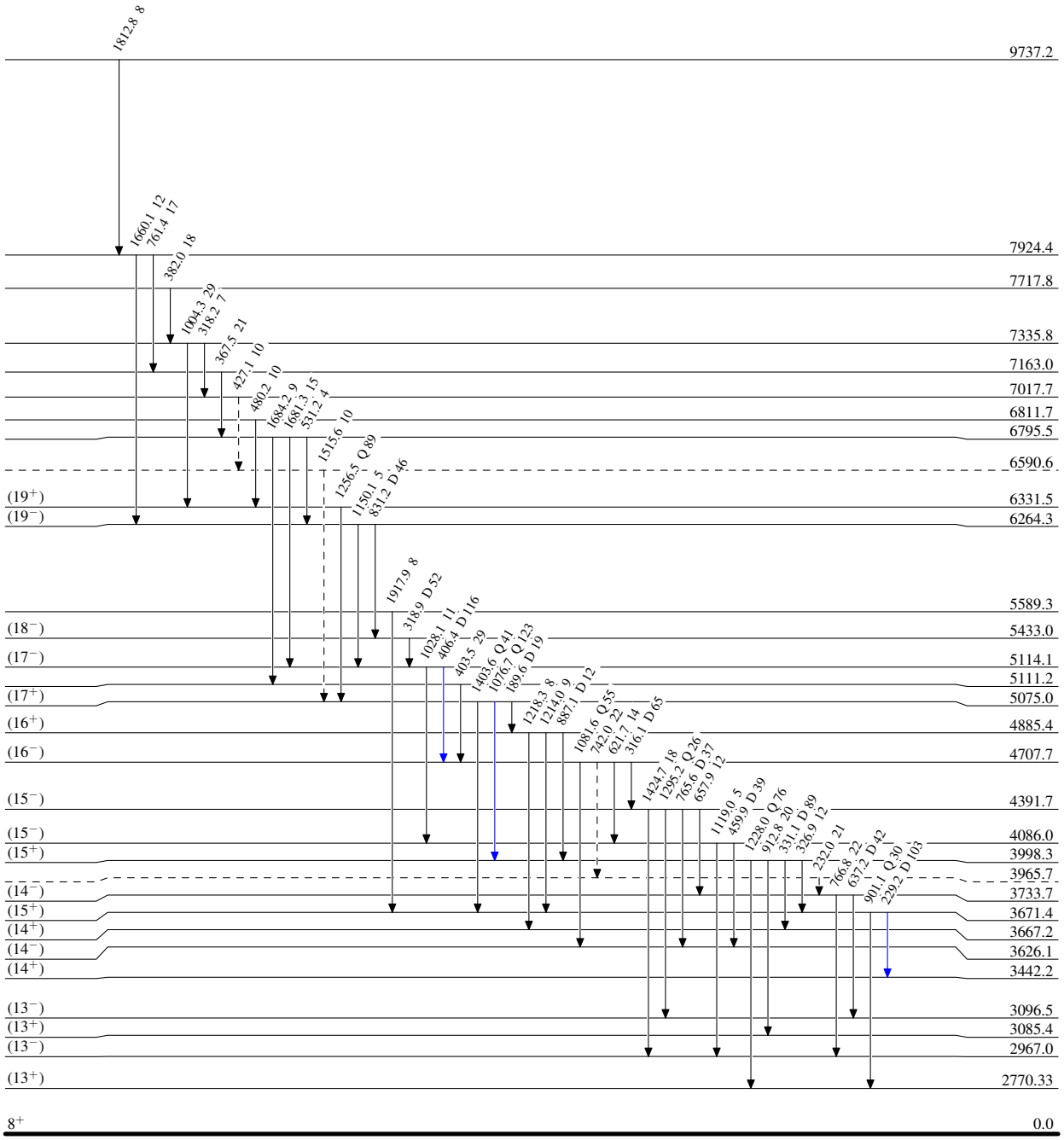
^{56}Fe(^{35}Cl,2pnγ) 1995Sc37

Level Scheme

Intensities: Relative I_γ

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)



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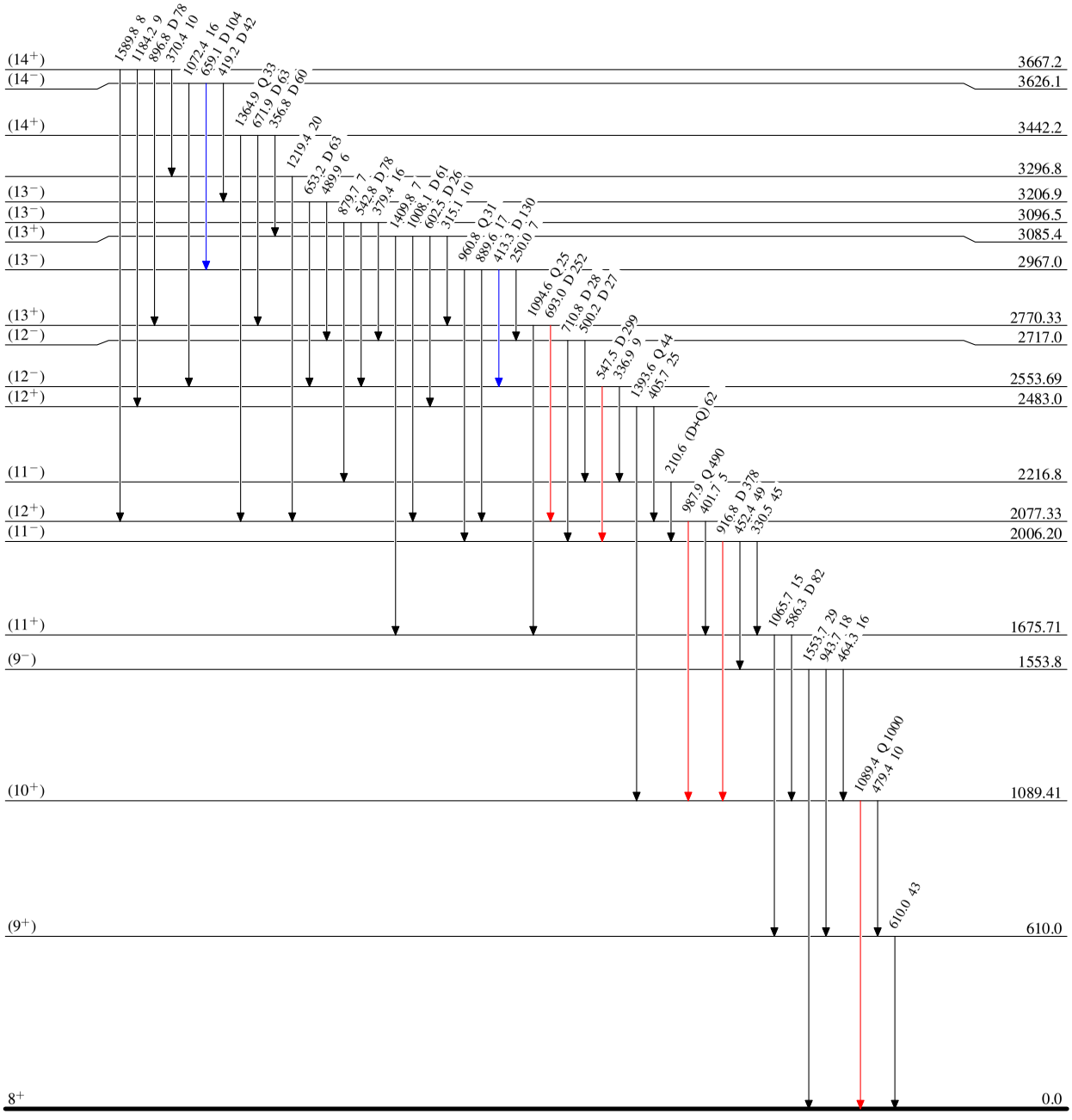
Level Scheme (continued)

Intensities: Relative I_γ

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$



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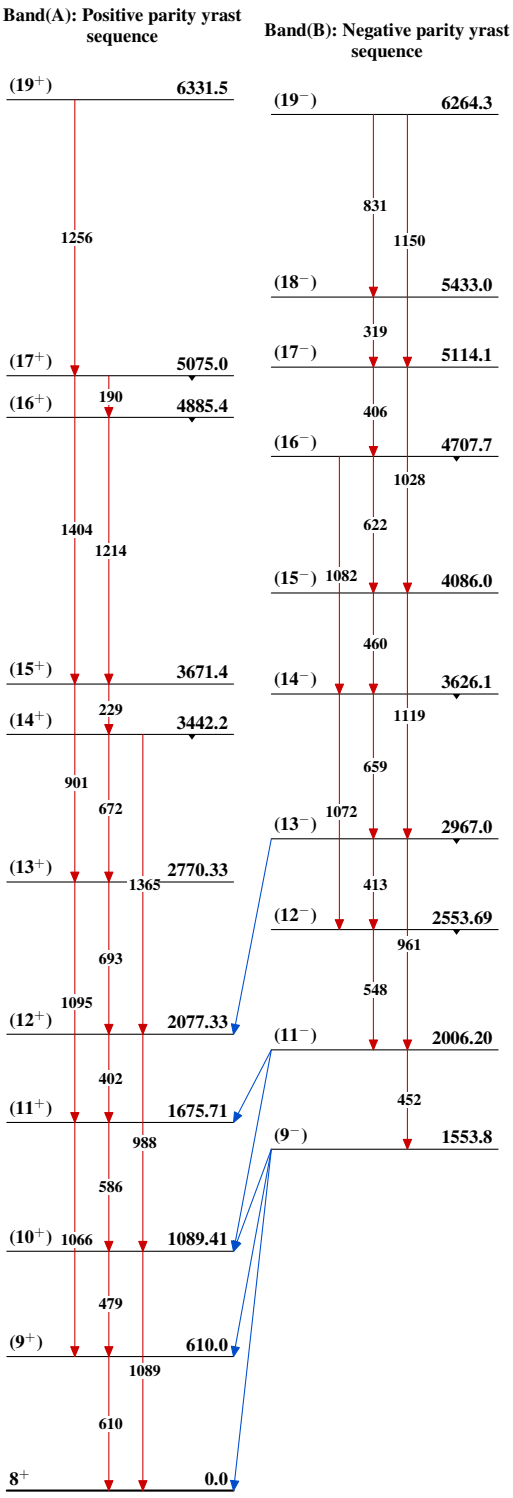

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