^{109}Ag(^{16}O,3nγ),^{94}Mo(^{31}P,2pnγ) 2000Mo16,1998Sm07

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	T. Tamura	NDS 108, 455 (2007)	30-Sep-2006

Compiled by evaluator using Eγ's, Iγ's and DCO's from 2000Mo16, with Eγ's from (24^+), (26^+), (28^+) members for band 1, (25^+), (27^+) members for band 2 from 1998Sm07.

See also ^{107}Ag(^{19}F,p3nγ) and ^{112}Sn(^{12}C,pnγ).

1998Sm07: ^{94}Mo(^{31}P,2pnγ) E(^{31}P)=127 MeV; measured Eγ, Iγ and $\gamma\gamma$-coin. But no numerical data are presented, except Eγ (ΔEγ=1 keV) and band structures in Fig.1. Proposed band structures consisting of π=(+) band up to (28^+), and π=− up to (21^-) on the basis of B(M1)/B(E2) and comparison with band structures in ^{118}I, ^{118,120,124,126}Cs, and ^{124,126,128}La.

2000Mo16: ^{109}Ag(^{16}O,3nγ) E=80 MeV, Array of Compton suppressed HP Ge and LEPS detectors; Eγ, Iγ and DCO ratios, $\gamma\gamma$-coincidence; Deduced levels J^π, experimental Routhian surface calculations, cranking shell model calculations. Band 1 through band 6 are assigned.

Other in-beam γ spectroscopy: 1986Qu01: ^{109}Ag(^{18}O,5nγ) E(^{18}O)=96 MeV; semi γ, $\gamma\gamma$-coin, $\gamma\gamma$(t), excitation functions.

^{122}Cs Levels

E(level)	J^π[#]	Comments
0.0	1^+	
140[‡][b] *30*	$8^{(-)}$	Additional information 1.
235.30[c] *14*	(9^-)	
272.30[a] *16*	(9^+)[@]	
323.5[&] *4*	(10^+)[@]	
365.60[b] *16*	(10^-)	
426.8[a] *4*	(11^+)	
453.8 *4*	(10^-)	
508.1[&] *4*	(12^+)	
568.90[c] *21*	(11^-)	
787.60[b] *22*	(12^-)	
814.3[a] *4*	(13^+)	
891.5[e] *4*	(11^-)	
909.4 *4*	(11^-)	
980.7[&] *4*	(14^+)	
1055.6[d] *4*	(13^+)	
1072.5[c] *3*	(13^-)	
1082.7[f] *5*	(12^-)	
1358.2[e] *4*	(13^-)	
1361.1[b] *3*	(14^-)	
1373.2[a] *4*	(15^+)	
1632.4[d] *5*	(15^+)	
1640.0[&] *4*	(16^+)	
1699.5[f] *6*	(14^-)	
1707.3[c] *4*	(15^-)	
1937.7[e] *6*	(15^-)	
2051.7[b] *4*	(16^-)	
2077.7[a] *5*	(17^+)	
2368.6[d] *6*	(17^+)	
2398.6[f] *8*	(16^-)	
2444.1[c] *4*	(17^-)	
2454.3[&] *5*	(18^+)	

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^{109}Ag(^{16}O,3nγ),^{94}Mo(^{31}P,2pnγ) 2000Mo16,1998Sm07 (continued)

^{122}Cs Levels (continued)

E(level)	J$^\pi$#	E(level)	J$^\pi$#	E(level)	J$^\pi$#	E(level)	J$^\pi$#
2623.9[e] 7	(17$^-$)	3391.8[&] 5	(20$^+$)	4287.4 9	(21$^-$)	5699?[†b] 4	(24$^-$)
2836.6[b] 5	(18$^-$)	3407.1[e] 8	(19$^-$)	4426.6[&] 6	(22$^+$)	5965[†a] 3	(25$^+$)
2909.5[a] 5	(19$^+$)	3706.8[b] 5	(20$^-$)	4652.9[b] 7	(22$^-$)	6673[†&] 5	(26$^+$)
3194.1[f] 9	(18$^-$)	3849.2[a] 6	(21$^+$)	4874.5[a] 6	(23$^+$)	7105?[†a] 5	(27$^+$)
3234.4[d] 7	(19$^+$)	4156.9[c] 5	(21$^-$)	5121.3[c] 7	(23$^-$)	7873?[†&] 5	(28$^+$)
3263.1[c] 5	(19$^-$)	4279.8[e] 9	(21$^-$)	5532[†&] 3	(24$^+$)		

[†] From 1998Sm07.
[‡] Mass difference of the g.s. and this isomers.
[#] Based on the band structures built on 8$^{(-)}$, (140 keV *30*) state,
[@] There have been made discrepant spin assignments for the the band 1 and band 2, namely, base level at 324 keV as (10$^+$), and 272 keV as (9$^+$) by 2000Mo16 (1998Sm07,2005Ku34); while the 324 keV as (8$^+$), and the 272 keV as (7$^+$) by 2005Uu01 (1996Li13). Both choices appear to fit smooth-energy spacing trend as discussed in 1998Sm07, 1996Li13 and 2005Uu01. Evaluator takes the assignments of 2000Mo16 (1998Sm07,2005Ku34).
[&] Band(A): band 1, $\pi h_{11/2}\otimes\nu h_{11/2}$, α=0.
[a] Band(a): band 2, $\pi h_{11/2}\otimes\nu h_{11/2}$, α=1.
[b] Band(B): band 3, $\pi h_{11/2}\otimes\nu d_{5/2}$, α=0.
[c] Band(b): band 4, $\pi h_{11/2}\otimes\nu d_{5/2}$, α=1.
[d] Band(C): band 5, Band based on (13$^+$).
[e] Band(D): band 6, Band based on (11$^-$).
[f] Band(E): band 7, Band based on (12$^-$).

γ(^{122}Cs)

E$_i$(level)	J$_i^\pi$	E$_\gamma$[†]	I$_\gamma$[#]	E$_f$	J$_f^\pi$	Mult.[@]	Comments
235.30	(9$^-$)	95.3 *2*	71 *4*	140	8$^{(-)}$	D(+Q)	Mult.: DCO(f)=0.9 *2*.
272.30	(9$^+$)	37.0 *2*		235.30	(9$^-$)		observed only in coincidence spectra with the 95 γ. I$_\gamma$: No value given.
		132.3 *2*	100	140	8$^{(-)}$	E1	Mult.: DCO(d)=0.7 *2*; 2000Mo16 deduced E1 from angular distribution and linear polarization.
323.5	(10$^+$)	51.2 *4*	7.9 *11*	272.30	(9$^+$)	(D+Q)	Mult.: conversion coefficient deduced from intensity balance at 323.5 keV requires mult.=E2(+M1).
365.60	(10$^-$)	130.3 *2*	30.3 *15*	235.30	(9$^-$)	D(+Q)	Mult.: DCO(d)=0.6 *2*.
		225.6 *2*	1.8 *3*	140	8$^{(-)}$	Q	Mult.: evaluator assumes the DCO value given as 2.3 by 2000Mo16 is DCO(d) value because 225.6γ is parallel with 132.3 E1 gating γ.
426.8	(11$^+$)	103.3 *2*	87 *4*	323.5	(10$^+$)	D(+Q)	Mult.: DCO(e)=0.7 *2*.
		154.5 *4*	2.9 *4*	272.30	(9$^+$)	Q	Mult.: DCO(e)=2.0 *8*.
453.8	(10$^-$)	218.5 *4*	4.4 *7*	235.30	(9$^-$)	D	E$_\gamma$: doublet of 218.5 and 218.7. Mult.: DCO(g)=0.9 *4*.
508.1	(12$^+$)	81.3 *2*	52 *3*	426.8	(11$^+$)	D(+Q)	Mult.: DCO(e)=0.9 2.
		184.6 *2*	5.2 *8*	323.5	(10$^+$)	Q	Mult.: DCO(e)=1.6 *6*.
568.90	(11$^-$)	203.3 *2*	24.5 *12*	365.60	(10$^-$)	D(+Q)	Mult.: DCO(f)=0.9 *2*.
		333.6 *4*	3.1 *5*	235.30	(9$^-$)	Q	Mult.: DCO(g)=2.0 *8*.
787.60	(12$^-$)	218.7 *2*	10.0 *5*	568.90	(11$^-$)	D(+Q)	E$_\gamma$: doublet of 218.5 and 218.7. Mult.: DCO(f)=1.0 *3*.
		422.0 *2*	10.2 *5*	365.60	(10$^-$)	Q	Mult.: DCO(f)=1.7 *4*.
814.3	(13$^+$)	306.2 *2*	57 *3*	508.1	(12$^+$)	D(+Q)	Mult.: DCO(e)=0.5 *1*.

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^{109}Ag(^{16}O,3nγ),^{94}Mo(^{31}P,2pnγ) 2000Mo16,1998Sm07 (continued)

γ(^{122}Cs) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[#]	E_f	J_f^π	Mult.[@]	Comments
814.3	(13$^+$)	387.5 *4*	6.0 *9*	426.8	(11$^+$)	Q	Mult.: DCO(e)=1.7 *7*.
891.5	(11$^-$)	525.9 *4*	3.9 *6*	365.60	(10$^-$)	D	Mult.: DCO(f)=1.0 *4*.
909.4	(11$^-$)	455.6 *4*	4.3 *6*	453.8	(10$^-$)	D	E_γ: doublet of 455.2 and 455.6. Mult.: DCO(h)=0.4 *2*.
		543.8 *4*	4.1 *6*	365.60	(10$^-$)	D	Mult.: DCO(f)=0.9 *4*.
980.7	(14$^+$)	166.4 *2*	29.5 *15*	814.3	(13$^+$)	D(+Q)	Mult.: DCO(e)=0.8 *2*.
		472.6 *2*	73 *4*	508.1	(12$^+$)	Q	Mult.: DCO(e)=1.5 *4*.
1055.6	(13$^+$)	547.5 *2*	11.7 *6*	508.1	(12$^+$)	D(+Q)	Mult.: DCO(e)=0.7 *2*.
1072.5	(13$^-$)	284.9 *2*	10.2 *5*	787.60	(12$^-$)	D(+Q)	Mult.: DCO(f)=0.9 *2*.
		503.6 *4*	6.3 *10*	568.90	(11$^-$)	Q	Mult.: DCO(f)=2.1 *8*.
1082.7	(12$^-$)	513.8 *4*	1.6 *3*	568.90	(11$^-$)	D	Mult.: DCO(f)=0.6 *3*.
1358.2	(13$^-$)	448.8 *4*	3.6 *5*	909.4	(11$^-$)	Q	Mult.: DCO(f)=1.6 *6*.
		466.7 *4*		891.5	(11$^-$)		E_γ: only presented in the level scheme, no Iγ value given.
1361.1	(14$^-$)	288.6 *4*	5.9 *9*	1072.5	(13$^-$)	D(+Q)	Mult.: DCO(f)=0.8 *3*.
		573.5 *2*	10.5 *6*	787.60	(12$^-$)	Q	Mult.: DCO(f)=1.9 *5*.
1373.2	(15$^+$)	392.5[&] *3*	35.0[&]	980.7	(14$^+$)	D(+Q)	E_γ: triplet of 392.4, 392.5 and 392.6. Mult.: DCO(f)=0.6 *3*.
		558.9 *2*	13.8 *7*	814.3	(13$^+$)	Q	Mult.: DCO(e)=1.3 *3*.
1632.4	(15$^+$)	576.8 *4*	5.0 *8*	1055.6	(13$^+$)	Q	Mult.: DCO(e)=1.6 *6*.
		651.7 *2*	11.1 *6*	980.7	(14$^+$)	D(+Q)	Mult.: DCO(f)=0.8 *3*.
1640.0	(16$^+$)	266.8 *4*	5.1 *8*	1373.2	(15$^+$)	D(+Q)	Mult.: DCO(e)=0.7 *3*.
		659.3 *2*	57.2 *28*	980.7	(14$^+$)	Q	Mult.: DCO(e)=1.5 *4*.
1699.5	(14$^-$)	616.8 *4*	1.9 *3*	1082.7	(12$^-$)	Q	Mult.: DCO(f)=3.0 *12*.
1707.3	(15$^-$)	346.2 *3*	4.7 *7*	1361.1	(14$^-$)	D(+Q)	Mult.: DCO(f)=0.8 *3*.
		634.8 *4*	7.6 *10*	1072.5	(13$^-$)	Q	Mult.: DCO(f)=2.2 *8*.
1937.7	(15$^-$)	579.5 *4*	5.8 *10*	1358.2	(13$^-$)	Q	Mult.: DCO(f)=1.8 *7*.
2051.7	(16$^-$)	344.4 *4*	3.8 *6*	1707.3	(15$^-$)	D(+Q)	Mult.: DCO(f)=0.8 *3*.
		690.6 *4*	8.1 *12*	1361.1	(14$^-$)	Q	Mult.: DCO(f)=2.2 *9*.
2077.7	(17$^+$)	437.7 *2*	14.2 *7*	1640.0	(16$^+$)	D(+Q)	Mult.: DCO(e)=0.6 *2*.
		704.5 *2*	11.4 *6*	1373.2	(15$^+$)	Q	Mult.: DCO(e)=1.5 *4*.
2368.6	(17$^+$)	736.2 *4*	4.7 *8*	1632.4	(15$^+$)	Q	E_γ: doublet of 736.2 and 736.8. Mult.: DCO(e)=1.7 *7*.
2398.6	(16$^-$)	699.1 *4*	2.7 *4*	1699.5	(14$^-$)	Q	Mult.: DCO(f)=2.7 *10*.
2444.1	(17$^-$)	392.4[&] *2*	35.0[&] *18*	2051.7	(16$^-$)	D(+Q)	E_γ: triplet of 392.4, 392.5 and 392.6. Mult.: DCO(f)=0.7 *2*.
		736.8 *4*	9.8 *15*	1707.3	(15$^-$)	Q	E_γ: doublet of 736.2 and 736.8. Mult.: DCO(f)=1.7 *7*.
2454.3	(18$^+$)	814.3 *2*	24.1 *12*	1640.0	(16$^+$)	Q	Mult.: DCO(e)=1.8 *4*.
2623.9	(17$^-$)	686.2 *4*	5.8 *10*	1937.7	(15$^-$)	Q	Mult.: DCO(f)=1.8 *7*.
2836.6	(18$^-$)	392.5[&] *4*	35.0[&]	2444.1	(17$^-$)	D(+Q)	E_γ: triplet of 392.4, 392.5 and 392.6. Mult.: DCO(e)=0.7 *2*.
		784.9 *4*	6.3 *10*	2051.7	(16$^-$)	Q	Mult.: DCO(f)=2.2 *9*.
2909.5	(19$^+$)	455.2 *4*	4.8 *7*	2454.3	(18$^+$)	D(+Q)	E_γ: doublet of 455.2 and 455.6. Mult.: DCO(e)=0.5 *2*.
		831.8 *4*	6.9 *10*	2077.7	(17$^+$)	Q	Mult.: DCO(e)=2.8 *12*.
3194.1	(18$^-$)	795.5 *4*	0.8 *2*	2398.6	(16$^-$)		
3234.4	(19$^+$)	865.8 *4*	1.7 *3*	2368.6	(17$^+$)	Q	Mult.: DCO(e)=1.6 *6*.
3263.1	(19$^-$)	426.5 *4*	4.1 *6*	2836.6	(18$^-$)	D(+Q)	Mult.: DCO(f)=0.7 *3*.
		819.0 *3*	5.9 *10*	2444.1	(17$^-$)	Q	Mult.: DCO(f)=1.7 *7*.
3391.8	(20$^+$)	937.5 *2*	10.5 *5*	2454.3	(18$^+$)	Q	Mult.: DCO(e)=2.6 *6*.
3407.1	(19$^-$)	783.2 *4*	4.8 *8*	2623.9	(17$^-$)	Q	Mult.: DCO(f)=1.7 *7*.
3706.8	(20$^-$)	443.7 *2*	2.5 *4*	3263.1	(19$^-$)		
		870.2 *4*	4.8 *8*	2836.6	(18$^-$)	Q	Mult.: DCO(f)=1.6 *7*.
3849.2	(21$^+$)	457.4 *4*	1.3 *2*	3391.8	(20$^+$)	D(+Q)	Mult.: DCO(e)=0.6 *3*.
		939.7 *4*	5.6 *9*	2909.5	(19$^+$)	Q	Mult.: DCO(e)=1.9 *8*.

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^{109}Ag(^{16}O,3nγ),^{94}Mo(^{31}P,2pnγ) 2000Mo16,1998Sm07 (continued)

γ(^{122}Cs) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[#]	E_f	J_f^π	Mult.[@]	Comments
4156.9	(21$^-$)	893.8 *2*	2.5 *4*	3263.1	(19$^-$)	Q	Mult.: DCO(f)=2.0 *8*.
4279.8	(21$^-$)	872.7 *4*	0.8 *2*	3407.1	(19$^-$)	Q	Mult.: DCO(h)=0.9 *5*.
4287.4	(21$^-$)	880.3 *4*	0.6 *1*	3407.1	(19$^-$)	Q	Mult.: DCO(h)=0.8 *5*.
4426.6	(22$^+$)	1034.8 *4*	2.2 *4*	3391.8	(20$^+$)	Q	Mult.: DCO(e)=1.7 *9*.
4652.9	(22$^-$)	946.1 *4*	1.6 *3*	3706.8	(20$^-$)	Q	Mult.: DCO(f)=1.8 *8*.
4874.5	(23$^+$)	447.9 *4*	1.0 *2*	4426.6	(22$^+$)		
		1025.3 *4*	0.6 *2*	3849.2	(21$^+$)	Q	Mult.: DCO(e)=1.5 *6*.
5121.3	(23$^-$)	964.4 *4*	1.2 *2*	4156.9	(21$^-$)	Q	Mult.: DCO(f)=1.3 *5*.
5532	(24$^+$)	1105[‡] *3*		4426.6	(22$^+$)		Possibly corresponds to Eγ=1102 keV in (^{19}F,p3nγ).
5699?	(24$^-$)	1047[‡a] *3*		4652.9	(22$^-$)		
5965	(25$^+$)	1090[‡] *3*		4874.5	(23$^+$)		Possibly corresponds to Eγ=1088 keV in (^{19}F,p3nγ).
6673	(26$^+$)	1141[‡] *3*		5532	(24$^+$)		Possibly corresponds to Eγ=1139 keV in (^{19}F,p3nγ).
7105?	(27$^+$)	1140[‡a] *3*		5965	(25$^+$)		
7873?	(28$^+$)	1200[‡a] *3*		6673	(26$^+$)		

[†] From 2000Mo16, unless noted otherwise.
[‡] From 1998Sm07; no Iγ value given by authors; the Eγ are about 2 keV higher systematically than those of 2000Mo16.
[#] From 2000Mo16. Relative to I(132γ)=100.
[@] From DCO ratio (2000Mo16) as given in the comment for each γ. DCO ratio Iγ(0°)/Iγ(117°) data are obtained for the following coincidence conditions: DCO(d): from the total γ-γ asymmetric (0° by 117°) matrix; DCO(e): from the gate on 132.3 E1 transition. Note that DCO ratio of the 132.3 transition from the total γ-γ asymmetric matrix is 0.73; DCO(f): from the gate on 130.3 D(+Q) transition. Note that DCO ratio of the 130.3 transition from the total γ-γ asymmetric matrix is 0.59; DCO(g): from the gate on 95.3 D(+Q) transition DCO(h): from the gate on 579.5 Q transition. When both the gating and observing transitions are stretched and the same mult., DCO ratio, R≈1, if gating transition is stretched D transition and observing Q transition, R≈2.0. If gating stretched D transition and observing D+Q transition, R ranges between 0.5 and 2.5 depending on δ.
[&] Multiply placed with undivided intensity.
[a] Placement of transition in the level scheme is uncertain.

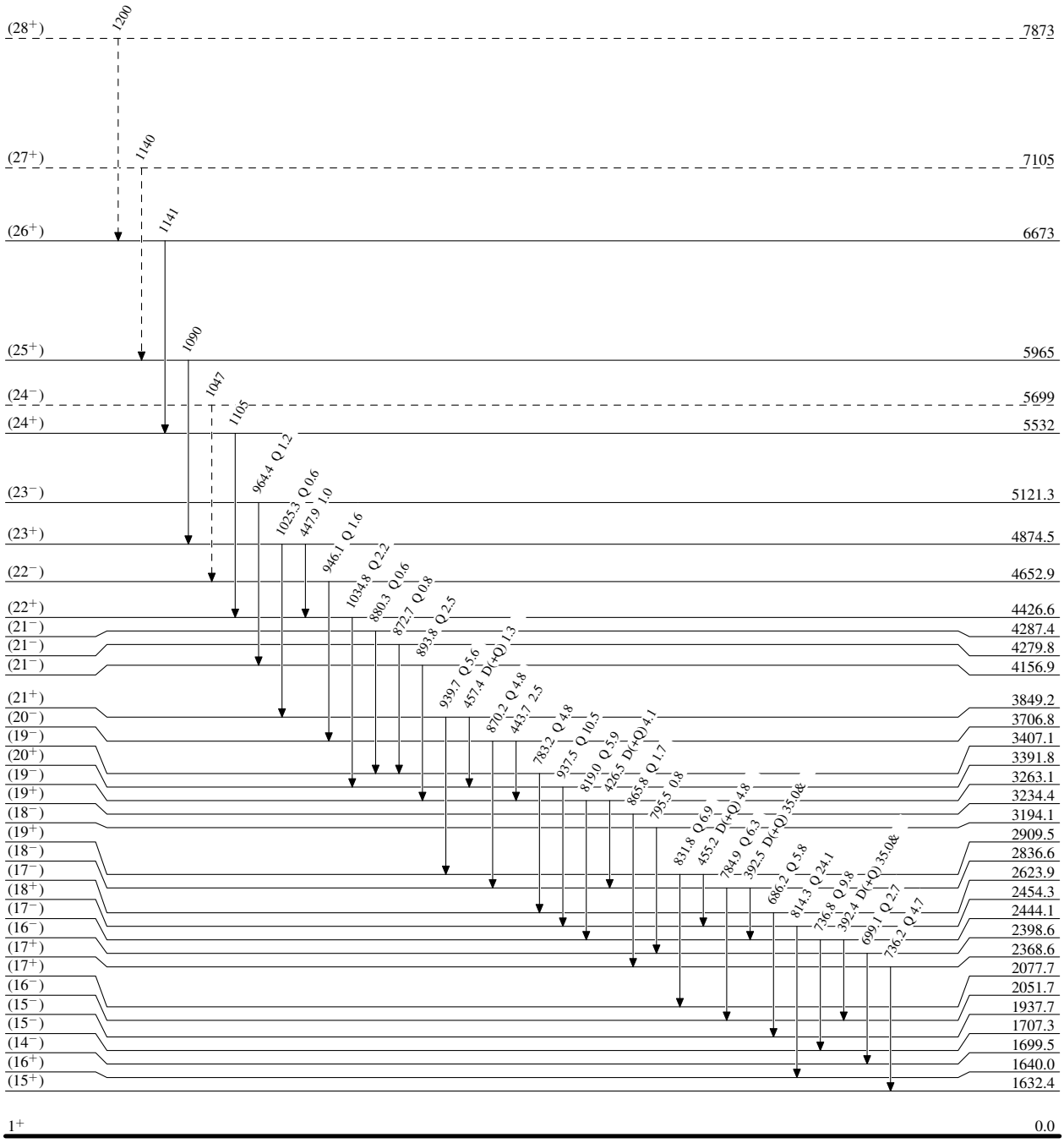
^{109}Ag(^{16}O,3nγ),^{94}Mo(^{31}P,2pnγ) **2000Mo16,1998Sm07**

Legend

Level Scheme

Intensities: relative I(γ)
& Multiply placed: undivided intensity given

γ Decay (Uncertain)

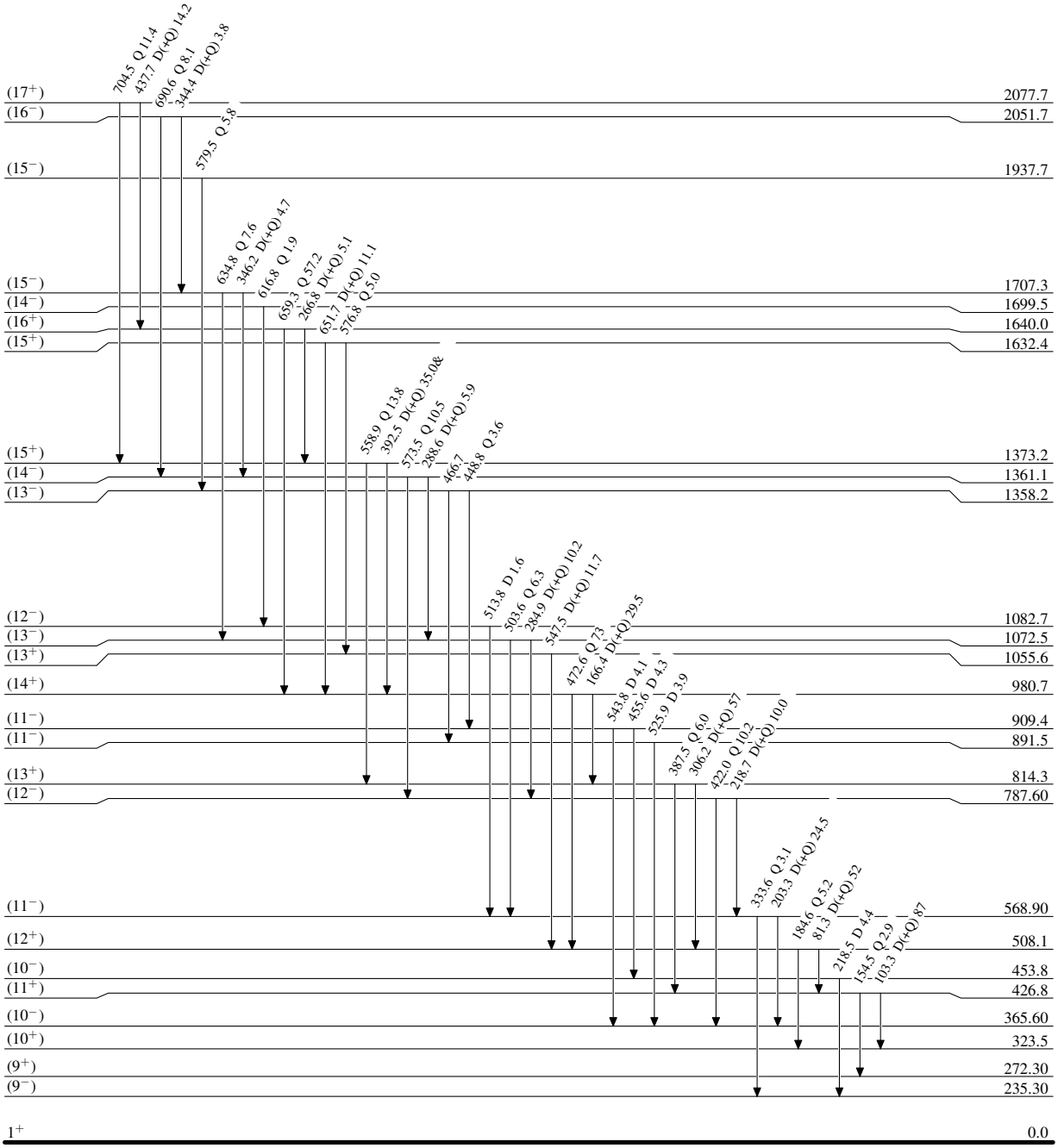


$^{122}_{55}Cs_{67}$

^{109}Ag(^{16}O,3nγ),^{94}Mo(^{31}P,2pnγ) 2000Mo16,1998Sm07

Level Scheme (continued)

Intensities: relative I(γ)
& Multiply placed: undivided intensity given

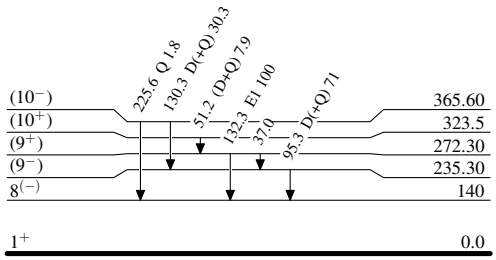


$^{122}_{55}Cs_{67}$

^{109}Ag(^{16}O,3nγ),^{94}Mo(^{31}P,2pnγ) 2000Mo16,1998Sm07

Level Scheme (continued)

Intensities: relative I(γ)
& Multiply placed: undivided intensity given



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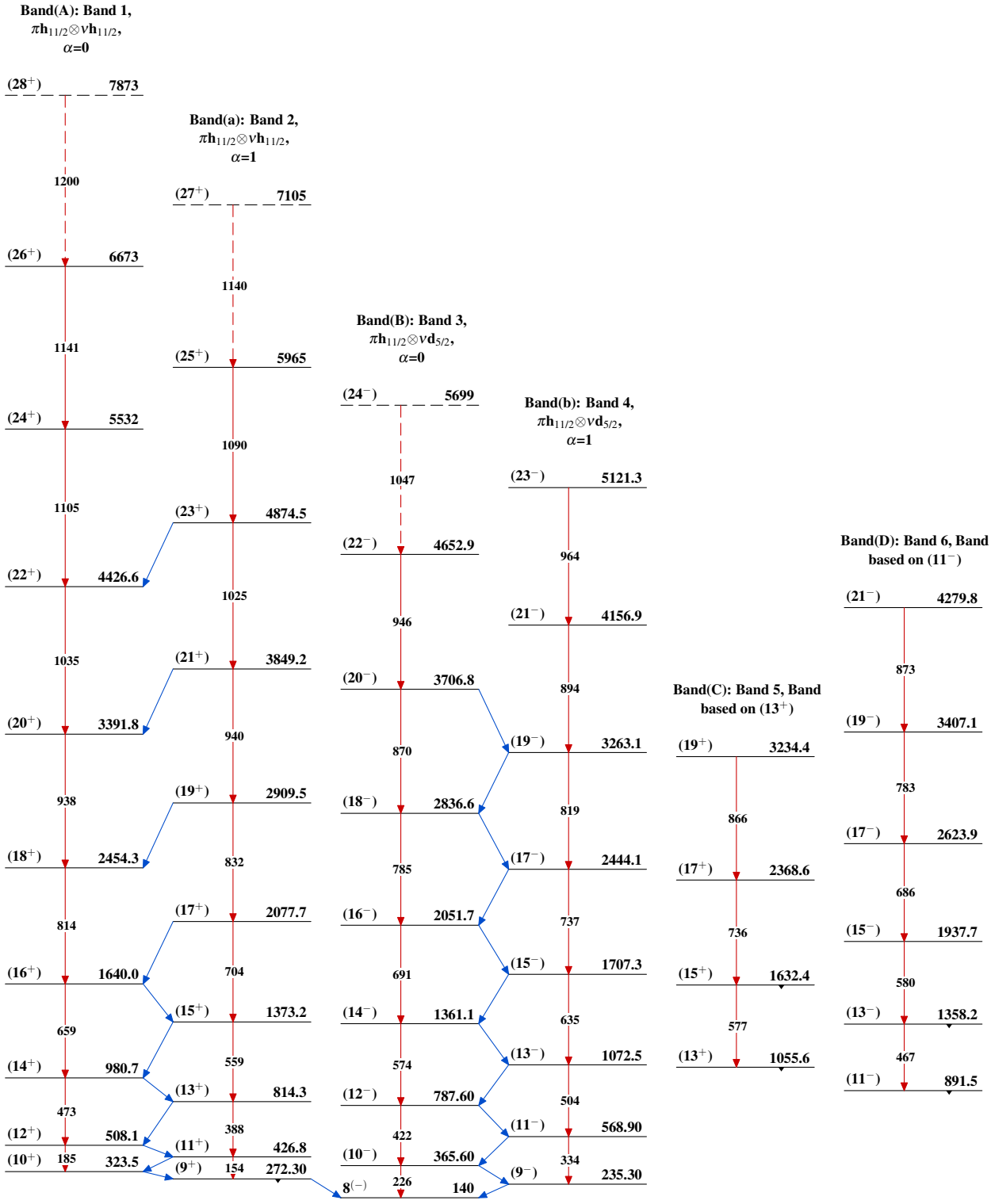
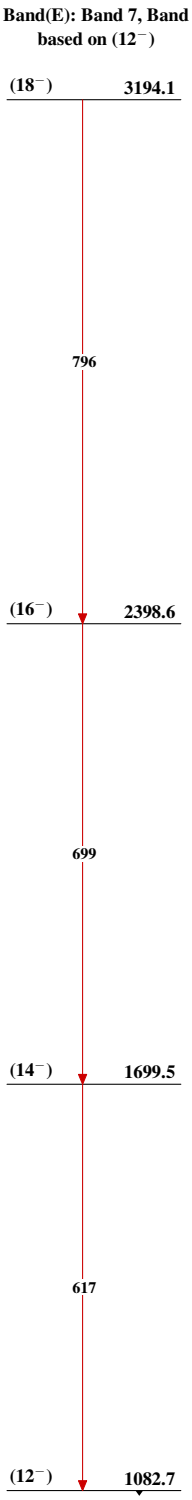


$^{122}_{55}Cs_{67}$

^{109}Ag(^{16}O,3nγ),^{94}Mo(^{31}P,2pnγ) 2000Mo16,1998Sm07 (continued)



$^{122}_{55}Cs_{67}$