^{94}Mo(^{12}C,2npγ) 1980Tr05

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	D. De Frenne	NDS 110, 2081 (2009)	1-Mar-2009

Includes ^{103}Rh(α,4nγ),^{103}Rh(^{3}He,3nγ), ^{50}Cr(^{56}Fe,3p).

1980Tr05: ^{94}Mo(^{12}C,2npγ),E(^{12}C)=44-65 MeV. Measured: Eγ, Iγ, $\gamma\gamma$- and (K x ray)γ-coin, $\gamma(\theta)$, linear polarization, ^{12}C[g(t)], $\gamma\gamma$(t). Enriched target. For Eγ>50 keV, no delayed transitions were observed. A_2- and A_4-coefficients in $\gamma(\theta)$ and linear polarization results given in the paper The polarization p is defined by the following expression: $p=[1/Q(E)][N_{ver}-N_{hor}]/[N_{ver}+N_{hor}]$ where N_{ver} and N_{hor} are respectively the horizontal and vertical number of coincidences and Q(E): the polarization sensitivity of the polarimeter. No details were given which values of p correspond to electric or magnetic transitions.

1980Lu07, ^{103}Rh(α,4nγ), (^{3}He,3nγ). E(α)=35-52 MeV, E(^{3}He)=28 MeV. Measured: Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma$(t), conversion electrons, linear pol, $\alpha\gamma$(t), deduced: ^{103}Ag levels, J^π, γ branching, δ.

1997RaZY: ^{50}Cr(^{56}Fe,3p)^{103}Ag. E(^{56}Fe)=195 MeV. Measured: Eγ, Iγ.

Other: 1977BeXV via ^{102}Pd(α,p3nγ) Eα=48 MeV, ^{94}Mo(^{12}C,p2nγ) E(^{12}C)=60 MeV.

^{103}Ag Levels

E(level)†	J$^\pi$‡	Comments
0	7/2$^+$	
27.6# *10*	9/2$^+$	
590.7# *11*	11/2$^+$	
851.0# *11*	13/2$^+$	
1490.9# *11*	15/2$^+$	
1821.8# *11*	17/2$^+$	
2066.0 *11*		
2159.0 *11*	15/2$^+$	J$^\pi$: Adopted value is (15/2$^-$).
2230.8 *11*		
2248.4 *11*		
2330.5# *11*	19/2$^+$	
2529.1 *11*		
2574.5 *13*		
2819.9# *11*	21/2$^+$	
2869.2 *11*	17/2$^-$	
2914.0 *11*		
2935.5 *11*		
3060.2 *11*		
3122.1@ *11*	19/2$^-$	J$^\pi$: π=$-$ from E1 to 17/2$^+$ level.
3222.1 *11*	(19/2$^-$)	
3304.2 *11*	(21/2)	
3321.1# *11*	23/2$^+$	
3357.4@ *11*	(21/2)$^-$	
3439.0& *11*	(21/2)$^-$	J$^\pi$: π=$-$ from E1 to 19/2$^+$ level.
3599.1& *11*	(23/2)$^-$	
3666.8@ *11*	(23/2)$^-$	
3862.0# *11*	25/2$^+$	
3936.1& *11*	(25/2)$^-$	
4029.4@ *11*	(25/2)$^-$	
4373.3& *11*	(27/2$^-$)	
4444.9@ *11*	(27/2)$^-$	
4497.4# *11*	27/2$^+$	

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$^{94}Mo(^{12}C,2np\gamma)$ 1980Tr05 (continued)

^{103}Ag Levels (continued)

E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]
4793.6[&] *11*	(29/2)⁻	5325.6[&] *15*		5494.0?[@] *12*
4961.1[@] *11*	(29/2)⁻	5387.4 *11*	(25/2)	5829.0[&] *15*
				6414.1[&] *15*

[†] The results of 1980Tr05 are more complete and have better statistics in the spectra than those of 1980Lu07, and in some cases do not agree with the results of the latter authors, and have been adopted by the evaluator.The level energies have been obtained using least-squares fit of the measured γ energies. For complete results on ^{103}Rh(α,4nγ) and ^{103}Rh(^{3}He,3nγ) see 1980Lu07.
[‡] Based on γ(θ), γ linear pol and observed band structure in ^{94}Mo(^{12}C,2npγ). Apart from parentheses for some levels the values agree with the Adopted ones.
[#] Band(A): ΔJ=1 band on Jπ=9/2⁺ level At 27 keV (1980Tr05).
[@] Band(B): ΔJ=1 band on Jπ=19/2⁻ level At 3122 keV (1980Tr05).
[&] Band(C): ΔJ=1 band on Jπ=21/2⁻ level At 3439 keV (1980Tr05).

γ(^{103}Ag)

Eγ[†]	Iγ[#]	Ei(level)	Jπi	Ef	Jπf	Mult.[@]	δ[&]	α[b]	Comments
27.6[‡] *10*		27.6	9/2⁺	0	7/2⁺				
135.4 *2*	4 *2*	3357.4	(21/2)⁻	3222.1	(19/2⁻)				
[x]140.4[a] *4*	4[a] *1*								
160.0 *2*	20 *2*	3599.1	(23/2)⁻	3439.0	(21/2)⁻				A_2=−0.255; A_4=+0.01 *5*.
164.8 *2*	4 *1*	2230.8		2066.0					A_2=−0.308; A_4=−0.07 *8*.
[x]168.4[a] *4*	2[a] *1*								
[x]206.7[a] *3*	1[a] *1*								
216.9 *2*	3 *1*	3439.0	(21/2)⁻	3222.1	(19/2⁻)				
235.4 *2*	18 *3*	3357.4	(21/2)⁻	3122.1	19/2⁻	M1+E2	+0.02 *5*	0.0407 *6*	A_2=−0.24 *6*; A_4=+0.05 *17*; Pol=−0.44 *9*.
241.7 *2*	2 *1*	3599.1	(23/2)⁻	3357.4	(21/2)⁻				
252.9 *2*	7 *1*	3122.1	19/2⁻	2869.2	17/2⁻				A_2=−0.289; A_4=+0.06 *8*.
260.2 *2*	73 *5*	851.0	13/2⁺	590.7	11/2⁺	M1+E2	+0.07 *3*		A_2=−0.13 *2*; A_4=+0.00 *2*; Pol=−0.38 *5*. δ: other: 0.10 *3* (1980Lu07).
[x]264.0[a] *2*	58[a] *5*								
280.7 *2*	2 *1*	2529.1		2248.4					
290.8 *2*	6 *1*	2819.9	21/2⁺	2529.1					A_2=−0.439; A_4=+0.06 *11*.
295[‡] *1*	2 *1*	2869.2	17/2⁻	2574.5					
309.4 *2*	18 *2*	3666.8	(23/2)⁻	3357.4	(21/2)⁻	M1+E2	+0.09 *4*	0.0201 *3*	A_2=−0.083; A_4=+0.03 *4*; Pol=−0.33 *8*.
[x]315.4[a] *3*	16[a] *4*								
317.0 *2*	7 *1*	3439.0	(21/2)⁻	3122.1	19/2⁻				A_2=−0.337; A_4=−0.01 *9*.
[x]320.9[a] *4*	5[a] *2*								
331.0 *2*	55 *8*	1821.8	17/2⁺	1490.9	15/2⁺	M1+E2	+0.05 *4*	0.01691 *24*	A_2=−0.14 *2*; A_4=−0.01 *2*; Pol=−0.42 *5*. δ: other: 0.07 *4* (1980Lu07).
337.0 *2*	30 *2*	3936.1	(25/2)⁻	3599.1	(23/2)⁻	M1+E2	+0.05 *4*	0.01617 *23*	A_2=−0.143; A_4=−0.01 *3*; Pol=−0.41 *6*.
[x]340.0[a] *4*	22[a] *5*								
344[‡] *1*	2 *1*	2574.5		2230.8					
346[‡] *1*	2 *1*	3666.8	(23/2)⁻	3321.1	23/2⁺				

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^{94}Mo(^{12}C,2npγ) 1980Tr05 (continued)

γ(^{103}Ag) (continued)

E_γ [†]	I_γ [#]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [@]	δ [&]	Comments
362.5[‡] *10*	14 *2*	3666.8	(23/2)$^-$	3304.2	(21/2)			A_2=−0.21*6*; A_4=+0.10 *8*; Pol=−0.39 *10*. Composite line. M1+E2 is given with δ=+0.03 *6* in (^{12}C,p2nγ).
362.5 *2*	14 *2*	4029.4	(25/2)$^-$	3666.8	(23/2)$^-$			A_2=−0.21*6*; A_4=+0.10 *8*; Pol=−0.39 *10*. Composite line. M1+E2 given with δ=+0.03 *6* in (^{12}C,p2nγ).
[x]368.1[a] *3*	12[a] *4*							
[x]382.0[a] *2*	9[a] *3*							
[x]400.7[a] *2*	12[a] *4*							
415.5 *2*	11 *2*	4444.9	(27/2)$^-$	4029.4	(25/2)$^-$	M1+E2	+0.11 *5*	A_2=−0.04*5*; A_4=+0.02 *7*; Pol=−0.40 *12*.
420.2 *2*	18 *2*	4793.6	(29/2)$^-$	4373.3	(27/2$^-$)	M1+E2	+0.05 *4*	A_2=−0.16*4*; A_4=+0.00 *6*; Pol=−0.46 *10*.
[x]425.9[a] *4*	19[a] *5*							
437.2 *2*	17 *3*	4373.3	(27/2$^-$)	3936.1	(25/2)$^-$	M1+E2	+0.03 *4*	A_2=−0.19*5*; A_4=−0.03 *6*; Pol=−0.52 *8*.
[x]442.6[a] *2*	25[a] *4*							
489.4 *2*	16 *2*	2819.9	21/2$^+$	2330.5	19/2$^+$	M1+E2	+0.05 *4*	A_2=−0.14*4*; A_4=+0.02 *17*; Pol=−0.36 *9*. δ: other: 0.13 *5* (1980Lu07).
[x]494.4[a] *4*	27[a] *6*							
501.1 *2*	12 *4*	3321.1	23/2$^+$	2819.9	21/2$^+$	M1+E2	+0.03 *7*	A_2=−0.18*6*; A_4=+0.08 *8*.
[x]502.7[a] *4*	66[a] *8*							
503.4 *2*	7 *3*	5829.0		5325.6				A_2=−0.504*13*; A_4=+0.17 *16*.
508.6 *2*	34 *6*	2330.5	19/2$^+$	1821.8	17/2$^+$	M1+E2	+0.03 *6*	A_2=−0.19*5*; A_4=+0.08 *5*.
516.2 *2*	8 *2*	4961.1	(29/2)$^-$	4444.9	(27/2)$^-$			A_2=−0.26*13*; A_4=+0.21 *15*.
[x]529.4[a] *2*	52[a] *7*							
532 *1*	11 *3*	5325.6		4793.6	(29/2)$^-$			
533.0[c] *2*		5494.0?		4961.1	(29/2)$^-$			
[x]536.6[a] *3*	19[a] *5*							
540.8[‡] *10*	19 *2*	3862.0	25/2$^+$	3321.1	23/2$^+$			A_2=−0.17*4*; A_4=+0.10 *6*.
[x]548.8[a] *3*	11[a] *4*							
563.2 *2*	100	590.7	11/2$^+$	27.6	9/2$^+$	M1+E2	+0.32 *4*	A_2=−0.25 *13*; A_4=+0.35 *16*; Pol=−0.57 *7*. δ: other: 0.45 *3* (1980Lu07).
[x]570.0[a] *3*	51[a] *7*							
[x]576.5[a] *3*	17[a] *5*							
585.1 *2*	4.5 *20*	6414.1		5829.0				A_2=−0.25*13*; A_4=+0.35 *16*.
[x]591.4[a] *3*	14[a] *5*							E_γ: unresolved doublet.
605.0 *2*	11 *2*	2935.5		2330.5	19/2$^+$			A_2=−0.20*10*; A_4=−0.01 *17*.
635.4 *2*	11 *2*	4497.4	27/2$^+$	3862.0	25/2$^+$	M1+E2	+0.25 *9*	A_2=0.20*8*; A_4=−0.06 *10*; Pol=−0.38 *24*.
639.9 *2*	81 *4*	1490.9	15/2$^+$	851.0	13/2$^+$	M1+E2	+0.22 *4*	A_2=0.11*2*; A_4=−0.03 *3*; Pol=−0.53 *7*.
[x]649.0[a] *3*	65[a] *8*							
[x]656.2[a] *4*	20[a] *5*							
664[‡] *1*	7.5 *20*	3599.1	(23/2)$^-$	2935.5				
[x]698.2 *2*	2 *1*							
707.2 *2*	13 *4*	2529.1		1821.8	17/2$^+$	(M1+E2)		Mult.: from 1980Lu07, based on conversion electron measurements. No δ given.
[x]717.5[a] *4*	15[a] *5*							
725[‡] *1*		4029.4	(25/2)$^-$	3304.2	(21/2)			
[x]735.8[a] *3*	12[a] *4*							
[x]743.0[a] *5*	9[a] *4*							
758[‡] *1*		2248.4		1490.9	15/2$^+$			
[x]772.7[a] *3*	10[a] *4*							
779[‡] *1*	15 *3*	3599.1	(23/2)$^-$	2819.9	21/2$^+$	(E1)		A_2=−0.02*5*; A_4=−0.04 *6*; Pol=0.49 *13*.

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^{94}Mo(^{12}C,2npγ) 1980Tr05 (continued)

γ(^{103}Ag) (continued)

E$_\gamma$[†]	I$_\gamma$[#]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.[@]	δ[&]	Comments
								Composite line. E1,E2 is given as multipolarity by 1980Tr05. If 3599 level is band member of ΔJ=1 band on 21/2$^-$ 3439 keV level, E2 is excluded.
779 *1*	15 *3*	4444.9	(27/2)$^-$	3666.8	(23/2)$^-$			A$_2$=−0.02*5*; A$_4$=−0.04 *17*; Pol=0.49 *13*. Composite line. E1,E2 given as multipolarity in (^{12}C,p2nγ).
^{x}789.1[a] *3*	10[a] *3*							
^{x}804.7[a] *3*	23[a] *4*							
^{x}817.0[a] *4*	24[a] *6*							
^{x}823.3[a] *2*	100[a]							
823.3 *2*	120 *18*	851.0	13/2$^+$	27.6	9/2$^+$	E2		A$_2$=0.29 *1*; A$_4$=−0.09 *1*; Pol=0.49 *7*.
^{x}835.6[a] *2*	65[a] *7*							
839.6 *2*	30 *3*	2330.5	19/2$^+$	1490.9	15/2$^+$	E2		A$_2$=0.32*3*; A$_4$=−0.10 *3*; Pol=0.42 *10*.
^{x}850.9[a] *3*	7[a] *4*							
857.6 *2*		4793.6	(29/2)$^-$	3936.1	(25/2)$^-$			
^{x}877.0[a] *4*	7[a] *5*							
^{x}880.8[a] *4*	17[a] *7*							
^{x}892.9[a] *3*	7[a] *4*							
900.2 *2*	17 *2*	1490.9	15/2$^+$	590.7	11/2$^+$	E2		A$_2$=0.26 *3*; A$_4$=−0.08 *4*; Pol=0.35 *13*.
910[‡] *1*	4 *1*	3439.0	(21/2)$^-$	2529.1				
^{x}923.8[a] *2*	9[a] *3*							
^{x}949.5[a] *2*	7[a] *3*							
970.7 *2*	85 *5*	1821.8	17/2$^+$	851.0	13/2$^+$	E2		A$_2$=0.33 *1*; A$_4$=−0.10 *1*; Pol=−0.51 *8*.
973.7 *2*	12 *3*	3304.2	(21/2)	2330.5	19/2$^+$			
^{x}984.7[a] *3*	28[a] *6*							
990.7 *2*	23 *2*	3321.1	23/2$^+$	2330.5	19/2$^+$	E2		A$_2$=0.32 *5*; A$_4$=−0.18 *6*; Pol=0.25 *10*.
998.2 *2*	24 *2*	2819.9	21/2$^+$	1821.8	17/2$^+$	E2		A$_2$=0.24*3*; A$_4$=−0.05 *5*; Pol=0.35 *11*.
^{x}1009.2[a]	17[a] *5*							E$_\gamma$: unresolved doublet.
^{x}1023.0[a] *2*	7[a] *3*							
^{x}1035.0[a]	12[a] *4*							E$_\gamma$: unresolved doublet.
^{x}1042.1[a] *3*	11[a] *4*							
1042.1 *2*	6 *1*	3862.0	25/2$^+$	2819.9	21/2$^+$			A$_2$=0.13*12*; A$_4$=−0.08 *19*.
^{x}1047.5[a] *3*	6[a] *3*							
^{x}1104.1[a] *5*	9[a] *3*							
1108.4 *2*	6 *1*	3439.0	(21/2)$^-$	2330.5	19/2$^+$	E1		A$_2$=−0.18 *8*; A$_4$=+0.08 *10*; Pol=0.33 *20*.
^{x}1111.1[a] *3*	17[a] *3*							
^{x}1123.7[a] *4*	8[a] *3*							
^{x}1132.1[a] *4*	10[a] *4*							
^{x}1152.7[a] *3*	3[a] *1*							
^{x}1165.9[a] *2*	6[a] *2*							
1176.3 *2*	4 *1*	4497.4	27/2$^+$	3321.1	23/2$^+$			
^{x}1212.0[a] *4*	3[a] *2*							
1215.0 *2*	5 *1*	2066.0		851.0	13/2$^+$			A$_2$=0.21*12*; A$_4$=+0.03 *17*.
^{x}1227.1[a]	5[a] *2*							E$_\gamma$: unresolved doublet.
^{x}1242.5[a] *2*	8[a] *3*							
^{x}1270.5[a] *3*	6[a] *2*							
^{x}1287.5[a] *3*	17[a] *4*							
1300.3 *2*	15 *2*	3122.1	19/2$^-$	1821.8	17/2$^+$	E1		A$_2$=−0.33*3*; A$_4$=+0.0 *4*; Pol=0.29 *20*.
1308.0 *2*	7 *1*	2159.0	15/2$^+$	851.0	13/2$^+$	M1+E2	0.00 *5*	A$_2$=−0.24*6*; A$_4$=+0.02 *17*; Pol=0.29 *1*.
^{x}1319.5[a]	15[a] *5*							E$_\gamma$: unresolved doublet.
^{x}1334.2[a] *2*	5[a] *2*							

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^{94}Mo(^{12}C,2npγ) 1980Tr05 (continued)

γ(^{103}Ag) (continued)

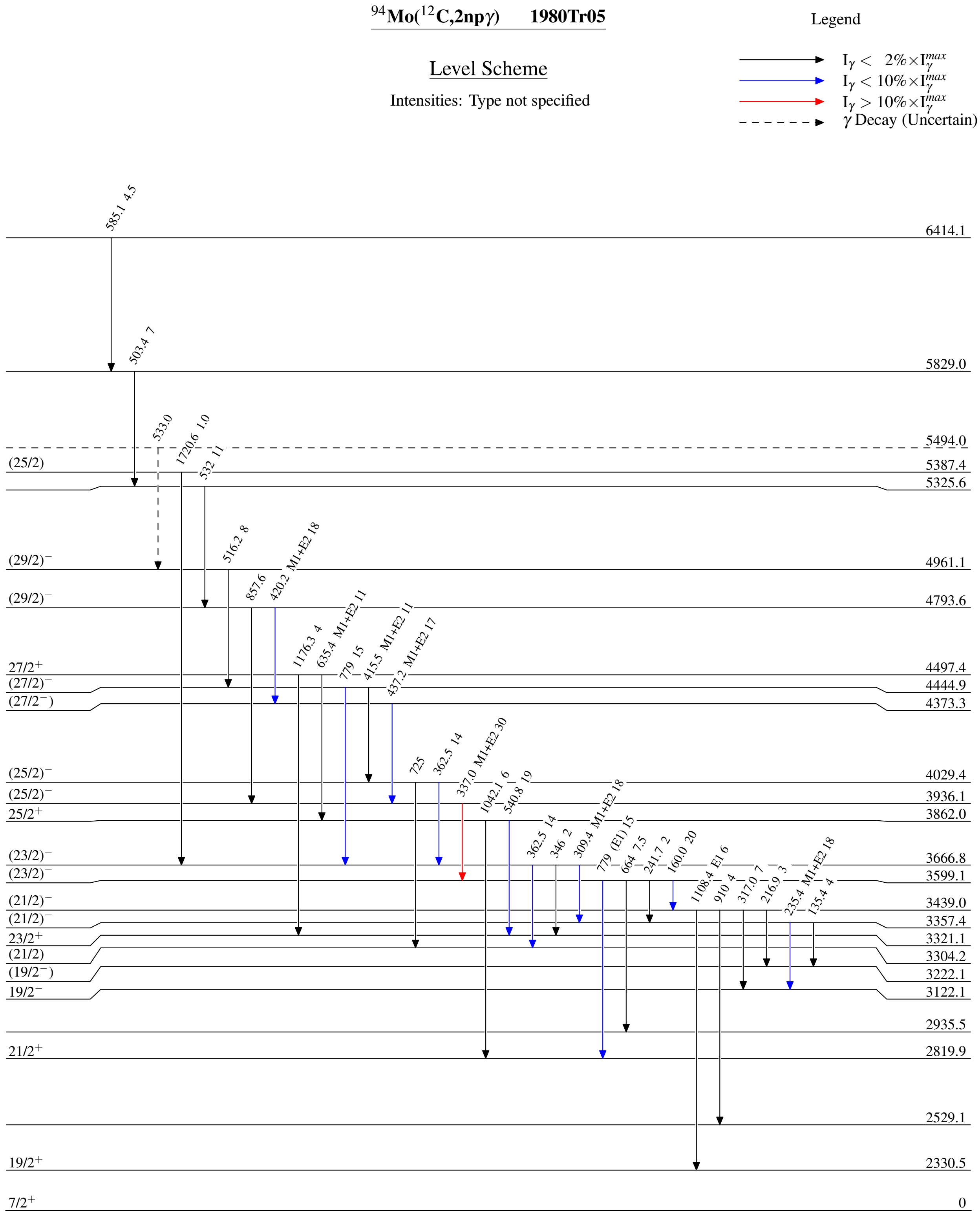
E_γ[†]	I_γ[#]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	Comments
[x]1369.0[a] *4*	3[a] *1*						
1378.4 *2*	5 *1*	2869.2	17/2$^-$	1490.9	15/2$^+$	E1	A_2=−0.46*13*; A_4=+0.12 *17*; Pol=0.33 *20*.
[x]1397.0[a] *5*	9[a] *3*						
1400.2[‡] *10*	5 *1*	3222.1	(19/2$^-$)	1821.8	17/2$^+$	(E1)	A_2=−0.41*7*; A_4=+0.10 *10*; Pol=0.12 *22*.
[x]1404.2[a] *5*	12[a] *4*						
1423.1 *2*	1.0 *5*	2914.0		1490.9	15/2$^+$		
[x]1442.7[a] *4*	9[a] *3*						
[x]1487.7[a]	10[a] *4*						E_γ: unresolved doublet.
[x]1505.3[a] *3*	6[a] *3*						
[x]1562.3[a] *4*	5[a] *2*						
1569.3 *2*	2.5 *10*	3060.2		1490.9	15/2$^+$		
[x]1595.2[a]	14[a] *5*						E_γ: unresolved doublet.
1720.6 *2*	1.0 *5*	5387.4	(25/2)	3666.8	(23/2)$^-$		A_2=−0.30*19*; A_4=−0.01 *17*.
[x]1725.5[a] *5*	5[a] *3*						

[†] From 1980Tr05.
[‡] Composite line.
[#] Given for E(^{12}C)=54 MeV. The placements of the γ transitions are those proposed in (^{12}C,p2nγ). For Iγ in (α,4nγ) see 1980Lu07.
[@] From $\gamma(\theta)$ and linear polarization ^{94}Mo(^{12}C,2npγ), most of them confirmed by conversion electron measurements in ^{103}Rh(α,4nγ), (^{3}He,3nγ).
[&] Taken from ^{94}Mo(^{12}C,2npγ).
[a] Unassigned γ's from 1997RaZY.
[b] 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.
[c] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

^{94}Mo(^{12}C,2npγ) 1980Tr05

Level Scheme

Intensities: Type not specified



$^{103}_{47}Ag_{56}$

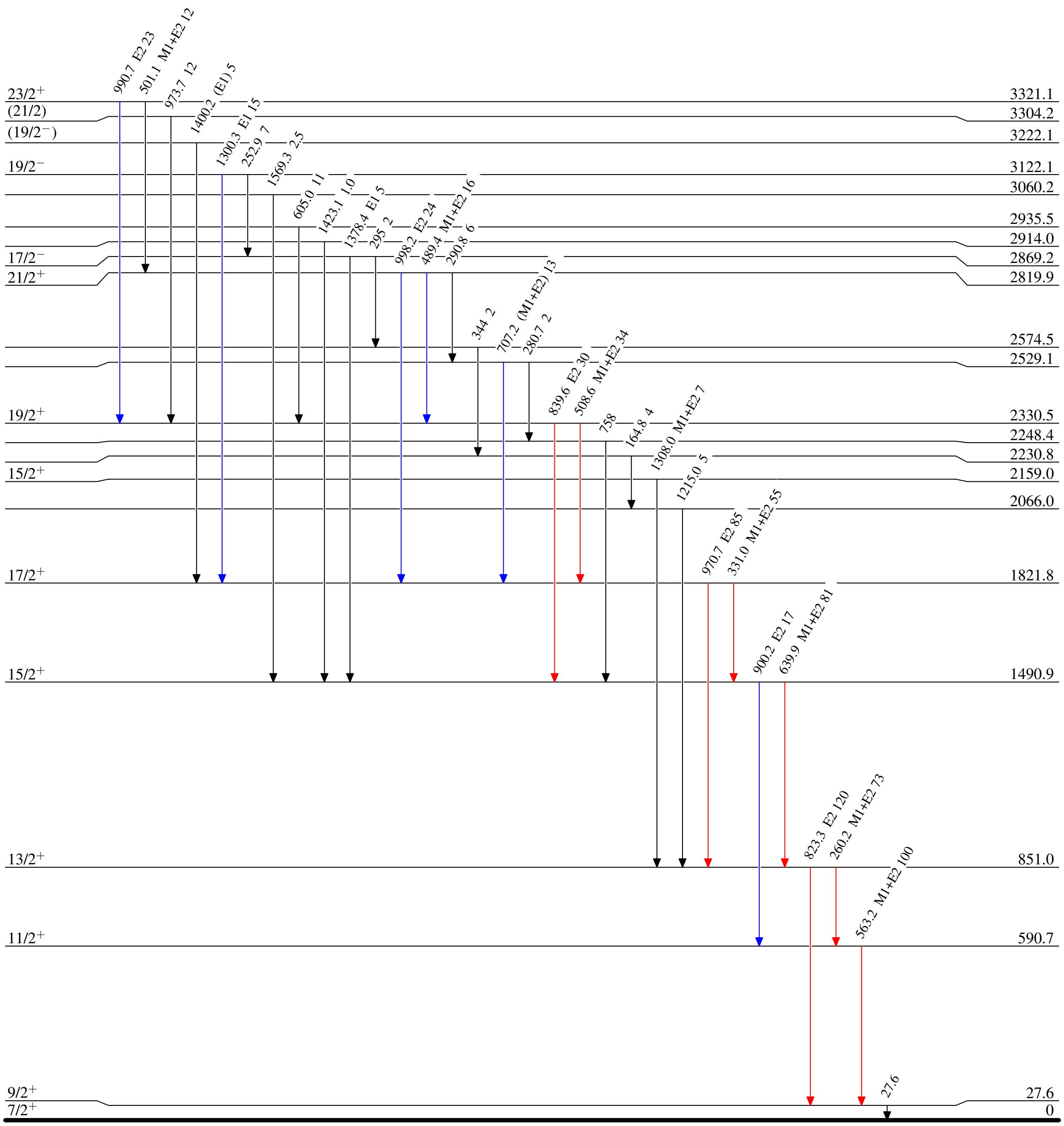
^{94}Mo(^{12}C,2npγ) 1980Tr05

Level Scheme (continued)

Intensities: Type not specified

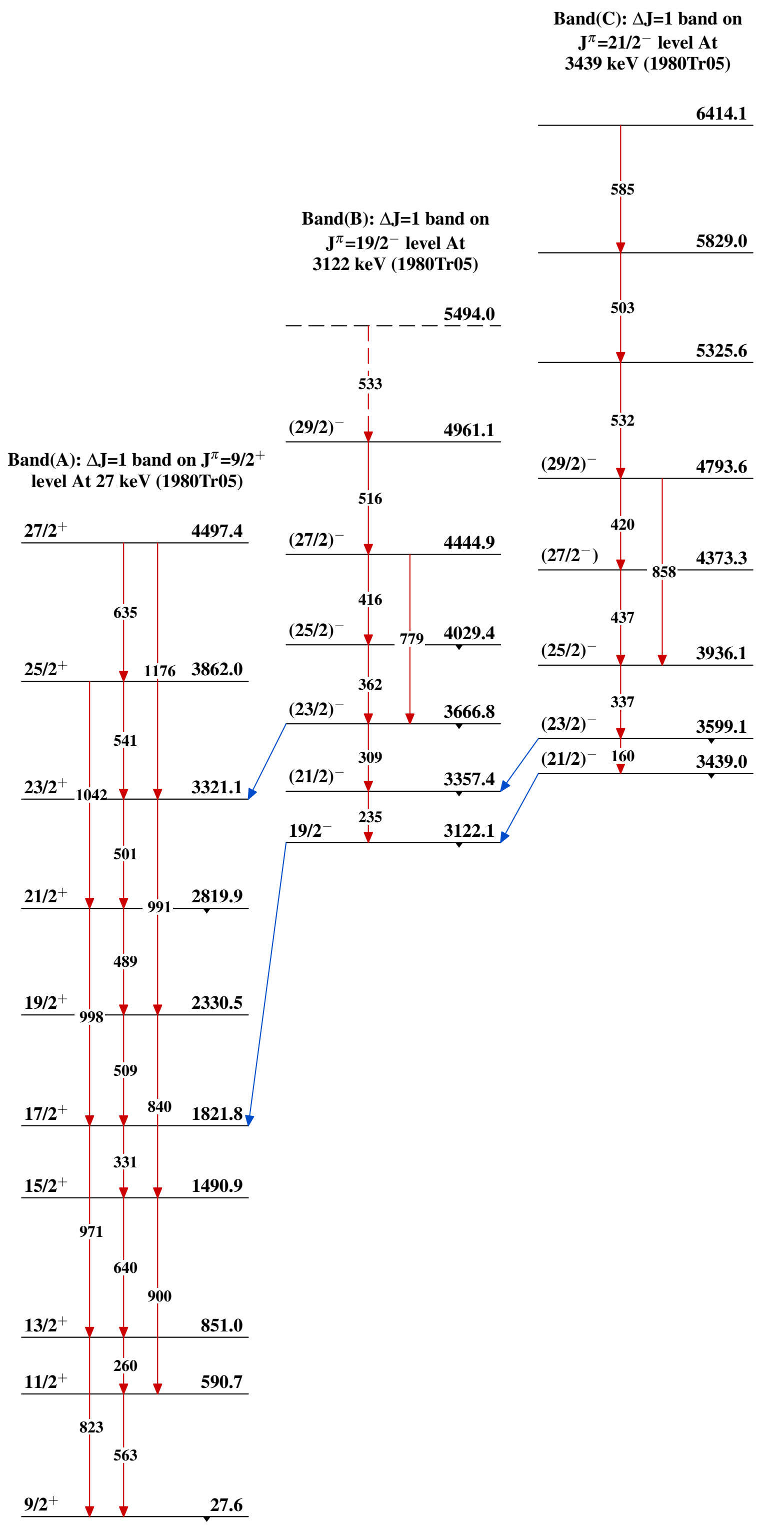
Legend

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



$^{103}_{47}Ag_{56}$

$^{94}Mo(^{12}C,2np\gamma)$ 1980Tr05



$^{103}_{47}Ag_{56}$