^{141}Pr(^{16}O,6nγ) 1981Gi12

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 110, 1 (2009)	20-Nov-2008

1981Gi12: ^{141}Pr(^{16}O,6n) E=101-131 MeV and ^{144}Sm(^{12}C,p4n) E=76-110 MeV. Measured γ, $\gamma\gamma$, $\gamma(\theta)$, γ(t), $\gamma\gamma$(t), multiplicity and excitation functions. Linear polarizations of strong γ rays were measured using ^{144}Sm(^{12}C,p4nγ) E=98 MeV.
The level scheme and γ-ray placements are mainly from 1994Zh08. In many cases, noted under comments, these placements differ from those given by 1981Gi12.
Additional information 1.

^{151}Ho Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0.0[#]	(11/2$^-$)		
789.4[#] *1*	(15/2$^-$)		
1386.8[#] *2*	(19/2$^-$)		
1684.0[#] *2*	(23/2$^-$)		
1791.0[#] *2*	(21/2$^-$)		
2098.2 *2*	(25/2$^-$)		
2226.9 *2*	(27/2$^-$)		
2615.1 *2*	(27/2)		
2851.0?[@] *3*	(27/2$^-$)		
2879.9 *3*	(29/2)		
3143.9 *4*	(29/2)		
3155.0 *3*	(31/2)		
3313.9 *5*	(33/2)		
3522.4 *3*	(33/2)		
3623.7[@] *2*	(31/2$^-$)		
4109.5[@] *2*	(35/2$^-$)		
4355.5[@] *3*	(39/2$^-$)		
4811.0 *3*	(43/2$^-$)	≈1 ns	$T_{1/2}$: from 1994Zh08.
5292.8 *3*	(41/2)		
5577.4? *4*	(43/2)		
5642.1 *4*	(45/2)		
5835.2 *3*	(45/2)		
5874.9 *5*	(47/2)		
6183.5 *5*	(49/2)		
6224.8 *6*			
6533.8 *6*			
6658.9 *6*			
7070.6 *6*			
7098.4 *7*			
7192.6 *6*			
8340.1 *8*	(≥57/2)	14 ns *30*	J$^\pi$: from multiplicity=17±2 and assuming that an average yrast transition removes 1.65±0.16 units of angular momentum. J(isomer)=J(g.s.)+1.65(multiplicity)=(67/2)±5. $T_{1/2}$: γ(t) (1981Gi12).
9052.7 *8*			Level from 1994Zh08.
9530.7? *9*			

[†] From least-squares fit to Eγ's. γ-ray energy uncertainty of 0.1 keV assigned for strong γ rays and 0.3 keV for others.
[‡] From $\gamma(\theta)$. See also 'Adopted Levels'.
[#] Band(A): $\pi h^3_{11/2}\otimes\nu f^2_{7/2}$. multiplet of states with seniority=1.
[@] Band(B): $\pi h^3_{11/2}\otimes\nu f^2_{7/2}$. multiplet of states with seniority=3.

^{141}Pr(^{16}O,6nγ) 1981Gi12 (continued)

$\gamma(^{151}Ho)$

E_γ[#]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[&]	Comments
128.8 *1*	31 *2*	2226.9	(27/2$^-$)	2098.2	(25/2$^-$)	M1(+E2)	1.19 *8*	α(K)=0.82 *25*; α(L)=0.29 *14*; α(M)=0.07 *4*; α(N+..)=0.017 *9* α(N)=0.015 *8*; α(O)=0.0020 *8*; α(P)=4.5×10^{-5} *21* A$_2$=−0.46 *12*. α(exp)=1.21 *8*. δ(E2/M1)=0.5 *3* or 1.8 *+16−6*.
232.8 *1*	12 *2*	5874.9	(47/2)	5642.1	(45/2)			A$_2$=−0.60 *22*. γ placed from a 6184 level by 1981Gi12.
246.0 *1*	66 *4*	4355.5	(39/2$^-$)	4109.5	(35/2$^-$)	E2	0.1241	α(K)=0.0875 *13*; α(L)=0.0282 *4*; α(M)=0.00661 *10*; α(N+..)=0.001700 *24* α(N)=0.001504 *22*; α(O)=0.000192 *3*; α(P)=4.35×10^{-6} *7* A$_2$=+0.16 *14*. Polarization data: N(1)/N(2)=1.40 *28* give $\Delta\pi$=no.
257.7	16 *3*	5835.2	(45/2)	5577.4?	(43/2)			A$_2$=−0.01 *14*. γ placed from a 4613 level by 1981Gi12.
264.6	13	2879.9	(29/2)	2615.1	(27/2)			γ placed from a 4109 level by 1981Gi12.
275.0	10	3155.0	(31/2)	2879.9	(29/2)			γ placed from a 3844 level by 1981Gi12.
284.5	8	5577.4?	(43/2)	5292.8	(41/2)			γ placed from a 4898 level by 1981Gi12.
297.2 *1*	79 *5*	1684.0	(23/2$^-$)	1386.8	(19/2$^-$)			A$_2$=+0.11 *5*.
307.2 *1*	24 *4*	2098.2	(25/2$^-$)	1791.0	(21/2$^-$)			A$_2$=−0.35 *13*.
308.7 *1*	32 *5*	6183.5	(49/2)	5874.9	(47/2)	(M1+E2)	0.09 *3*	α(K)=0.07 *3*; α(L)=0.0130 *10*; α(M)=0.00293 *15*; α(N+..)=0.00077 *5* α(N)=0.00068 *4*; α(O)=9.4×10^{-5} *11*; α(P)=4.1×10^{-6} *18* A$_2$=−0.44 *13*. δ=−0.45 *25* or −1.9 *+6−20*. γ placed from a 5120 level by 1981Gi12.
309[a]		6533.8		6224.8				γ placed from a 5207 level by 1981Gi12.
350[@]		6224.8		5874.9	(47/2)			
367.3 *1*	21 *3*	3522.4	(33/2)	3155.0	(31/2)			A$_2$=−0.28 *6*. γ placed from a 3052 level by 1981Gi12.
404.4 *1*	10 *3*	1791.0	(21/2$^-$)	1386.8	(19/2$^-$)			
414.1 *1*	57 *4*	2098.2	(25/2$^-$)	1684.0	(23/2$^-$)	M1+E2	0.039 *14*	α(K)=0.032 *12*; α(L)=0.0054 *10*; α(M)=0.00120 *20*; α(N+..)=0.00032 *6* α(N)=0.00028 *5*; α(O)=3.9×10^{-5} *9*; α(P)=1.9×10^{-6} *8* A$_2$=−0.32 *3*. Polarization data: N(1)/N(2)=0.85 *20* gives $\Delta\pi$=no. δ=−0.19 *2* or −3.4 *5*.
434[@]		3313.9	(33/2)	2879.9	(29/2)			
434[@]		6658.9		6224.8				
455.5 *1*	70 *5*	4811.0	(43/2$^-$)	4355.5	(39/2$^-$)	E2	0.0202	α(K)=0.01599 *23*; α(L)=0.00325 *5*; α(M)=0.000740 *11*; α(N+..)=0.000194 *3* α(N)=0.0001699 *24*; α(O)=2.30×10^{-5} *4*; α(P)=8.81×10^{-7} *13* A$_2$=+0.17 *6*. Polarization data: N(1)/N(2)=1.13 *18* data give $\Delta\pi$=no.
478[@]		9530.7?		9052.7				
485.8 *1*	47 *5*	4109.5	(35/2$^-$)	3623.7	(31/2$^-$)			A$_2$=+0.18 *4*.
516.9 *1*	17 *2*	2615.1	(27/2)	2098.2	(25/2$^-$)			A$_2$=+0.11 *17*. γ placed from a 3569 level by 1981Gi12.
539.9	6	3155.0	(31/2)	2615.1	(27/2)			γ placed from a 4109 level by 1981Gi12.
543.0	8	2226.9	(27/2$^-$)	1684.0	(23/2$^-$)			γ placed from a 4898 level by 1981Gi12.
564.6		7098.4		6533.8				γ placed from a 6617 level by 1981Gi12.
587.1 *1*	38 *4*	4109.5	(35/2$^-$)	3522.4	(33/2)			A$_2$=+0.23 *11*. γ placed from a 2685 level by 1981Gi12.

Continued on next page (footnotes at end of table)

^{141}Pr(^{16}O,6nγ) 1981Gi12 (continued)

γ(^{151}Ho) (continued)

E_γ[#]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[&]	Comments
597.4 *1*	102 *5*	1386.8	(19/2$^-$)	789.4	(15/2$^-$)			A_2=+0.15 *3*.
624.0	7	2851.0?	(27/2$^-$)	2226.9	(27/2$^-$)			
712.6		9052.7		8340.1	(≥57/2)			E_γ: from 1994Zh08.
772.7	8	3623.7	(31/2$^-$)	2851.0?	(27/2$^-$)			
789.4 *1*	100 *5*	789.4	(15/2$^-$)	0.0	(11/2$^-$)			A_2=+0.11 *3*.
[x]792								γ placed from a 3844 level by 1981Gi12.
831.1	10 *2*	5642.1	(45/2)	4811.0	(43/2$^-$)			A_2=−0.63 *30*.
								γ placed from a 5951 level by 1981Gi12.
887[@]		7070.6		6183.5	(49/2)			
917.0	10 *2*	3143.9	(29/2)	2226.9	(27/2$^-$)			A_2=+0.26 *5*.
								γ placed from a 5728 level by 1981Gi12.
[x]919.4	5							γ placed from a 3972 level by 1981Gi12.
937.3 *1*	12 *3*	5292.8	(41/2)	4355.5	(39/2$^-$)			A_2=−0.03 *14*.
								γ placed from a 6144 level by 1981Gi12.
1009[@]		7192.6		6183.5	(49/2)			
1024.2 *1*	26 *4*	5835.2	(45/2)	4811.0	(43/2$^-$)			A_2=−0.36 *18*.
								γ placed from a 6144 level by 1981Gi12.
1241.6	9 *1*	8340.1	(≥57/2)	7098.4				A_2=−0.11 *19*.
								γ placed from a 6053 level by 1981Gi12.
1396.8 *1*	56 *8*	3623.7	(31/2$^-$)	2226.9	(27/2$^-$)	E2	1.69×10^{-3}	α(K)=0.001391 *20*; α(L)=0.000198 *3*; α(M)=4.34×10^{-5} *6*; α(N+..)=5.29×10^{-5} *8*
								α(N)=1.006×10^{-5} *14*; α(O)=1.455×10^{-6} *21*; α(P)=7.99×10^{-8} *12*; α(IPF)=4.13×10^{-5} *6*
								A_2=+0.20 *22*. Polarization data: N(1)/N(2)=1.13 *20* give $\Delta\pi$=no.

[†] From ^{141}Pr+^{16}O reaction at E=131 MeV.
[‡] From $\gamma(\theta)$ and linear polarization. Polarization data are quoted as N(1)/N(2), where N(1) and N(2) are intensities in the perpendicular and parallel planes, respectively, to the reaction plane.
[#] For strong γ rays 1981Gi12 quote uncertainty of<0.1 keV.
[@] Seen in $\gamma\gamma$ but not placed in the level scheme.
[&] 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.
[a] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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Level Scheme

Intensities: Relative I_γ

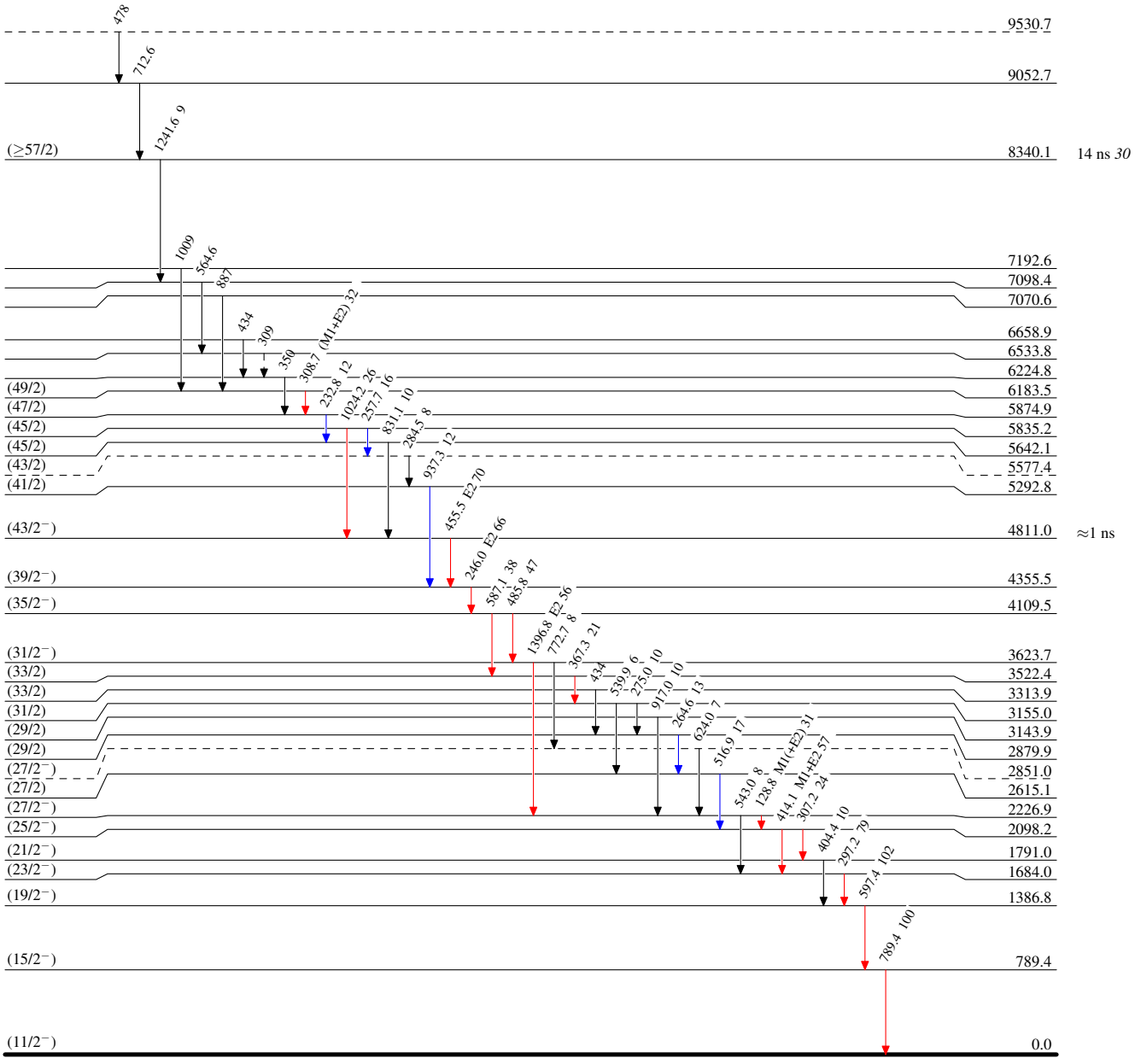
Legend

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

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

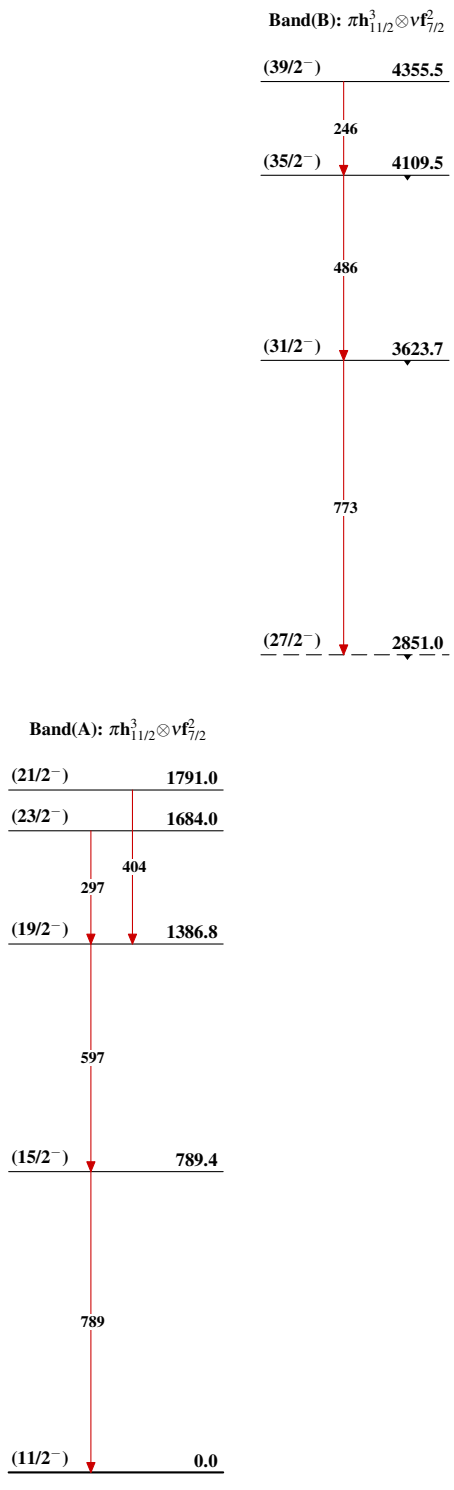
$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



$^{151}_{67}Ho_{84}$

$^{141}Pr(^{16}O,6n\gamma)$ 1981Gi12



$^{151}_{67}Ho_{84}$