^{16}O(^{16}O,pnγ) 2007Ra20,1990En08

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia, A. Chakraborty	NDS 197,1 (2024)	31-May-2024

2007Ra20: Target: Thin 500 μg/cm^2 ^{24}Mg target with thick Ni backing; a thin oxide layer was present on the surface of the target; Projectile: ^{16}O, E=40 MeV; Detector setup: INGA (Indian National Gamma Array) comprised of 8 Compton suppressed Clover detectors were used; Measured: Eγ, Iγ, $\gamma\gamma$ coin, branching ratio, γ-ray polarization, DCO, deduced level scheme. Numerical data related to γ-ray polarization measurements (pol values) were obtained through a private communication (via e-mail on Sept 25, 2007) between XUNDL compilers (S. Geraedts and B. Singh) and Dr. M. Saha Sarkar (corresponding author of 2007Ra20). 1990En08 compiled data from ^{16}O(^{16}O,pnγ) studies based on a private communication with Dr. Arciszewski, Utrecht University.

Others: 1980La12,1974Sp06.

^{30}P Levels

E(level)[†]	J$^\pi$[@]	T$_{1/2}$[&]	Comments
0	1$^+$		
709.1 *5*	1$^+$	33 ps *2*	
1455.1 *5*	2$^+$		
1974.1 *5*	3$^+$	1.46 ps *13*	
2539.2 *6*	3$^+$		
2840.2[‡] *6*	3$^+$		
4144.3[‡] *6*	2$^-$		
4183.3[‡] *6*	2$^+$		
4232.3 *6*	4$^-$		
4344.2 *12*	5$^+$		
4421[#] *5*			
4468[#] *5*			
4501[#] *5*			
4625[#] *5*			
4735[#] *5*			
4926.3 *7*	5$^-$		
4951[#] *5*			
5026[#] *5*			
5204[#] *5*			
5232.3 *12*	4$^-$		
5415[#] *5*			
5505[#] *5*			
5573[#] *5*			
5597[#] *5*			
5700[#] *5*			
5719[#] *5*			
7202.4[‡] *15*	(7$^+$,6$^+$)	9.4 ps *12*	J$^\pi$: 2$^+$ is proposed by 2007Ra20 (see figure 2 of 2007Ra20). Private communications via e-mails between XUNDL compilers (S. Geraedts and B. Singh) and the corresponding author of 2007Ra20 (M. Saha Sarkar) made during Sept 25-Oct 6,2007 bring out the conclusion that J^π is probably 7$^+$ or 6$^+$. This assignment corroborates with the previous suggested assignment of 1978Ba76. Preliminary value of Pol(2858γ) suggests M1 favoring 6$^+$ assignment.

[†] From a least squares fit to the γ-rays, ΔE=1 keV assumed for Eγ without uncertainty. The enlisted levels are reported both in

Continued on next page (footnotes at end of table)

$^{16}O(^{16}O,pn\gamma)$ 2007Ra20,1990En08 (continued)

^{30}P Levels (continued)

1990En08 compilation and 2007Ra20, except otherwise noted.
‡ Reported only in 2007Ra20.
# Reported only in 1990En08 compilation following the $^{16}O(^{16}O,pn\gamma)$ measurements.
@ From 2007Ra20.
& From 1990En08 compilation.

$\gamma(^{30}P)$

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.†	δ†	Comments
709.1	1^+	709 *1*		0	1^+	M1+E2	+0.28 *+29−22*	Pol=+0.10 *8*.
1455.1	2^+	746 *1*	9	709.1	1^+			
		1455 *1*	100	0	1^+			Pol=−0.02 *22*.
1974.1	3^+	519 *1*	3	1455.1	2^+			
		1265 *1*	100	709.1	1^+	E2		DCO=0.91 *12* Pol=+0.09 *10*.
		1974 *1*	76	0	1^+			
2539.2	3^+	565 *1*	1	1974.1	3^+			
		1830 *1*	6	709.1	1^+			
		2539 *1*	100	0	1^+			
2840.2	3^+	1385 *1*	73	1455.1	2^+			
		2131 *1*	100	709.1	1^+			
		2840 *1*	47	0	1^+			
4144.3	2^-	2170 *1*		1974.1	3^+			
		2689 *1*	10	1455.1	2^+			
		3435 *1*	5	709.1	1^+			
		4144 *1*	100	0	1^+			
4183.3	2^+	1644 *1*	100	2539.2	3^+			Pol=−0.05 *15*.
		2209 *1*	93	1974.1	3^+			
		3474 *1*		709.1	1^+			
		4183 *1*		0	1^+			
4232.3	4^-	1392 *1*	5	2840.2	3^+			
		1693 *1*	34	2539.2	3^+			
		2258 *1*	100	1974.1	3^+			Pol=+0.16 *13*.
		4232 *1*	2	0	1^+			
4344.2	5^+	2370 *1*		1974.1	3^+			Pol=+0.09 *15*.
4926.3	5^-	694 *1*	100	4232.3	4^-	M1+E2	+0.30 *+46−20*	DCO=1.12 *23* δ: as per Fig. 4 of 2007Ra20. Pol=−0.24 *10*.
		3471 *1*	6	1455.1	2^+			
		4926 *1*		0	1^+			
5232.3	4^-	3258 *1*		1974.1	3^+			
7202.4	$(7^+,6^+)$	2858 *1*		4344.2	5^+			Pol=−0.48 *22* (preliminary value communicated by e-mail on Sept 25, 2007, to XUNDL compiler from M. Saha Sarkar, possibly a magnetic transition).

† From 2007Ra20.

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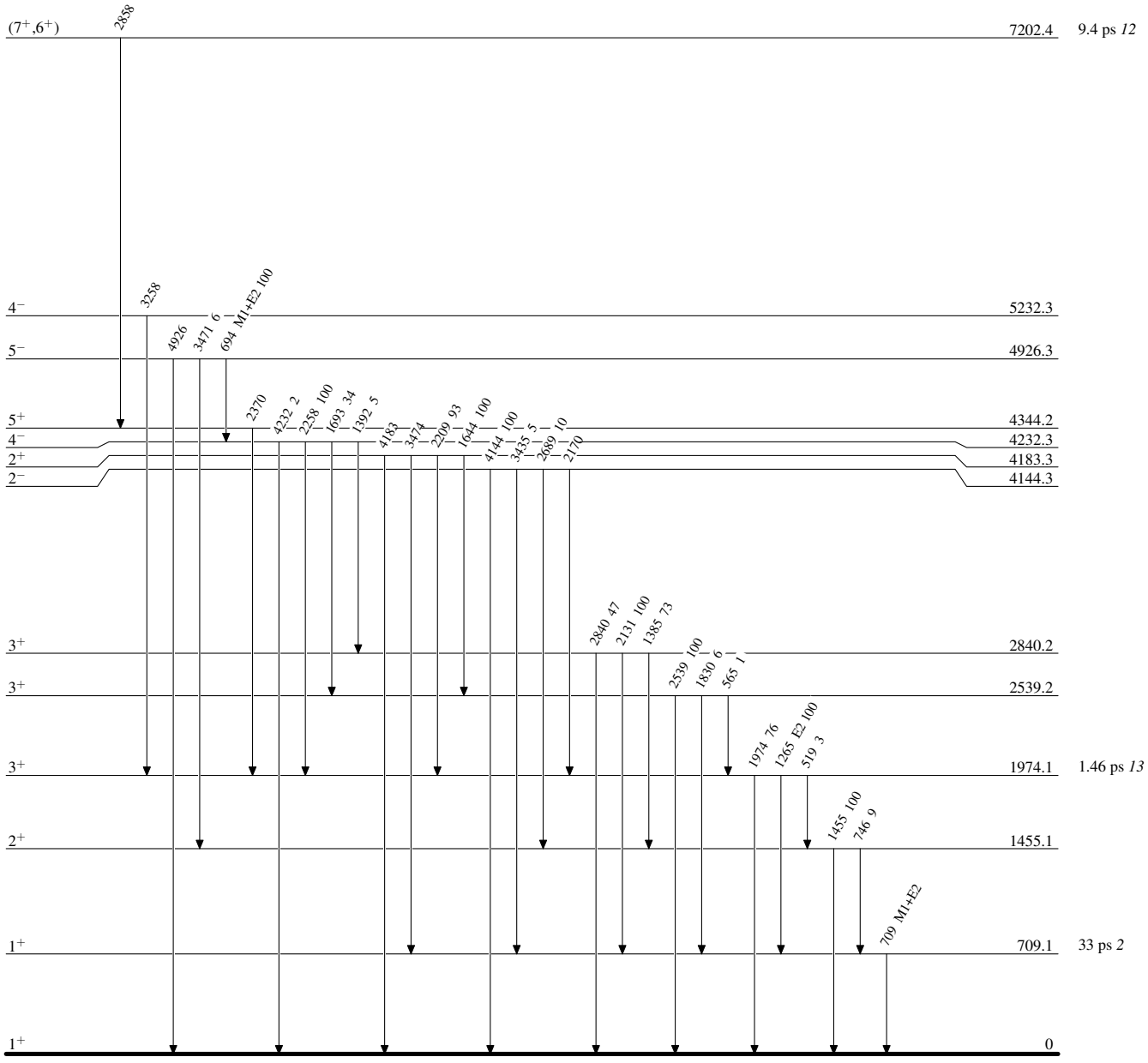
Level Scheme

Intensities: Relative photon branching from each level



$^{30}_{15}P_{15}$