

¹¹⁰Pd(¹⁸O,p4n γ) **1997Ba56**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 174, 1 (2021)	15-Apr-2021

1997Ba56 (also **1997Bb12**): E=75 MeV ¹⁸O beam was produced from the XTU tandem accelerator of the Laboratori Nazionali di Legnaro. γ rays were detected with the GASP array consisting of 40 large-volume Compton-suppressed Ge detectors and an inner ball of 80 BGO counters and charged particles were detected with a spectrometer consisting of 40 E- Δ E silicon-detector telescopes. Measured E γ , I γ , $\gamma\gamma$ -coin, $\gamma\gamma$ (DCO), particle- $\gamma\gamma$ -coin. Deduced levels, J, π , band structure, γ -ray multipolarities. Comparisons with total Routhian surface (TRS) cranking calculations.

¹²³I Levels

E(level) [†]	J π [@]	E(level) [†]	J π [@]	E(level) [†]	J π [@]	E(level) [†]	J π [@]
0.0	5/2 ⁺	2613.4 ^{&} 8	23/2 ⁻	6424.1 9	(41/2 ⁻)	7579.0 ^{#&} 10	(45/2)
138.4 4	7/2 ⁺	3511.9 ^{&} 8	(27/2 ⁻)	6776.9 ^{&} 9	(43/2 ⁻)	7885.2 13	
671.1 4	9/2 ⁺	4326.4 ^{&} 8	(31/2 ⁻)	6783.9 11		8023.3 13	
943.6 ^{&} 7	11/2 ⁻	5001.0 ^{&} 9	(35/2 ⁻)	7029.7 10	(43/2 ⁻)	8314.5 14	
1452.8 ^{&} 7	15/2 ⁻	5591.9 ^{&} 9	(39/2 ⁻)	7179.2 10		8569.8 ^{&} 11	(47/2)
2039.4 ^{&} 7	19/2 ⁻	6092.4 [‡] 13		7549.2 11		8985.0 14	

[†] From a least-squares fit to γ -ray energies.

[‡] This level perhaps decays to 5002 and 2614 levels. But the γ rays have not been observed.

[#] The order of 991 γ -802 γ cascade is reversed in Adopted Gammas, resulting in a level at 7766 instead of 7579 in **1997Ba56**.

[@] Proposed by **1997Ba56**, based on $\gamma\gamma$ (DCO), band assignments and known assignments for low-lying states. Parenthesis are added by the evaluator due to lack of firm experimental evidence.

[&] Seq.(A): Sequence based on 943.6, 11/2⁻. Configuration=1h_{11/2}.

γ (¹²³I)

E γ [†]	I γ [†]	E _i (level)	J π _i	E _f	J π _f	Mult. [@]	Comments
138.4 [‡]		138.4	7/2 ⁺	0.0	5/2 ⁺		
245.8 5	<2	7029.7	(43/2 ⁻)	6783.9			
272.5 [‡]		943.6	11/2 ⁻	671.1	9/2 ⁺		
291.2 5	2.8 5	8314.5		8023.3			
336.0 5	<2	7885.2		7549.2			
352.7 2	11.3 5	6776.9	(43/2 ⁻)	6424.1	(41/2 ⁻)	(D+Q)	Mult.: DCO=0.66 7.
474.1 5	3.4 3	8023.3		7549.2		(D)	Mult.: DCO=0.66 33.
509.2 2		1452.8	15/2 ⁻	943.6	11/2 ⁻	Q	Mult.: DCO=1.01 4.
519.5 5	6.9 5	7549.2		7029.7	(43/2 ⁻)	(D+Q)	Mult.: DCO=0.72 19.
532.7 [‡]		671.1	9/2 ⁺	138.4	7/2 ⁺		
574.0 2	95.7 14	2613.4	23/2 ⁻	2039.4	19/2 ⁻	Q	Mult.: DCO=1.12 4.
586.6 2	100.0 11	2039.4	19/2 ⁻	1452.8	15/2 ⁻	Q	Mult.: DCO=0.99 3.
590.9 2	42.4 8	5591.9	(39/2 ⁻)	5001.0	(35/2 ⁻)	Q	Mult.: DCO=1.23 3.
605.6 5	8.0 10	7029.7	(43/2 ⁻)	6424.1	(41/2 ⁻)	(D+Q)	Mult.: DCO=0.77 17.
671.1 [‡]		671.1	9/2 ⁺	0.0	5/2 ⁺		
674.6 2	55.0 11	5001.0	(35/2 ⁻)	4326.4	(31/2 ⁻)	Q	Mult.: DCO=1.05 6.
691.5 5	<2	6783.9		6092.4			
755.1 5	<2	7179.2		6424.1	(41/2 ⁻)		
802.1 [#] 5	8.3 5	7579.0	(45/2)	6776.9	(43/2 ⁻)	D	Mult.: DCO=0.37 14.
814.5 2	65.1 9	4326.4	(31/2 ⁻)	3511.9	(27/2 ⁻)	Q	Mult.: DCO=1.07 4.
832.1 2	21.7 5	6424.1	(41/2 ⁻)	5591.9	(39/2 ⁻)	(D+Q)	Mult.: DCO=0.54 5.

Continued on next page (footnotes at end of table)

$^{110}\text{Pd}(^{18}\text{O,p}4\text{n}\gamma)$ **1997Ba56** (continued) $\gamma(^{123}\text{I})$ (continued)

E_γ †	I_γ †	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. @	Comments
898.5 2	79.1 16	3511.9	(27/2 ⁻)	2613.4	23/2 ⁻	Q	Mult.: DCO=1.13 4.
961.7 5	<2	8985.0		8023.3			
990.8 # 5	7.5 5	8569.8	(47/2)	7579.0	(45/2)	D	Mult.: DCO=0.65 16.
1185.0 2	10.3 8	6776.9	(43/2 ⁻)	5591.9	(39/2 ⁻)	Q	Mult.: DCO=1.17 25.

† From **1997Ba56**, unless otherwise noted. The E_γ uncertainties are 0.2 keV for strong transitions to 0.5 keV for weak transitions from a general statement in **1997Ba56**. Based on that, the evaluator has assigned 0.2 keV for $I_\gamma > 10$ and 0.5 keV for $I_\gamma < 10$. Values of I_γ are normalized to $I_\gamma(586.6) = 100.0$ 11.

‡ Rounded values from Adopted Gammas.

The order of 991 γ -802 γ cascade is reversed in Adopted Gammas, resulting in a level at 7766 instead of 7579 in **1997Ba56**.

@ From $\gamma\gamma(\text{DCO})$ in **1997Ba56**. Typical DCO ratios are ≈ 0.5 for stretched dipole ($\Delta J = 1$) and ≈ 1.0 for stretched quadrupole ($\Delta J = 2$), with gates on stretched quadrupole transitions.

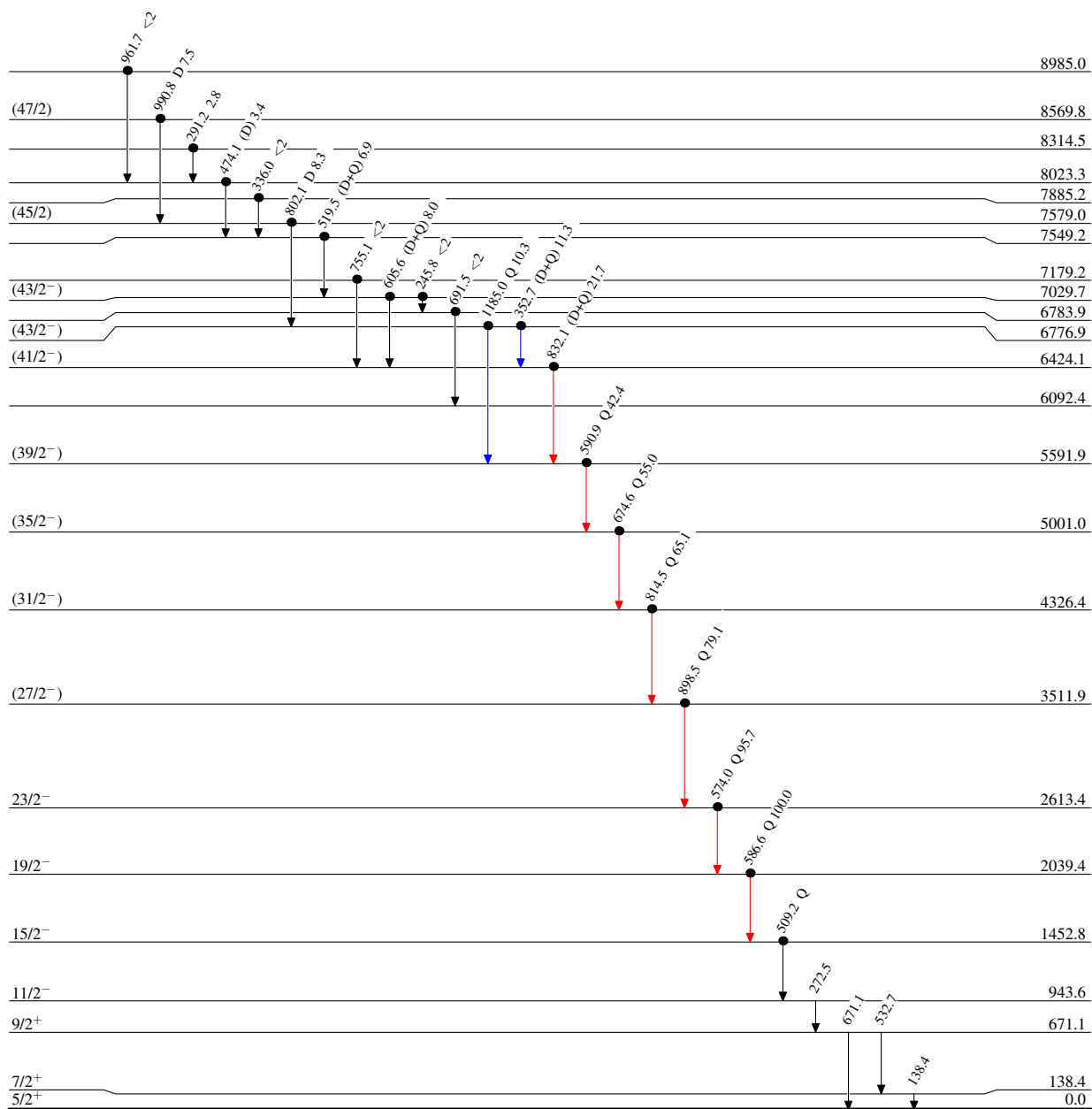
$^{110}\text{Pd}(^{18}\text{O},\text{p}4\text{n}\gamma)$ 1997Ba56

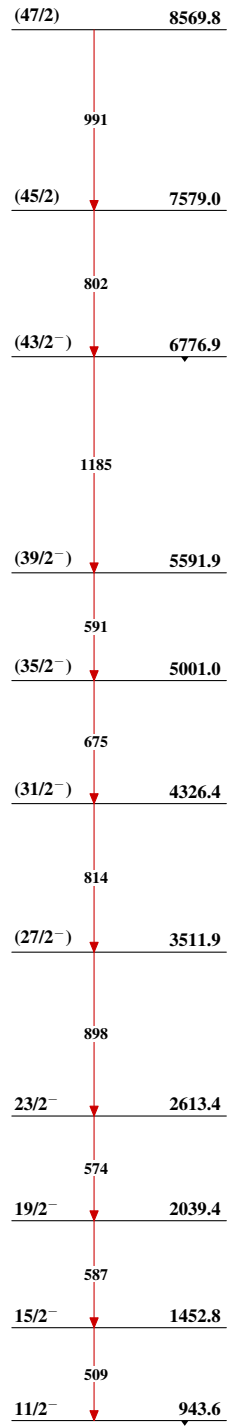
Legend

Level Scheme

Intensities: Relative I_γ

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



$^{110}\text{Pd}(^{18}\text{O},\text{p}4\text{n}\gamma) \quad ^{1997}\text{Ba}56$ Seq.(A): Sequence based
on 943.6, $11/2^-$  $^{123}_{53}\text{I}_{70}$