

¹⁰⁴Ru($\alpha,2n\gamma$) 1972Gr17,1986An03

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	D. De Frenne and A. Negret		NDS 109, 943 (2008)	1-May-2007

1972Gr17: E α =32 MeV. Measured: E γ , I γ , $\gamma(\theta)$. Deduced: ¹⁰⁶Pd levels, J $^\pi$.

1986An03: E α =27 MeV. Measured: E γ , I γ , $\alpha\gamma(t)$. Deduced: ¹⁰⁶Pd levels, T_{1/2}, B(EL), B(ML). Enriched targets.

Other: 1970SiZK.

¹⁰⁶Pd Levels

Partial level scheme is constructed to agree with Adopted Levels.

E(level)	J $^\pi$ [†]	E(level)	J $^\pi$ [†]	T _{1/2} [‡]	E(level)	J $^\pi$ [†]	T _{1/2} [‡]
0.0	0 ⁺	2228.7?			2998.3 7	(8 ⁻)	<0.2 ns
511.87 24	2 ⁺	2306.0 4	4 ⁻	2.0 ns 5	3177.0 7	(8 ⁻)	
1127.84 24	2 ⁺	2350.5 4	4 ⁺		3289.1 7	(9 ⁻)	0.2 ns I
1229.0 4	4 ⁺	2365.8 4	5 ⁺		3461.7	9 ⁽⁻⁾	0.25 ns IO
1557.4 3	3 ⁺	2397.4 4	(5) ⁻		3532.6 7	10 ⁺	
1562.0 4	2 ⁺	2578.5?	(4 ⁻)		3653.6 7	10 ⁽⁻⁾	
1932.4 4	4 ⁺	2699.0 7	(6) ⁻	0.5 ns I	3948. 7	(10 ⁺)	
2076? 5	4 ⁺	2757.0 5	5 ⁺		4021.0 7	11 ⁽⁻⁾	
2076.9 5	6 ⁺	2793.3 6	(7 ⁻)				
2084.2 4	3 ⁻	2962.2 6	8 ⁺				

[†] From Adopted Levels.

[‡] From 1986An03.

$\gamma(^{106}\text{Pd})$

Isotopic assignments are consistent with excit, E α =26-43 MeV.

γ placements are consistent with $\gamma\gamma$ spectra of 1977Ti01 (¹⁰⁶Ag decay) and 1976Gr12 ⁹⁶Zr(¹³C,3n γ).

$\Delta I\gamma$: Uncertainty $\pm 10\%$ for strong lines, up to $\pm 50\%$ if weak.

E γ [†]	I γ [†]	E _i (level)	J $^\pi$ _i	E _f	J $^\pi$ _f	Comments
204.8 3	4.7	2998.3	(8 ⁻)	2793.3	(7 ⁻)	
221.4 3	1.4	2306.0	4 ⁻	2084.2	3 ⁻	
228.7 3	0.6	2306.0	4 ⁻	2076.9	6 ⁺	
^x 238.1	4.2					
285.0 5	0.4	3461.7	9 ⁽⁻⁾	3177.0	(8 ⁻)	E γ : taken from ⁹⁶ Zr(¹³ C,3n γ) (1976Gr12). I γ : from 1986An03.
291.0 3	3.0	3289.1	(9 ⁻)	2998.3	(8 ⁻)	
299.7 3	6.6	2998.3	(8 ⁻)	2699.0	(6) ⁻	
302.2 3	12.5	2699.0	(6) ⁻	2397.4	(5) ⁻	
384.1 3	3.4	3177.0	(8 ⁻)	2793.3	(7 ⁻)	
396.2 3	15	2793.3	(7 ⁻)	2397.4	(5) ⁻	
429.6 3	3.1	1557.4	3 ⁺	1127.84	2 ⁺	
451.0 3	≤ 0.2	2757.0	5 ⁺	2306.0	4 ⁻	
^x 459.3	≈ 1					
477.7 3	5	3177.0	(8 ⁻)	2699.0	(6) ⁻	
495.7 3	3.6	3289.1	(9 ⁻)	2793.3	(7 ⁻)	
511.8 3	<200	511.87	2 ⁺	0.0	0 ⁺	I γ : includes γ^\pm component.
570.4 3	18	3532.6	10 ⁺	2962.2	8 ⁺	

Continued on next page (footnotes at end of table)

$^{104}\text{Ru}(\alpha,2n\gamma)$ 1972Gr17,1986An03 (continued) $\gamma(^{106}\text{Pd})$ (continued)

E_γ^\dagger	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
616.1 3	≈ 5	1127.84	2 ⁺	511.87	2 ⁺	
655.3 3	4.2	3653.6	10 ⁽⁻⁾	2998.3	(8 ⁻)	
^x 667.7	≈ 3					
703 3	≤ 5	1932.4	4 ⁺	1229.0	4 ⁺	
717.1 [#] 3	88 [#]	1229.0	4 ⁺	511.87	2 ⁺	I_γ : from doublet $I_\gamma(717\gamma)=100$ minus $I_\gamma=12$ for the component from the 2794 level.
717.1 [#] 3	12 [#] CA	2793.3	(7 ⁻)	2076.9	6 ⁺	
731.9 3	3.5	4021.0	11 ⁽⁻⁾	3289.1	(9 ⁻)	
^x 745.6	2.7					
748.9 3	3	2306.0	4 ⁻	1557.4	3 ⁺	
792.9 3	≈ 2	2350.5	4 ⁺	1557.4	3 ⁺	
804.6 3	≈ 4	1932.4	4 ⁺	1127.84	2 ⁺	
808.4 3	4	2365.8	5 ⁺	1557.4	3 ⁺	
824 3	≤ 1	2757.0	5 ⁺	1932.4	4 ⁺	
847.2 3	65	2076.9	6 ⁺	1229.0	4 ⁺	
^x 877.5	2.7					
886.0 3	29	2962.2	8 ⁺	2076.9	6 ⁺	
986.0 3	5	3948.	(10 ⁺)	2962.2	8 ⁺	
999.8 [@] 3	3	2228.7?		1229.0	4 ⁺	
1045.7 3	5.7	1557.4	3 ⁺	511.87	2 ⁺	
1050.1 3	2	1562.0	2 ⁺	511.87	2 ⁺	
1127.9 3	4.7	1127.84	2 ⁺	0.0	0 ⁺	
1168.3 3		2397.4	(5 ⁻)	1229.0	4 ⁺	
1222.8 3	2.5	2350.5	4 ⁺	1127.84	2 ⁺	
1349.6 [@] 3	2.2	2578.5?	(4 ⁻)	1229.0	4 ⁺	
^x 1367.9	2					
^x 1454.6	3.8					
1565 [@] 3	≤ 0.6	2076?	4 ⁺	511.87	2 ⁺	
1572.0 3	2.2	2084.2	3 ⁻	511.87	2 ⁺	

[†] Unless noted otherwise, taken from 1972Gr17. Data obtained at $E\alpha=32$ MeV and averaged over the results for $\theta=90^\circ, 125^\circ, 150^\circ$.

[‡] Uncertainty $\pm 10\%$ for strong lines, up to $\pm 50\%$ if weak.

[#] Multiply placed with intensity suitably divided.

[@] Placement of transition in the level scheme is uncertain.

^x γ ray not placed in level scheme.

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Level Scheme

Intensities: Type not specified
@ Multiply placed: intensity suitably divided

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)

