

¹⁰⁴Ru(α,γ) **1976K101**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 109, 1383 (2008)	1-Mar-2008

Additional information 1.

E(α)=11-18 MeV.

1976K101 analyzed (α,γ) data for ¹⁰⁷Pd band structures in analogy with ¹⁰¹Pd, ¹⁰³Pd, ¹⁰⁵Pd; see 1976Sm06.

¹⁰⁷Pd Levels

E(level)	J ^{π} [†]	T _{1/2}	Comments
0.0	5/2 ⁺	6.5×10 ⁶ y 3	
115.8 10	1/2 ⁺	0.85 μ s 10	E(level): low-lying 1/2 ⁺ state occurs at 113.4 keV in ¹⁰⁹ Pd, and at 72 keV in ¹¹¹ Pd.
214.9 [#] 10	11/2 ⁻	21.3 s 5	
303.1 10	5/2 ⁺		
312.8 [‡] 10	7/2 ⁺		
366.8 10	7/2 ⁺		
392.50 20	7/2 ⁺		
471.2 3	(3/2) ⁺		
670.4 10	5/2 ⁺		
688.1 [#] 15	15/2 ⁻		
696.2 15			E(level): decays to 5/2 ⁺ , may correspond to 1/2 ⁺ level at 698,699 in (d,p) and (d,t).
956.1 [‡] 15	(11/2) ⁺		
1064.6 [#] 18	13/2 ⁻		
1101.7 15	(7/2 ⁺)		
1445.0 [#] 18	19/2 ⁻		
1472.3 15	(3/2 ⁻)		
1764.6 [‡] 18	(15/2) ⁺		

[†] From Adopted Levels.

[‡] Band(A): 7/2⁺ decoupled band; $\Delta J=2$ sequence populated up to 15/2⁺.

[#] Band(B): 11/2⁻ band.

γ (¹⁰⁷Pd)

γ placements are based on $\gamma\gamma$ -coin, I γ , excitation functions.

Measured γ -ray angular distribution at 8 angles ($\theta=0^\circ-90^\circ$) via E $\alpha=16.5$ MeV; A₂,A₄ coefficients derived.

δ magnitude from A₂,A₄ coef (exp vs theory) for J(initial,final).

ΔE : Uncertainties not given; ± 0.5 keV assumed.

E γ	I γ [†]	E _i (level)	J _i ^{π}	E _f	J _f ^{π}	Mult.	Comments
115.8	8	115.8	1/2 ⁺	0.0	5/2 ⁺	E2	Mult.: from $\alpha(K)\text{exp}$, ¹⁰⁷ Rh β^- decay.
214.9	258	214.9	11/2 ⁻	0.0	5/2 ⁺	E3	Mult.: from $\alpha(K)\text{exp}$, ¹⁰⁷ Pd IT decay.
303.1	75	303.1	5/2 ⁺	0.0	5/2 ⁺	D+Q	δ : +1.73 $\leq\delta\leq$ -0.05 from A ₂ =0.35 9, A ₄ =-0.05 9. Deexcites a 696 level in (HI,xny) and Adopted Levels.
312.8	100	312.8	7/2 ⁺	0.0	5/2 ⁺	D+Q	δ : -0.05 +2-3 from A ₂ =-0.404 17, A ₄ =-0.030 25.
366.8	36	366.8	7/2 ⁺	0.0	5/2 ⁺	D+Q	δ : -0.16 +10-8 or -2.4 +6-7 from A ₂ =-0.252 13, A ₄ =-0.022 17.
376.5	28	1064.6	13/2 ⁻	688.1	15/2 ⁻	(D+Q)	δ : +0.06 $\leq\delta\leq$ -1.2 from A ₂ =-0.10 16, A ₄ =0.38 21.
392.5 2	<80	392.50	7/2 ⁺	0.0	5/2 ⁺		E γ : from 1969Gr18, ¹⁰⁷ Rh decay.
393.1	<80	696.2		303.1	5/2 ⁺		I γ : doublet deduced from level intensity balance. A ₂ =-0.586 13, A ₄ =0.084 23; (γ doublet)(θ).

Continued on next page (footnotes at end of table)

$^{104}\text{Ru}(\alpha, n\gamma)$ **1976KI01 (continued)** $\gamma(^{107}\text{Pd})$ (continued)

E_γ	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	Comments
471.2 3	<243	471.2	(3/2) ⁺	0.0	5/2 ⁺		E_γ : from 1969Gr18, ^{107}Rh decay.
473.2	<243	688.1	15/2 ⁻	214.9	11/2 ⁻	(Q)	I_γ : doublet from observed line width. Mult.: $A_2=0.67$ 6, $A_4=0.01$ 5; (γ doublet)(θ) suggests strong E2 component.
643.3	54	956.1	(11/2) ⁺	312.8	7/2 ⁺	Q	$E_\gamma=643.9$ 8 also observed in ^{107}Rh decay (1969Gr18). Mult.: E2 deduced from $A_2=0.41$ 12, $A_4=-0.13$ 11.
670.4	25	670.4	5/2 ⁺	0.0	5/2 ⁺	D+Q	δ : -0.10 +8-11 or $+2.0$ +4-3 from $A_2=0.263$ 35, $A_4=-0.11$ 3.
756.9	28	1445.0	19/2 ⁻	688.1	15/2 ⁻	Q	Mult.: E2 deduced from $A_2=0.39$ 5, $A_4=-0.02$ 5.
788.9	45	1101.7	(7/2 ⁺)	312.8	7/2 ⁺	D+Q	δ : $+2.9 \leq \delta \leq +0.6$ from $A_2=0.55$ 9, $A_4=0.17$ 9.
808.5	39	1764.6	(15/2) ⁺	956.1	(11/2) ⁺	Q	Mult.: E2 deduced from $A_2=0.48$ 8, $A_4=0.00$ 8.
1169.2	<78	1472.3	(3/2 ⁻)	303.1	5/2 ⁺		I_γ : probable doublet suggested by level intensity balance. $A_2=-0.33$ 3, $A_4=0.12$ 4.

[†] Relative photon intensity at $E_\alpha=16.5$ MeV; semi γ singles.

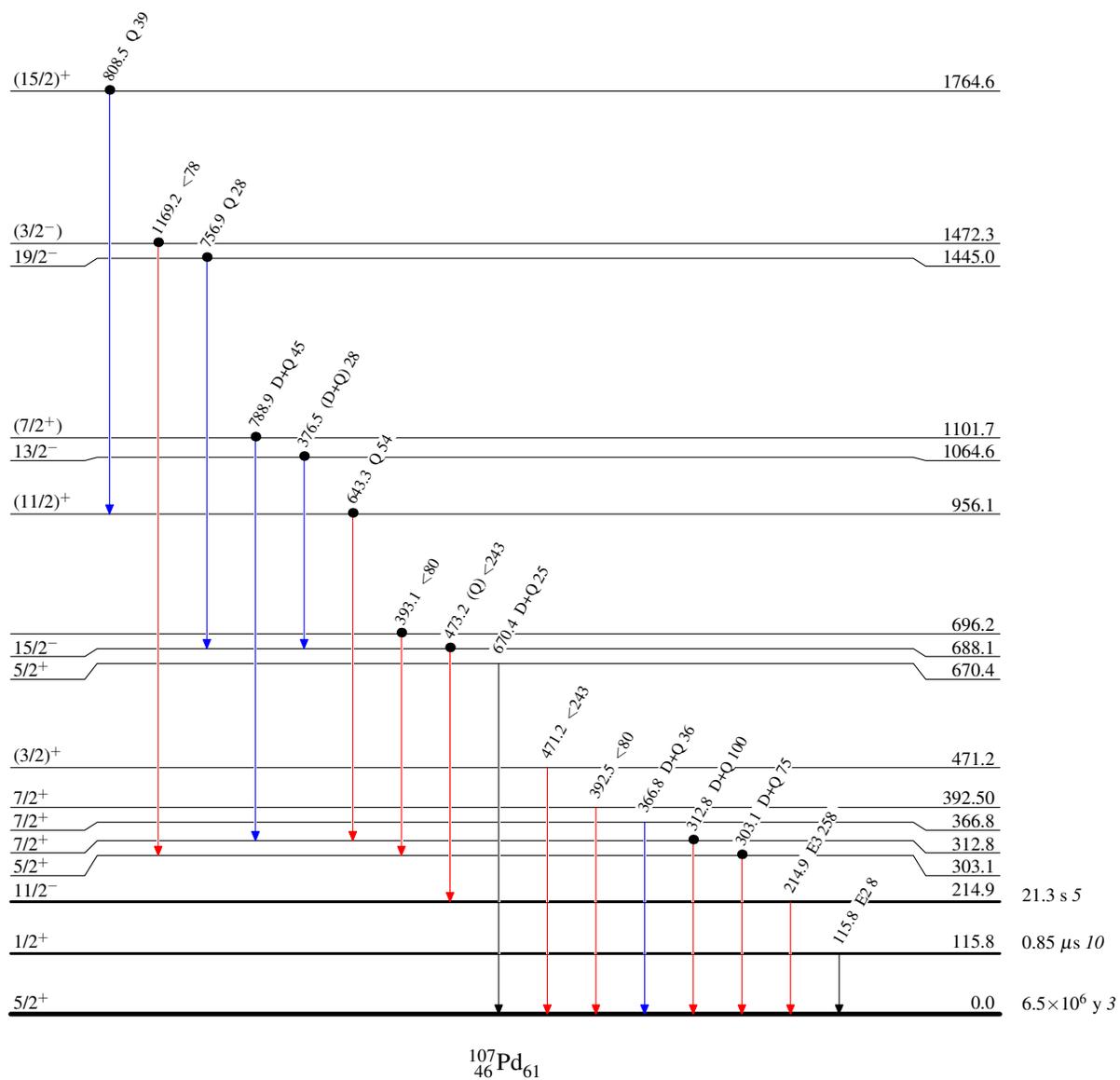
[‡] Uncertainties not given; ± 0.5 keV assumed.

$^{104}\text{Ru}(\alpha, n\gamma)$ 1976K101

Legend

Level Scheme
 Intensities: Relative I_γ

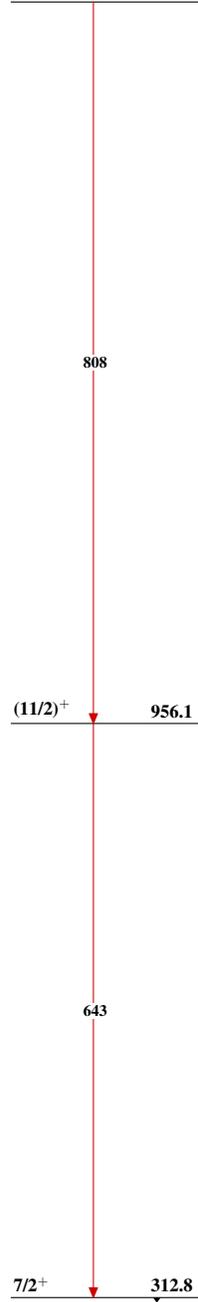
- $I_\gamma < 2\% \times I_\gamma^{\max}$
- $I_\gamma < 10\% \times I_\gamma^{\max}$
- $I_\gamma > 10\% \times I_\gamma^{\max}$
- Coincidence



$^{104}\text{Ru}(\alpha, n\gamma)$ 1976KI01

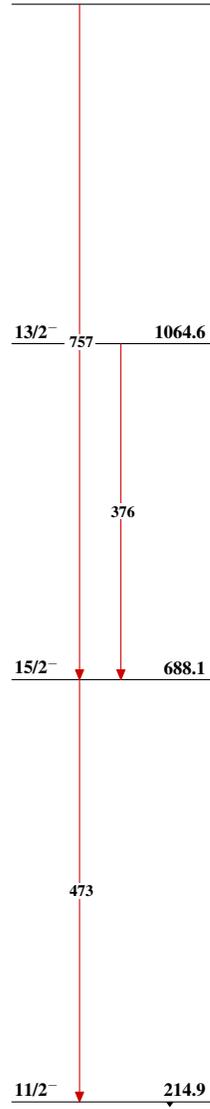
Band(A): $7/2^+$ decoupled
band; $\Delta J=2$ sequence
populated up to $15/2^+$

$(15/2)^+$ 1764.6



Band(B): $11/2^-$ band

$19/2^-$ 1445.0



$^{107}_{46}\text{Pd}_{61}$