

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	G. Gürdal and F. G. Kondev		NDS 113,1315 (2012)	1-Aug-2011

$Q(\beta^-)=5503$ 18; $S(n)=5900$ 19; $S(p)=9382$ 20; $Q(\alpha)=-5479$ 22 [2012Wa38](#)

Note: Current evaluation has used the following Q record 5505 185904 189398 21 -5495 22 [2011AuZZ](#).

 ^{110}Rh LevelsCross Reference (XREF) Flags

- A** ^{110}Ru β^- decay
B ^{252}Cf SF decay
C (HI,xn γ)
D $^{208}\text{Pb}(^{18}\text{O},X\gamma)$

E(level) [†]	J $^\pi$	T _{1/2}	XREF	Comments
0.0	(1 ⁺)	3.35 s 12	A	$\% \beta^- = 100$ J $^\pi$: Direct population of 0 ⁺ and 2 ⁺ states in ^{110}Pd following ^{110}Rh β^- (3.35 s) decay. T _{1/2} : Weighted average of 3.0 s 2 (from $\beta(t)$ in 1970Pi01), 3.1 s 2 (from $374\gamma(t)$ in 1970Pi01), 3.3 s 3 (from $374\gamma(t)$ in 1978Fr16) and 3.5 s 1 (from $374\gamma(t)$ in 1986KaZS). Other: 5.0 s 8 (from $374\gamma(t)$ in 1963Ka21). configuration: Probable $\pi 7/2^+ [413](g_{9/2}) \otimes \nu 5/2^+ [413](g_{7/2})$ (for prolate deformation) based on the systematics of the neighboring odd-Ru and odd-Pd nuclei. The Gallagher-Moszkowski rule favors the J $^\pi=1^+$ assignment.
0.0+y	(6 ⁺)	28.0 s 13	ABCD	$\% \beta^- = 100$ Additional information 1. J $^\pi$: Direct population of (5 ⁺) state of ^{110}Pd in ^{110}Rh β^- (28.0 s) decay. T _{1/2} : Weighted average of 28.5 s 15 (from $374\gamma(t)$ in coincidence with $500 < E\beta < 2005$ keV) and 26 s 3 (from $374\gamma(t)$ in 1970Pi01). Other: 34 s 4 (from $\gamma(t)$ in 1970Wa28). configuration: Probable $\pi 7/2^+ [413](g_{9/2}) \otimes \nu 5/2^+ [413](g_{7/2})$ (for prolate deformation).
58.9+y [‡] 5	(6 ⁻)		B D	J $^\pi$: 58.9 γ E1 to (5 ⁺ , 6 ⁺). configuration: $\pi 7/2^+ [413](g_{9/2}) \otimes \nu 5/2^- [532](h_{11/2})$ (for prolate deformation).
112.19 9	1 ⁺		A	J $^\pi$: 112.2 γ M1 to (1 ⁺); direct population in ^{110}Ru β^- decay (J $^\pi=0^+$);
124.7+y [#] 7	(7 ⁻)		B D	J $^\pi$: 65.8 γ M1+E2 to (6 ⁻). T _{1/2} : Note that 16 ns 4 from 65.8 $\gamma(t)$ in 2004Lu03 . However, if this level is a band-member, then the lifetime should originate from another state. The assignment is tentative.
166.15 15	(1)		A	J $^\pi$: direct population in ^{110}Ru β^- decay (J $^\pi=0^+$).
200.4 5	(1)		A	J $^\pi$: direct population in ^{110}Ru β^- decay (J $^\pi=0^+$).
228.26 21	(1)		A	J $^\pi$: direct population in ^{110}Ru β^- decay (J $^\pi=0^+$).
251.60 14	(1)		A	J $^\pi$: direct population in ^{110}Ru β^- decay (J $^\pi=0^+$).
284.0+y [‡] 8	(8 ⁻)		BCD	J $^\pi$: 159.3 γ M1+E2 to (7 ⁻); band assignment.
470.8+y [#] 8	(9 ⁻)		BCD	J $^\pi$: 186.8 γ to (8 ⁻), 346.1 γ to (7 ⁻); band assignment.
667.1 3	(1)		A	J $^\pi$: direct population in ^{110}Ru β^- decay (J $^\pi=0^+$).
770.7+y [‡] 9	(10 ⁻)		BCD	J $^\pi$: 299.9 γ to (9 ⁻), 486.7 γ to (8 ⁻); band assignment.
1028.7+y [#] 9	(11 ⁻)		BCD	J $^\pi$: 258.01 γ to (10 ⁻), 557.9 γ to (9 ⁻); band assignment.
1391.0+y [‡] 9	(12 ⁻)		BCD	J $^\pi$: 362.3 γ to (11 ⁻), 620.3 γ to (10 ⁻); band assignment.
1766.2+y [#] 10	(13 ⁻)		BCD	J $^\pi$: 375.3 γ to (12 ⁻), 737.5 γ to (11 ⁻); band assignment.

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Adopted Levels, Gammas (continued) ^{110}Rh Levels (continued)† From least-square fit to $E\gamma$'s.‡ Band(a): $\pi g_{9/2} \otimes \nu h_{11/2}$, $\alpha=0$.# Band(A): $\pi g_{9/2} \otimes \nu h_{11/2}$, $\alpha=1$. $\gamma(^{110}\text{Rh})$

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult.	$\alpha^\#$	Comments
58.9+y	(6 ⁻)	58.9 [‡] 5	100 [‡]	0.0+y	(6 ⁺)	E1	0.663	$\alpha(\text{K})=0.576$ 8; $\alpha(\text{L})=0.0717$ 10; $\alpha(\text{M})=0.01320$ 19; $\alpha(\text{N}+..)=0.00220$ 3 $\alpha(\text{N})=0.00212$ 3; $\alpha(\text{O})=8.54 \times 10^{-5}$ 12 Mult.: $\alpha(\text{exp})$ deduced from intensity balance in 2004Lu03 .
112.19	1 ⁺	112.2 1	100	0.0	(1 ⁺)	M1	0.250	Mult.: From $\alpha(\text{K})_{\text{exp}}=0.19$ 4 (from ce data) and $\alpha(\text{K})_{\text{exp}}=0.22$ 15 (from Ge(γ)-Ge(γ /x) coincidence data) in 1991Jo11 .
124.7+y	(7 ⁻)	65.8 [‡] 5	100 [‡]	58.9+y	(6 ⁻)	M1+E2	3.6 25	$\alpha(\text{K})=2.6$ 17; $\alpha(\text{L})=0.8$ 7; $\alpha(\text{M})=0.15$ 14; $\alpha(\text{N}+..)=0.024$ 20 $\alpha(\text{N})=0.023$ 20; $\alpha(\text{O})=0.00038$ 20 Mult.: $\alpha(\text{exp})=1.49$ 5, using intensity balance in 2004Lu03 .
166.15	(1)	54.0 2	62 12	112.19	1 ⁺			
		166.1 2	100 30	0.0	(1 ⁺)			
200.4	(1)	88.2 5	100	112.19	1 ⁺			
228.26	(1)	116.1 2	100	112.19	1 ⁺			
251.60	(1)	85.4 5	43 14	166.15	(1)			
		139.4 2	67 38	112.19	1 ⁺			
		251.6 2	100 33	0.0	(1 ⁺)			
284.0+y	(8 ⁻)	159.3 [‡] 5	100 [‡]	124.7+y	(7 ⁻)	M1+E2	0.17 8	$\alpha(\text{K})=0.15$ 7; $\alpha(\text{L})=0.023$ 13; $\alpha(\text{M})=0.0043$ 25; $\alpha(\text{N}+..)=0.0007$ 4 $\alpha(\text{N})=0.0007$ 4; $\alpha(\text{O})=2.4 \times 10^{-5}$ 9 Mult.: $\alpha(\text{exp})=0.09$ 5, using intensity balance in 2004Lu03 .
470.8+y	(9 ⁻)	186.8 [‡] 5	100 [‡]	284.0+y	(8 ⁻)			
		346.1 [‡] 5	2.5 [‡]	124.7+y	(7 ⁻)			
667.1	(1)	415.4 3	100 30	251.60	(1)			
		439.0 5		228.26	(1)			
		554.8 5	47 18	112.19	1 ⁺			
770.7+y	(10 ⁻)	299.9 [‡] 5	100 [‡]	470.8+y	(9 ⁻)			
		486.7 [‡] 5	23.4 [‡]	284.0+y	(8 ⁻)			
1028.7+y	(11 ⁻)	258.0 [‡] 5	100 [‡]	770.7+y	(10 ⁻)			
		557.9 [‡] 5	45 [‡]	470.8+y	(9 ⁻)			
1391.0+y	(12 ⁻)	362.3 [‡] 5	72.5 [‡]	1028.7+y	(11 ⁻)			
		620.3 [‡] 5	100 [‡]	770.7+y	(10 ⁻)			
1766.2+y	(13 ⁻)	375.3 [‡] 5	100 [‡]	1391.0+y	(12 ⁻)			
		737.5 [‡] 5	50 [‡]	1028.7+y	(11 ⁻)			

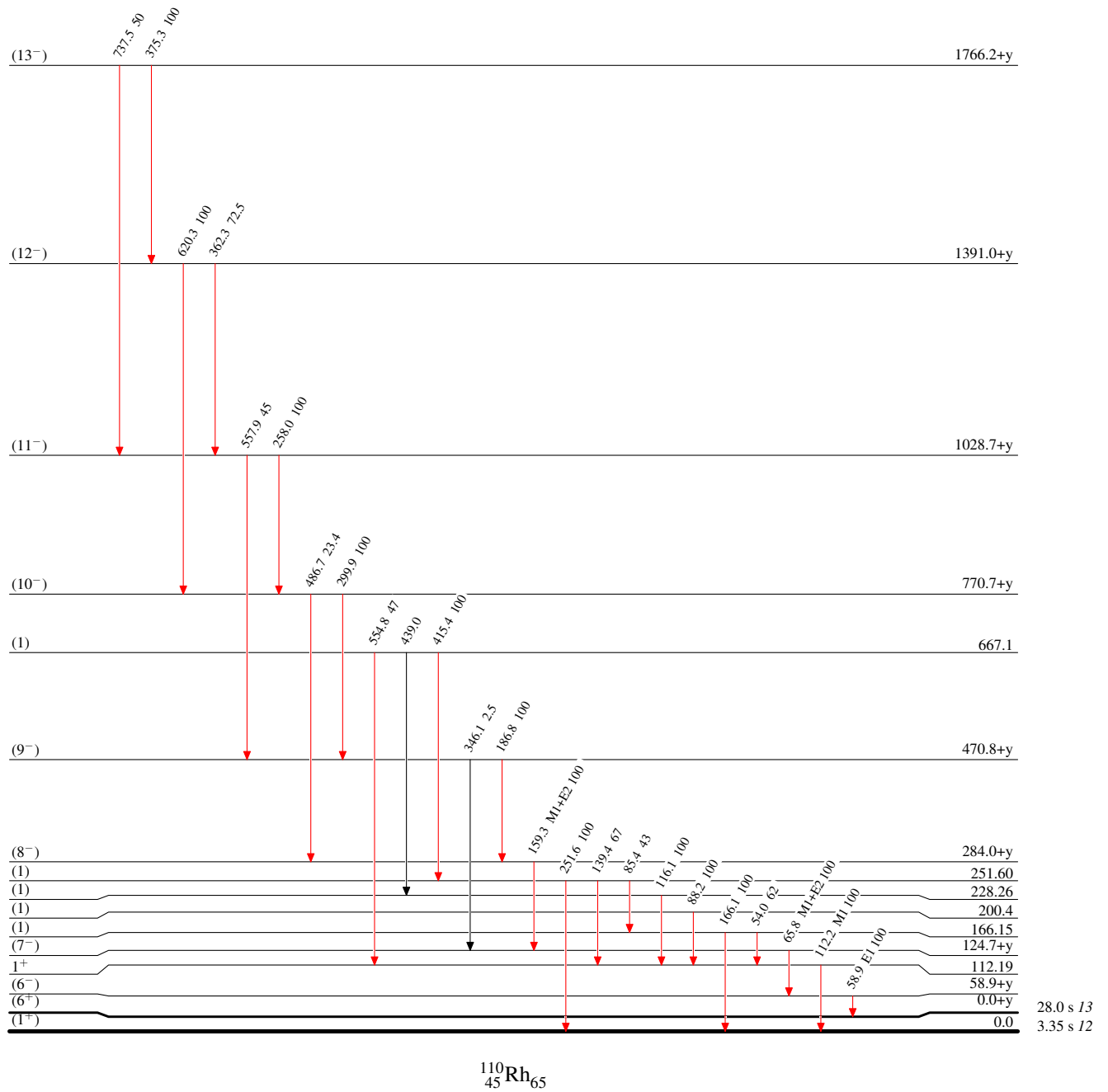
† From ^{110}Ru β^- decay in [1991Jo11](#), unless otherwise stated.‡ From ^{252}Cf SF decay in [2004Lu03](#). $\Delta E_\gamma=0.5$ keV assigned by the evaluators.# Total theoretical internal conversion coefficients, calculated using the BrIcc code ([2008Ki07](#)) with Frozen orbital approximation based on γ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

Adopted Levels, Gammas**Level Scheme**

Intensities: Type not specified

Legend

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



Adopted Levels, Gammas

