^{113}Rh β^- decay 1993Pe11

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 111, 1471 (2010)	1-May-2009

Parent: ^{113}Rh: E=0.0; J^π=(7/2$^+$); $T_{1/2}$=2.80 s *12*; Q(β^-)=5010 *40*; %β^- decay=100.0
Preliminary results given in 1992PeZX, same author.
Activity: ^{238}U(p,f), E= 20 MeV, on-line isotope separator IGISOL.
Measured: γ, $\gamma\gamma$, γ(t), ce, Ge(Li), Ge, Si(Li), elli spectrometer.
Evaluator considers the level scheme as preliminary.
α: Additional information 1.

^{113}Pd Levels

E(level)[†]	J^π	$T_{1/2}$	Comments
0.0	(5/2$^+$)	93 s *5*	$T_{1/2}$: from Adopted Levels.
35.08 *17*	(1/2$^+$)		
81.1 *3*	(9/2$^-$)	0.3 s *1*	$T_{1/2}$: from 1993Pe11. Other: 0.4 s (1992PeZX), preliminary, same authors.
151.88 *17*	(3/2$^+$)		
172.55 *21*	(1/2$^+$)		
189.60 *15*	(5/2$^+$,7/2$^+$)		
252.18 *16*	(3/2$^+$,1/2$^+$)		
349.13 *20*	(3/2$^+$,5/2$^+$,7/2$^+$)		
372.97 *22*	(1/2$^+$,3/2$^+$,5/2$^+$)		
408.8 *8*			
409.26 *18*	$^+$		
454.6 *3*			
500.34 *23*			
538.7 *4*			
730.6 *4*			
742.3 *5*			
861.2 *4*			
1081.2 *6*			

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

β^- radiations

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(3.93×10^3 *4*)	1081.2	1.0 *2*	6.23 *9*	av Eβ=1692 *19*
(4.15×10^3 *4*)	861.2	2.7 *3*	5.90 *6*	av Eβ=1797 *19*
(4.27×10^3 *4*)	742.3	0.7 *2*	6.54 *13*	av Eβ=1853 *19*
(4.28×10^3 *4*)	730.6	1.8 *2*	6.14 *6*	av Eβ=1859 *19*
(4.47×10^3 *4*)	538.7	3.6 *4*	5.92 *6*	av Eβ=1950 *19*
(4.51×10^3 *4*)	500.34	3.4 *4*	5.96 *6*	av Eβ=1969 *19*
(4.56×10^3 *4*)	454.6	2.2 *3*	6.17 *7*	av Eβ=1990 *19*
(4.60×10^3 *4*)	409.26	2.2 *3*	6.19 *7*	av Eβ=2012 *19*
(4.64×10^3 *4*)	372.97	2.2 *3*	6.20 *7*	av Eβ=2029 *19*
(4.66×10^3 *4*)	349.13	42.1 *24*	4.93 *4*	av Eβ=2041 *19*
(4.76×10^3 *4*)	252.18	1.3 *6*	6.48 *21*	av Eβ=2087 *19*
(4.82×10^3 *4*)	189.60	10.6 *9*	5.59 *5*	av Eβ=2117 *19*
(4.84×10^3 *4*)	172.55	1.4 *3*	6.48 *10*	av Eβ=2125 *19*
(4.86×10^3 *4*)	151.88	3.7 *6*	6.07 *8*	av Eβ=2135 *19*

[†] Absolute intensity per 100 decays.

$\gamma(^{113}Pd)$

Iγ normalization: assuming no β feeding to g.s. (tentative).

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α	Comments
34.9 *3*	1.2 *2*	35.08	(1/2$^+$)	0.0	(5/2$^+$)	E2	61.0 *22*	α(L)exp=29 *7* α(K)=22.8 *5*; α(L)=31.2 *14*; α(M)=6.1 *3*; α(N)=0.92 *4*; α(N+..)=0.92 *4*
79.7 *3*	2.7 *3*	252.18	(3/2$^+$,1/2$^+$)	172.55	(1/2$^+$)	M1[‡]	0.722 *13*	α(K)exp=0.56 *15* α(K)=0.627 *11*; α(L)=0.0775 *14*; α(M)=0.0146 *3*; α(N)=0.00245 *5*; α(N+..)=0.00245 *5* Mult.: the electron intensity taken from the beta-gated electron spectrum.
81.3 *3*	6.9 *4*	81.1	(9/2$^-$)	0.0	(5/2$^+$)	M2	8.47 *17*	α(K)exp=5.4 *9* α(K)=6.92 *14*; α(L)=1.27 *3*; α(M)=0.247 *5*; α(N)=0.0411 *9*; α(N+..)=0.0411 *9* B(M2)(W.u.)=0.00013 *5* Mult.: the ce(K) (79γ) (M1) is calculated and subtracted from the electron intensity.
[x]84.9 *2*	8.2 *5*					E1	0.244	
96.8 *3*	1.8 *3*	349.13	(3/2$^+$,5/2$^+$,7/2$^+$)	252.18	(3/2$^+$,1/2$^+$)			
100.4 *3*	0.7 *1*	252.18	(3/2$^+$,1/2$^+$)	151.88	(3/2$^+$)			
116.8 *2*	9.7 *5*	151.88	(3/2$^+$)	35.08	(1/2$^+$)	M1,E2	0.5 *3*	α(K)exp=0.31 *3* α(K)=0.42 *22*; α(L)=0.08 *6*; α(M)=0.015 *11*; α(N)=0.0025 *17*; α(N+..)=0.0025 *17*
[x]119.4 *3*	0.5 *1*							
120.8 *3*	2.2 *3*	372.97	(1/2$^+$,3/2$^+$,5/2$^+$)	252.18	(3/2$^+$,1/2$^+$)	E2[‡]	0.711 *12*	α(K)exp=0.57 *12* α(K)=0.567 *10*; α(L)=0.1175 *21*; α(M)=0.0226 *4*; α(N)=0.00356 *7*; α(N+..)=0.00356 *7*
[x]135.0 *2*	2.8 *3*					M1	0.1646	
137.5 *2*	7.8 *3*	172.55	(1/2$^+$)	35.08	(1/2$^+$)	M1	0.1565	α(K)exp=0.16 *3* α(K)=0.1362 *20*; α(L)=0.01665 *25*; α(M)=0.00313 *5*; α(N)=0.000527 *8*; α(N+..)=0.000527 *8*
151.8 *3*	7.4 *4*	151.88	(3/2$^+$)	0.0	(5/2$^+$)	M1	0.1194	α(K)exp=0.08 *2* α(K)=0.1039 *16*; α(L)=0.01267 *19*; α(M)=0.00239 *4*; α(N)=0.000401 *6*; α(N+..)=0.000401 *6*
157.1 *3*	5.7 *4*	409.26	+	252.18	(3/2$^+$,1/2$^+$)			
159.9 *3*	4.8 *5*	349.13	(3/2$^+$,5/2$^+$,7/2$^+$)	189.60	(5/2$^+$,7/2$^+$)			
189.7 *2*	45.0 *8*	189.60	(5/2$^+$,7/2$^+$)	0.0	(5/2$^+$)	M1	0.0655	α(K)exp=0.063 *4* α(K)=0.0570 *9*; α(L)=0.00691 *10*; α(M)=0.001300 *19*; α(N)=0.000219 *4*; α(N+..)=0.000219 *4*
197.0 *4*	0.9 *3*	349.13	(3/2$^+$,5/2$^+$,7/2$^+$)	151.88	(3/2$^+$)			
217.0 *2*	9.1 *4*	252.18	(3/2$^+$,1/2$^+$)	35.08	(1/2$^+$)	M1,E2[‡]	0.068 *22*	α(K)exp=0.05 *3* α(K)=0.058 *18*; α(L)=0.008 *4*; α(M)=0.0016 *7*; α(N)=0.00025 *11*; α(N+..)=0.00025 *11*

$^{113}_{46}Pd_{67}$-2

^{113}Rh β^- decay 1993Pe11 (continued)

$\gamma(^{113}Pd)$ (continued)

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α	Comments
219.6 *3*	10.3 *6*	409.26	+	189.60	(5/2+,7/2+)			
221.0 *3*	4.3 *5*	372.97	(1/2+,3/2+,5/2+)	151.88	(3/2+)			
236.7 *4*	0.9 *3*	409.26	+	172.55	(1/2+)			
252.1 *3*	6.8 *5*	252.18	(3/2+,1/2+)	0.0	(5/2+)	E2,M1[‡]	0.042 *12*	α(K)exp=0.04 *3* α(K)=0.036 *9*; α(L)=0.0049 *17*; α(M)=0.0009 *4*; α(N)=0.00015 *5*; α(N+..)=0.00015 *5*
257.9 *4*	2.7 *4*	408.8		151.88	(3/2+)			
265.5 *3*	2.8 *4*	454.6		189.60	(5/2+,7/2+)			
310.8 *4*	1.2 *3*	500.34		189.60	(5/2+,7/2+)			
[x]332.7 *3*	2.0 *3*							
332.7 *3*	2.0 *3*	742.3		408.8				
339.1 *4*	<0.5	1081.2		742.3				
348.5 *6*	2.1 *5*	500.34		151.88	(3/2+)			I_γ: from $\gamma\gamma$.
348.9 *5*	100.0 *9*	349.13	(3/2+,5/2+,7/2+)	0.0	(5/2+)	M1,E2	0.0158 *23*	α(K)exp=0.0144 *20* α(K)=0.0136 *19*; α(L)=0.0017 *4*; α(M)=0.00033 *7*; α(N)=5.5×10^{-5} *11*; α(N+..)=5.5×10^{-5} *11* I_γ: from $\gamma\gamma$.
348.9 *5*	2.1 *5*	538.7		189.60	(5/2+,7/2+)			
357.6 *3*	4.5 *3*	730.6		372.97	(1/2+,3/2+,5/2+)			
373.1 *4*	1.8 *4*	372.97	(1/2+,3/2+,5/2+)	0.0	(5/2+)			
409.3 *3*	42.2 *8*	409.26	+	0.0	(5/2+)	E2[‡]	0.01090	α(K)exp=0.020 *6* α(K)=0.00940 *14*; α(L)=0.001233 *18*; α(M)=0.000232 *4*; α(N)=3.85×10^{-5} *6*; α(N+..)=3.85×10^{-5} *6*
454.7 *4*	2.8 *4*	454.6		0.0	(5/2+)			
500.3 *3*	5.5 *4*	500.34		0.0	(5/2+)			
538.8 *4*	7.0 *5*	538.7		0.0	(5/2+)			
[x]543.0 *4*	3.8 *4*							
609.0 *3*	6.8 *5*	861.2		252.18	(3/2+,1/2+)			
671.1 *4*	2.3 *5*	1081.2		408.8				
[x]749.1 *4*	1.7 *4*							
[x]932.7 *4*	3.8 *5*							
[x]980.0 *5*	2.0 *4*							
[x]1053.0 *5*	1.9 *4*							

[†] Simultaneous measurement of conversion electrons and gammas.
[‡] Electron and gamma intensities are deduced from single spectra taken in separated runs. Normalized to the 189.7 keV transition (M1).
[#] For absolute intensity per 100 decays, multiply by 0.272 *14*.
[x] γ ray not placed in level scheme.

$^{113}_{46}Pd_{67}$-3

^{113}Rh β^- decay 1993Pe11

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays