^{109}Pd β^- decay 2015Kr07

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. Kumar(a), J. Chen(b) and F. G. Kondev	NDS 137, 1 (2016)	31-May-2016

Parent: ^{109}Pd: E=0.0; $J^\pi=5/2^+$; $T_{1/2}$=13.59 h *12*; Q(β^-)=1113.3 *14*; %β^- decay=100.0

2015Kr07: ^{109}Pd source was produced in neutron irradiations at the Oregon State University TRIGA Reactor on a natural Pd target. γ rays were detected by Ge(Li) detectors. Measured Eγ, Iγ, $T_{1/2}$.

1968Be22: ^{109}Pd source were prepared by irradiating samples of metallic enriched ^{108}Pd (85-95%). γ rays were detected by Ge(Li) detectors (FWHM=2.0 keV at Eγ=662) and NaI(Tl) detectors. Measured Eγ, Iγ, $\gamma\gamma$-con. Deduced levels, γ-ray branching ratios.

1968Gr02: ^{109}Pd source were prepared by irradiating 4 mg samples of enriched metallic ^{108}Pd (94.2%) at the MIT reactor or at the Institute of Technology, Finland reactor. γ rays were detected by Ge(Li) detectors (FWHM=2.5 or 4 keV at Eγ=662) and a NaI(Tl) detector. Measured Eγ, Iγ, $\gamma\gamma$-coin. Deduced levels, γ-ray branching ratios.

1969Sc12: ^{109}Pd source were prepared by irradiating 4 mg samples of enriched metallic ^{108}Pd (94.2%) at the Ames Laboratory Research Reactor. γ rays were detected by Ge(Li) (FWHM=1.8 keV at Eγ=100 and 2.8 keV at Eγ=1000) and NaI(Tl) detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin. Deduced levels, γ-ray branching ratios.

1970Ba37: ^{109}Pd source were prepared by irradiating samples of metallic enriched ^{108}Pd (94%). γ rays were detected by a 2.5 cm^3 Ge(Li) detector (FWHM=2.0 keV at Eγ=661) and conversion electrons were detected by a high resolution iron-free double focusing beta-ray spectrometer. Measured Eγ, Iγ, E(ce), I(ce). Deduced levels, γ-ray transition multipolarities, γ-ray branching ratios, conversion coefficients.

1975El10: ^{109}Pd source were prepared by irradiating 4 mg samples of natural metallic ^{108}Pd at the are reactor. γ rays were detected by Ge(Li) and NaI(Tl)l detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma(\theta)$. Deduced levels, J^π, γ-ray branching ratios and mixing ratios.

1978Pr08: ^{109}Pd source were prepared by irradiating samples of metallic enriched ^{108}Pd (95%) at the Rez inr reactor. γ rays were detected by Ge(Li) coaxial detectors (FWHM=2.5 keV at Eγ=1333 and 1.8 keV at Eγ=662). Measured Eγ, Iγ, $\gamma\gamma$-coin. Deduced levels, γ-ray branching ratios.

1982Aw03: ^{109}Pd source were prepared by irradiating samples of metallic enriched ^{108}Pd (94%) at the Inchass reactor. γ rays were detected by Ge(Li) detectors (FWHM=2.7 keV at Eγ=1332.6 and 0.56 keV at Eγ=122). Measured Eγ, Iγ. Deduced levels, γ-ray branching ratios.

1988Br31: ^{109}Pd source were prepared by irradiating 225 mg samples of enriched ^{108}Pd (98.79%) in the Oregon State University triga reactor for a period of 2 hours. γ rays were detected by Ge detectors. Measured Eγ, Iγ, $\gamma\gamma(\theta)$, ce. Deduced levels, J^π, γ-ray multipolarities, branching ratios and mixing ratios.

Other measurements: 1953Av25, 1953Nu04, 1954Mo38, 1957Ma16, 1957Wa05, 1959St28, 1962Br15, 1962Ec02, 1967DiZZ, 1967Na18, 1968BaZY, 1970Be79, 1973ChZN, 1973ChWJ, 1973BuZX, 1976GaZQ, 1977ChYJ, 1977Bo04, 1978Sh08, 1982Br19, 1983BaZT, 1983Ch42, 1985Ed01.

^{109}Ag Levels

E(level)†	J^π‡	$T_{1/2}$‡	Comments
0.0	$1/2^-$	stable	
88.0338 *10*	$7/2^+$	39.79 s *21*	μ=+4.400 *6* (1985Ed01)
132.764 *8*	$9/2^+$	2.60 ns *12*	$T_{1/2}$: from delayed coincidence in 1972Ja01. Other: 1968BeZV.
311.381 *6*	$3/2^-$	5.9 ps *7*	
415.205 *7*	$5/2^-$	33.4 ps *13*	1973Co10 observed 327γ ($5/2^-$ to $7/2^+$) and 282 ($5/2^-$ to $9/2^+$) gammas through Coulomb excitation measurements. These gammas have branching ratios of 0.37% *9* and 0.05% *3*, respectively. See ^{109}Ag Coulomb excitation. The 327γ is also seen by 1983Ch42.
697.38? *14*			
701.879 *9*	$3/2^-$	0.27 ps *7*	
706.972 *10*	($3/2,5/2^-$)		
724.385 *6*	$3/2^+$	3.2 ns *8*	$T_{1/2}$: from delayed coincidence in 1982Br19.
735.322 *7*	$5/2^+$		
811.74? *19*			

Continued on next page (footnotes at end of table)

^{109}Pd β^- decay 2015Kr07 (continued)

^{109}Ag Levels (continued)

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$[‡]
862.638 *9*	5/2$^-$	1.39 ps *21*
869.429 *6*	5/2$^+$	
910.903 *11*	7/2$^+$	
912.217 *24*	7/2$^-$	
1099.11 *4*	(5/2,7/2$^-$)	

[†] From a least-squares fit to Eγ.
[‡] From Adopted Levels, unless otherwise stated.

β^- radiations

E(decay)	E(level)	Iβ^-[†‡]	Log *ft*	Comments
(14.2 *14*)	1099.11	0.000062 *5*	6.41 *14*	av Eβ=3.56 *36*
(202.4 *14*)	910.903	0.00132 *4*	8.609 *17*	av Eβ=55.82 *43*
(243.9 *14*)	869.429	0.0202 *6*	7.683 *16*	av Eβ=68.53 *44*
(250.7 *14*)	862.638	0.00189 *6*	8.750 *17*	av Eβ=70.65 *44*
(301.6 *14*)	811.74?	0.000112 *24*	10.24 *10*	av Eβ=86.84 *46*
(378.0 *14*)	735.322	0.0339 *10*	8.079 *15*	av Eβ=112.15 *48*
(388.9 *14*)	724.385	0.0215 *6*	8.318 *14*	av Eβ=115.87 *48*
(406.3 *14*)	706.972	0.00161 *5*	9.508 *15*	av Eβ=121.82 *49*
(411.4 *14*)	701.879	0.00458 *14*	9.072 *15*	av Eβ=123.58 *49*
(415.9 *14*)	697.38?	0.00005 *3*	11.0 *3*	av Eβ=125.13 *49*
(698.1 *14*)	415.205	0.00650 *23*	9.710 *17*	av Eβ=228.59 *54*
(801.9 *14*)	311.381	0.0208 *7*	9.421 *16*	av Eβ=269.18 *56*
(1025.3 *14*)	88.0338	100 *4*	6.130 *18*	av Eβ=359.87 *59*
				E(decay): 1028 keV 2 in 1962Br15. Other measurements: 1959St28, 1954Mo38.

[†] Deduced from I(γ+ce) intensity balances by assuming no β^- feeding g.s.
[‡] Absolute intensity per 100 decays.

^{109}Pd β^- decay 2015Kr07 (continued)

$\gamma(^{109}Ag)$

Iγ normalization: from Σ (I(γ+ce) to g.s.)=100 by assuming no β^- feeding to g.s.

E_γ[†]	I_γ[†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡@]	α[#]	Comments
44.77 *13*	4.7 *4*	132.764	$9/2^+$	88.0338	$7/2^+$	M1+E2	0.14 *6*	4.6 *5*	α(K)=3.85 *19*; α(L)=0.65 *20*; α(M)=0.126 *39* α(N)=0.0212 *60*; α(O)=0.000711 *22* E_γ: weighted average of 44.7 *2* (1968Be22), 44.8 *6* (1968Gr02), 44.8 *4* (1970Ba37), 44.0 *5* (1975El10) and 44.98 *21* (1982Aw03). Other: 45.8 *2* (1978Sh08). I_γ: weighted average of 5.5 *17* (1968Gr02), 4.8 *5* (1970Ba37) and 4.5 *6* (1982Aw03). Other: 4.5 (1968Be22). δ: From 1984ShZL. Mult.: α(K)exp=3.6 *5*, α(L)exp=0.7 *3* (1978Sh08).
88.0336 *10*	1.410×10^4 *30*	88.0338	$7/2^+$	0.0	$1/2^-$	E3		26.3	α(K)=11.41 *16*; α(L)=12.06 *17*; α(M)=2.47 *4* α(N)=0.386 *6*; α(O)=0.001398 *20* E_γ: From adopted gammas. Others in ^{109}Pd β^- decay: 88.022 *10* (2015Kr07), 88.04 *5* (1969Sc12), 88.04 *10* (1982Aw03), 88.06 *2* (1978Sh08), 88.1 *2* (1968Be22), 88.2 *5*(1968Gr02), 88.0 *4* (1970Ba37), 88.1 *5* (1975El10), and 88 *1* (1978Pr08). I_γ: Others: 1.37×10^4 *16* (1968Gr02), 1.48×10^4 *18* (1969Sc12), 1.17×10^4 *12* (1970Ba37), 1.43×10^4 *19* (1975El10), 1.46×10^4 *13* (1978Pr08) and 1.20×10^4 *8* (1982Aw03). Mult.: From adopted gammas. ce data in ^{109}Pd β^- decay: α(K)exp=10.6 *5* (1970Ba37);α(K)exp=11.6, K:L:M:N=(0.98 *5*):1:(0.20 *1*):(0.050 *5*), L1:L2:L3=(0.185 *15*):1:(1.163 *27*) (1978Sh08). Double K-shell vacancy per K-shell internal conversion: 13.0×10^{-5} 11 (1979Va04).
103.827 *23*	2.57 *12*	415.205	$5/2^-$	311.381	$3/2^-$	M1+E2	−0.039 *17*	0.379	α(K)=0.329 *5*; α(L)=0.0410 *7*; α(M)=0.00780 *13* α(N)=0.001348 *22*; α(O)=6.18×10^{-5} *9* E_γ: Others: 103.7 *2* (1968Be22), 103.6 *7* (1968Gr02), 103.9 *4* (1969Sc12), 103.6 *4* (1970Ba37), 103.5 *5* (1975El10), 103.6 *2* (1978Pr08) and 103.73 *25* (1982Aw03). I_γ: Others: 3.4 *11* (1968Gr02), 3.8 *12* (1969Sc12), 1.9 *2* (1970Ba37), 2.7 *6* (1975El10), 2.8 *5* (1978Pr08) and 2.7 *5* (1982Aw03). Mult.: α(K)exp=0.44 *5* (1970Ba37).
114.26[a] *19*	0.25 *8*	811.74?		697.38?					E_γ: Weighted average of 114.2 *3* (1975El10) and 114.30 *25* (1982Aw03). Seen only in 1975El10 and 1982Aw03. I_γ: from 1975El10. 2.8 *6* from 1982Aw03.

From ENSDF

$^{109}_{47}Ag_{62}$-3

$\gamma(^{109}Ag)$ (continued)

E_γ [†]	I_γ [†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	δ [‡@]	α [#]	Comments
134.107 *18*	5.92 *12*	869.429	$5/2^+$	735.322	$5/2^+$	M1+E2	0.44 *+13−15*	0.24 *3*	α(K)=0.201 *21*; α(L)=0.030 *6*; α(M)=0.0058 *11* α(N)=0.00097 *17*; α(O)=3.5×10^{-5} *3* E_γ: Others: 134.3 *2* (1968Be22), 134.7 *7* (1968Gr02), 134.2 *2* (1969Sc12), 134.5 *3* (1970Ba37), 134.4 *2* (1975El10), 134.0 *2* (1978Pr08) and 134.1 *2* (1982Aw03). I_γ: Others: 4.9 *15* (1968Gr02), 5.4 *18* (1969Sc12), 4.0 *4* (1970Ba37), 4.7 *7* (1975El10), 6.1 *9* (1978Pr08) and 5.7 *6* (1982Aw03). Mult.: α(K)exp=0.20 *2* (1970Ba37).
145.039 *14*	3.83 *7*	869.429	$5/2^+$	724.385	$3/2^+$	M1+E2	0.13 *2*	0.1531 *25*	α(K)=0.1326 *21*; α(L)=0.0167 *4*; α(M)=0.00318 *7* α(N)=0.000549 *11*; α(O)=2.48×10^{-5} *4* E_γ: Others: 145.4 *3* (1968Be22), 145.9 *7* (1968Gr02), 145.1 *2* (1969Sc12), 145.5 *3* (1970Ba37), 145.4 *2* (1975El10), 145.0 *2* (1978Pr08) and 145.20 *21* (1982Aw03). I_γ: Others: 4.2 *13* (1968Gr02), 4.6 *14* (1969Sc12), 3.1 *3* (1970Ba37), 3.5 *5* (1975El10), 3.8 *8* (1978Pr08) and 3.9 *5* (1982Aw03). δ: 0.13 *2* from $\gamma\gamma(\theta)$ in 1975El10. Mult.: α(K)exp=0.15 *2* (1970Ba37).
162.37 *4*	0.41 *4*	869.429	$5/2^+$	706.972	(3/2,5/2$^-$)				
282.441[a] *11*	≤0.022	415.205	$5/2^-$	132.764	$9/2^+$	[M2]		0.1163	α(K)=0.0994 *14*; α(L)=0.01378 *20*; α(M)=0.00266 *4* α(N)=0.000458 *7*; α(O)=2.04×10^{-5} *3* E_γ: From level energy differences. I_γ: From adopted gammas, relative to Iγ(415.222γ).
286.644 *24*	0.695 *48*	701.879	$3/2^-$	415.205	$5/2^-$	[M1]		0.0244	α(K)=0.0213 *3*; α(L)=0.00257 *4*; α(M)=0.000488 *7* α(N)=8.45×10^{-5} *12*; α(O)=3.97×10^{-6} *6* E_γ: Others: 286.3 *5* (1969Sc12), 286.0 *5* (1975El10), 286.8 *2* (1978Pr08) and 286.5 *3* (1982Aw03). I_γ: Others:0.6 *2* (1969Sc12), 0.8 *1* (1975El10) and 0.5 *1* (1978Pr08). 1.7 *5* from 1982Aw03.
309.182 *10*	16.3 *2*	724.385	$3/2^+$	415.205	$5/2^-$	E1(+M2)	+0.03 *6*	0.0068 *6*	α(K)=0.0060 *5*; α(L)=0.00071 *7*; α(M)=0.000133 *14* α(N)=2.29×10^{-5} *23*; α(O)=1.03×10^{-6} *11* E_γ: Others: 309.3 *5* (1968Be22), 309.1 *5* (1969Sc12), 309.1 *7* (1970Ba37), 109.0 *5* (1975El10), 309.3 *4* (1978Pr08) and 309.30 *15* (1982Aw03). I_γ: Others: 19 *8* (1969Sc12), 21.0 *9* (1970Ba37), 16.4 *16* (1975El10), 20 *6* (1978Pr08) and 20 *2* (1982Aw03). δ: $\gamma\gamma(\theta)$ in 1988Br31. Mult.: α(K)exp=0.006 *1* (1970Ba37).

From ENSDF

^{109}Pd β^- decay 2015Kr07 (continued)

$\gamma(^{109}Ag)$ (continued)

E_γ[†]	I_γ[†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡@]	α[#]	Comments
311.390 *10*	130 *1*	311.381	3/2$^-$	0.0	1/2$^-$	M1+E2	−0.192 *7*	0.0200	α(K)=0.01743 *25*; α(L)=0.00212 *3*; α(M)=0.000402 *6* α(N)=6.96×10^{-5} *10*; α(O)=3.24×10^{-6} *5* E_γ: Others: 311.3 *1* (1968Be22), 311.5 *5* (1968Gr02), 311.4 *1* (1969Sc12), 311.4 *2* (1970Ba37), 311.0 *2* (1975El10), 311.4 *1* (1978Pr08) and 311.4 *1* (1982Aw03). I_γ: Others: 154 *12* (1968Gr02), 91 *8* (1970Ba37), 123 *12* (1975El10), 124 *6* (1978Pr08) and 121 *9* (1982Aw03). Mult.: α(K)exp=0.019 *2* (1970Ba37). δ: Other: 0.35 5 from $\gamma\gamma(\theta)$ in 1975El10.
327.171[a] *7*	0.18 *4*	415.205	5/2$^-$	88.0338	7/2$^+$	[E1]		0.00582	α(K)=0.00509 *8*; α(L)=0.000599 *9*; α(M)=0.0001133 *16* α(N)=1.95×10^{-5} *3*; α(O)=8.81×10^{-7} *13* E_γ: From level energy differences. I_γ: From adopted gammas, relative to Iγ(415.222γ).
390.515 *18*	3.51 *14*	701.879	3/2$^-$	311.381	3/2$^-$	M1+E2	+0.21 *4*	0.01126 *17*	α(K)=0.00981 *14*; α(L)=0.001180 *18*; α(M)=0.000224 *4* α(N)=3.88×10^{-5} *6*; α(O)=1.82×10^{-6} *3* E_γ: Others: 390.5 *3* (1968Be22), 390.9 *8* (1968Gr02), 390.6 *2* (1969Sc12), 390.7 *5* (1970Ba37), 391.0 *3* (1975El10), 390.6 *2* (1978Pr08) and 390.4 *2* (1982Aw03). I_γ: Others: 3.9 *8* (1968Gr02), 3.8 *12* (1969Sc12), 3.2 *3* (1970Ba37), 3.9 *6* (1975El10), 3.6 *3* (1978Pr08). 8.1 *11* from 1982Aw03. δ: 0.19 *6* from $\gamma\gamma(\theta)$ in 1977Bo04, +0.23 *5* from $\gamma\gamma(\theta)$ in 1988Br31. Mult.: α(K)exp=0.095 *2* (1970Ba37).
395.590 *28*	0.282 *24*	706.972	(3/2,5/2$^-$)	311.381	3/2$^-$				E_γ: Others: 395.6 *5* (1969Sc12), 395.6 *3* (1975El10), 395.8 *9* (1978Pr08) and 396.3 *3* (1982Aw03). I_γ: Others: 0.27 *13* (1969Sc12), 0.7 *3* (1975El10), 0.27 *5* (1978Pr08) and 0.50 *5* (1982Aw03).
402.05[a] *9*	0.25 *9*	1099.11	(5/2,7/2$^-$)	697.38?					E_γ: weighted average of 402.2 *5* (1975El10) and 402.0 *3* (1982Aw03). Seen only in 1975El10 and 1982Aw03. I_γ: from 1975El10. 1.9 *5* from 1982Aw03.
413.010 *10*	27.6 *3*	724.385	3/2$^+$	311.381	3/2$^-$	E1+M2	0.18 *5*	0.0042 *6*	α(K)=0.0037 *6*; α(L)=0.00044 *7*; α(M)=8.4×10^{-5} *14* α(N)=1.45×10^{-5} *23*; α(O)=6.6×10^{-7} *11* E_γ: Others: 413.0 *1* (1968Be22), 413.5 *10* (1968Gr02), 413.0 *4* (1969Sc12), 413.2 *2* (1970Ba37), 413.0 *1* (1975El10), 413.0 *1* (1978Pr08) and 413.05 *10* (1982Aw03). I_γ: Others: 40 *12* (1968Gr02), 27 *8* (1969Sc12), 23 *2* (1970Ba37), 29 *3* (1975El10), 29 *2* (1978Pr08) and 24 *3* (1982Aw03). δ: from $\gamma\gamma(\theta)$ in 1977Bo04. Mult.: α(K)exp=0.0030 *3* (1970Ba37).

From ENSDF

$^{109}_{47}Ag_{62}$-5

^{109}Pd β^- decay 2015Kr07 (continued)

$\gamma(^{109}Ag)$ (continued)

E_γ[†]	I_γ[†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡@]	α[#]	Comments
415.222 *10*	43.9 *5*	415.205	5/2$^-$	0.0	1/2$^-$	E2		0.01098	α(K)=0.00944 *14*; α(L)=0.001257 *18*; α(M)=0.000240 *4* α(N)=4.08×10^{-5} *6*; α(O)=1.636×10^{-6} *23* E_γ: Others: 415.0 *1* (1968Be22), 415.2 *6* (1968Gr02), 415.2 *3* (1969Sc12), 415.1 *2* (1970Ba37), 415.2 *1* (1975El10), 415.19 *7* (1978Pr08) and 415.3 *1* (1982Aw03). I_γ: Others: 35 *11* (1968Gr02), 43 *12* (1969Sc12), 45 *4* (1970Ba37), 43 *4* (1975El10), 42 *3* (1978Pr08) and 48 *6* (1982Aw03). Mult.: α(K)exp=0.010 *1* (1970Ba37).
423.942 *12*	3.83 *6*	735.322	5/2$^+$	311.381	3/2$^-$	E1(+M2)	+0.08 *8*	0.0032 *6*	α(K)=0.0028 *5*; α(L)=0.00033 *7*; α(M)=6.2×10^{-5} *12* α(N)=1.07×10^{-5} *21*; α(O)=4.9×10^{-7} *10* E_γ: Others: 423.9 *3* (1968Be22), 424.7 *8* (1968Gr02), 423.9 *2* (1969Sc12), 424.0 *4* (1970Ba37), 424.1 *3* (1975El10), 424.0 *2* (1978Pr08) and 424.0 *2* (1982Aw03). I_γ: Others: 2.8 *7* (1968Gr02), 3.8 *12* (1969Sc12), 3.9 *3* (1970Ba37), 3.8 *5* (1975El10), 3.5 *3* (1978Pr08) and 3.4 *5* (1982Aw03). Mult.: α(K)exp=0.0030 *5* (1970Ba37). δ: from $\gamma\gamma(\theta)$ in 1988Br31; Other: −0.27 *3* from $\gamma\gamma(\theta)$ in 1977Bo04.
447.426 *14*	3.74 *6*	862.638	5/2$^-$	415.205	5/2$^-$	M1+E2	−0.16 *4*	0.00801	α(K)=0.00699 *10*; α(L)=0.000834 *12*; α(M)=0.0001582 *23* α(N)=2.74×10^{-5} *4*; α(O)=1.295×10^{-6} *19* E_γ: Others: 447.5 *2* (1968Be22), 448.2 *8* (1968Gr02), 447.6 *2* (1969Sc12), 447.4 *3* (1970Ba37), 447.8 *3* (1975El10), 447.5 *2* (1978Pr08) and 447.02 *20* (1982Aw03). I_γ: Others: 4 *1* (1968Gr02), 3.3 *12* (1969Sc12), 3.3 *3* (1970Ba37), 3.0 *5* (1975El10), 3.5 *3* (1978Pr08) and 3.0 *5* (1982Aw03). δ: −0.12 *14* from $\gamma\gamma(\theta)$ in 1988Br31. Mult.: α(K)exp=0.0070 *8* (1970Ba37).
454.269 *14*	1.71 *6*	869.429	5/2$^+$	415.205	5/2$^-$	E1(+M2)	−0.14 *+36−17*	0.0030 *17*	α(K)=0.0026 *15*; α(L)=3.1×10^{-4} *19*; α(M)=5.9×10^{-5} *36* α(N)=1.02×10^{-5} *62*; α(O)=4.7×10^{-7} *29* E_γ: Others: 454.3 *2* (1968Be22), 454.3 *3* (1969Sc12), 454.1 *3* (1970Ba37), 454.0 *3* (1975El10), 454.2 *2* (1978Pr08) and 454.40 *25* (1982Aw03). I_γ: Others: 2.2 *11* (1969Sc12), 2.3 *2* (1970Ba37), 2.2 *4* (1975El10), 1.7 *2* (1978Pr08) and 2.2 *5* (1982Aw03). δ: −0.14 *+36−17* from $\gamma\gamma(\theta)$ in 1988Br31.
497.010 *23*	0.319 *23*	912.217	7/2$^-$	415.205	5/2$^-$	(M1+E2)		0.00619	α(K)=0.00540 *8*; α(L)=0.000641 *9*; α(M)=0.0001215 *17* α(N)=2.11×10^{-5} *3*; α(O)=1.001×10^{-6} *14* E_γ: Others: 496.9 *5* (1968Be22), 496.7 *7* (1970Ba37), and 496.9 *6* (1978Pr08). I_γ: Others: 0.15 *3* (1970Ba37) and 0.31 *6* (1978Pr08).

From ENSDF

$^{109}_{47}Ag_{62}$-6

^{109}Pd β^- decay 2015Kr07 (continued)

$\gamma(^{109}Ag)$ (continued)

E_γ[†]	I_γ[†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡@]	α[#]	Comments
500.6[a] *3*	0.18 *4*	811.74?		311.381	3/2$^-$				E_γ: Weighted average of 500.6 *5* (1975El10) and 500.6 *3* (1982Aw03). Seen only in 1975El10 and 1982Aw03. I_γ: from 1975El10. 1.2 *3* from 1982Aw03.
551.258 *14*	2.82 *4*	862.638	5/2$^-$	311.381	3/2$^-$	M1+E2	−0.28 *3*	0.00482	α(K)=0.00421 *6*; α(L)=0.000500 *7*; α(M)=9.49×10^{-5} *14* α(N)=1.645×10^{-5} *23*; α(O)=7.76×10^{-7} *11* E_γ: Others: 551.3 *2* (1968Be22), 551.3 *8* (1968Gr02), 551.4 *4* (1969Sc12), 551.2 *3* (1970Ba37), 551.2 *5* (1975El10), 551.2 *1* (1978Pr08) and 551.2 *2* (1982Aw03). I_γ: Others: 2.3 *8* (1968Gr02), 2.5 *9* (1969Sc12), 2.5 *3* (1970Ba37), 2.6 *5* (1975El10), 2.7 *2* (1978Pr08) and 3.1 *3* (1982Aw03). δ: −0.28 *4* from $\gamma\gamma(\theta)$ in 1977Bo04, −0.26 *7* from $\gamma\gamma(\theta)$ in 1988Br31.
558.040 *10*	10.4 *1*	869.429	5/2$^+$	311.381	3/2$^-$	E1+M2	−0.20 *4*	0.00205 *21*	α(K)=0.00179 *18*; α(L)=0.000214 *23*; α(M)=4.0×10^{-5} *5* α(N)=7.0×10^{-6} *8*; α(O)=3.2×10^{-7} *4* E_γ: Others: 558.1 *1* (1968Be22), 557.8 *5* (1968Gr02), 558.1 *2* (1969Sc12), 558.5 *2* (1970Ba37), 558.0 *3* (1975El10), 558.05 *7* (1978Pr08) and 558.10 *15* (1982Aw03). I_γ: Others: 9.5 *14* (1968Gr02), 10 *3* (1969Sc12), 9.6 *9* (1970Ba37), 10.7 *16* (1975El10), 9.9 *7* (1978Pr08) and 11.0 *7* (1982Aw03). δ: −0.26 *5* from $\gamma\gamma(\theta)$ in 1977Bo04, −0.026 *23* from $\gamma\gamma(\theta)$ in 1988Br31. Mult.: α(K)exp=0.0012 *3* (1970Ba37).
564.3[a] *3*	0.44 *7*	697.38?		132.764	9/2$^+$				E_γ: Weighted average of 564.4 *5* (1975El10) and 564.2 *3* (1982Aw03). Seen only in 1975El10 and 1982Aw03. I_γ: weighted average of 0.43 *7* (1975El10) and 0.8 *5* (1982Aw03).
601.1 *7*	0.06 *2*	912.217	7/2$^-$	311.381	3/2$^-$	(E2)		0.00377	α(K)=0.00327 *5*; α(L)=0.000410 *6*; α(M)=7.80×10^{-5} *12* α(N)=1.338×10^{-5} *20*; α(O)=5.79×10^{-7} *9* E_γ,I_γ: From adopted gammas. Iγ relative to Iγ(496γ).
602.568 *10*	33.6 *3*	735.322	5/2$^+$	132.764	9/2$^+$	E2		0.00374	α(K)=0.00324 *5*; α(L)=0.000407 *6*; α(M)=7.75×10^{-5} *11* α(N)=1.329×10^{-5} *19*; α(O)=5.75×10^{-7} *8* E_γ: Others: 602.5 *1* (1968Be22), 602.4 *5* (1968Gr02), 602.5 *1* (1969Sc12), 602.4 *2* (1970Ba37), 602.3 *5* (1975El10), 602.49 *9* (1978Pr08) and 602.6 *1* (1982Aw03). I_γ: Others: 33 *4* (1968Gr02), 33 *8* (1969Sc12), 34 *3* (1970Ba37), 35 *4* (1975El10), 35 *2* (1978Pr08) and 31 *3* (1982Aw03). Mult.: α(K)exp=0.0030 *5* (1970Ba37).
609.37[a] *17*	0.015 *15*	697.38?		88.0338	7/2$^+$				E_γ: Weighted average of 609.2 *4* (1975El10), 609.40 *21* (1982Aw03) and 609.5 *5* (1969Sc12). It is not placed in 1969Sc12 and evaluators have assigned it to this level. I_γ: Others: 0.7 *5* (1975El10) and 0.6 *3* (1969Sc12).
636.342 *10*	42.5 *4*	724.385	3/2$^+$	88.0338	7/2$^+$	E2		0.00323	α(K)=0.00281 *4*; α(L)=0.000350 *5*; α(M)=6.65×10^{-5} *10*

From ENSDF

$^{109}_{47}Ag_{62}$-7

^{109}Pd β^- decay 2015Kr07 (continued)

$\gamma(^{109}Ag)$ (continued)

E_γ[†]	I_γ[†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡@]	α[#]	Comments
									α(N)=1.142×10^{-5} *16*; α(O)=4.98×10^{-7} *7* E_γ: Others: 636.4 *2* (1968Be22), 636.1 *5* (1968Gr02), 636.3 *1* (1969Sc12), 636.3 *3* (1970Ba37), 636.5 *4* (1975El10), 636.25 *9* (1978Pr08) and 636.3 *1* (1982Aw03). I_γ: Others: 42 *6* (1968Gr02), 41 *10* (1969Sc12), 41 *4* (1970Ba37), 40 *4* (1975El10), 42 *3* (1978Pr08) and 42.6 *21* (1982Aw03). Mult.: α(K)exp=0.0026 *5* (1970Ba37).
647.272 *10*	100	735.322	5/2$^+$	88.0338	7/2$^+$	M1		0.00330	α(K)=0.00288 *4*; α(L)=0.000339 *5*; α(M)=6.43×10^{-5} *9* α(N)=1.117×10^{-5} *16*; α(O)=5.33×10^{-7} *8* E_γ: Others: 647.3 *1* (1968Be22), 647.3 *6* (1968Gr02), 647.3 *1* (1969Sc12), 647.3 *2* (1970Ba37), 647.21 *7* (1978Pr08) and 647.3 *1* (1982Aw03). 646.4 *1* from 1975El10. Mult.: α(K)exp=0.0027 *4* (1970Ba37).
701.876 *10*	13.3 *1*	701.879	3/2$^-$	0.0	1/2$^-$	M1+E2	0.029 *7*	0.00273	α(K)=0.00239 *4*; α(L)=0.000280 *4*; α(M)=5.32×10^{-5} *8* α(N)=9.23×10^{-6} *13*; α(O)=4.41×10^{-7} *7* E_γ: Others: 702.0 *2* (1968Be22), 701.8 *8* (1968Gr02), 701.9 *2* (1969Sc12), 702.0 *3* (1970Ba37), 701.9 *3* (1975El10), 701.8 *1* (1978Pr08) and 701.80 *15* (1982Aw03). I_γ: Others: 14.2 *19* (1968Gr02), 13 *3* (1969Sc12), 14.7 *12* (1970Ba37), 13.8 *14* (1975El10), 13.5 *18* (1978Pr08) and 14.2 *12* (1982Aw03). Mult.: α(K)exp=0.0023 *5* (1970Ba37).
706.964 *10*	6.33 *6*	706.972	(3/2,5/2$^-$)	0.0	1/2$^-$				E_γ: Others: 706.9 *3* (1968Be22), 707.0 *2* (1969Sc12), 707.1 *4* (1970Ba37), 707.1 *2* (1975El10), 706.9 *1* (1978Pr08) and 707.7 *2* (1982Aw03). I_γ: Others: 6.5 *18* (1969Sc12), 7.1 *7* (1970Ba37), 7.1 *10* (1975El10), 6.3 *9* (1978Pr08) and 5.3 *6* (1982Aw03). α(K)exp=0.0020 *6* (1970Ba37).
724.372 *14*	0.24 *3*	724.385	3/2$^+$	0.0	1/2$^-$				E_γ: Others: 724.6 *3* (1968Be22), 724.4 *3* (1969Sc12), 724.4 *5* (1970Ba37), 724.6 *2* (1975El10), 724.1 *3* (1978Pr08) and 724.4 *3* (1982Aw03). I_γ: Others: 0.8 *3* (1969Sc12), 1.1 *1* (1970Ba37), 1.0 *3* (1975El10), 0.4 *4* (1978Pr08) and 1.1 *3* (1982Aw03).
736.652 *10*	6.77 *7*	869.429	5/2$^+$	132.764	9/2$^+$	E2		0.00222	α(K)=0.00193 *3*; α(L)=0.000236 *4*; α(M)=4.48×10^{-5} *7* α(N)=7.72×10^{-6} *11*; α(O)=3.44×10^{-7} *5* E_γ: Others: 736.7 *2* (1968Be22), 736.7 *7* (1968Gr02), 736.7 *2* (1969Sc12), 736.8 *4* (1970Ba37), 736.7 *2* (1975El10), 736.6 *1* (1978Pr08) and 736.50 *25* (1982Aw03). I_γ: Others: 7.7 *11* (1968Gr02), 6.9 *19* (1969Sc12), 7.7 *7* (1970Ba37), 7.5 *12* (1975El10), 6.8 *9* (1978Pr08) and 7.5 *6* (1982Aw03). Mult.: α(K)exp=0.0018 *5* (1970Ba37).
778.140 *14*	4.29 *5*	910.903	7/2$^+$	132.764	9/2$^+$	M1		0.00215	α(K)=0.00188 *3*; α(L)=0.000221 *3*; α(M)=4.18×10^{-5} *6*

From ENSDF

$^{109}_{47}Ag_{62}$-8

^{109}Pd β^- decay 2015Kr07 (continued)

$\gamma(^{109}Ag)$ (continued)

E_γ [†]	I_γ [†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	α [#]	Comments
								α(N)=7.26×10^{-6} *11*; α(O)=3.47×10^{-7} *5* E_γ: Others: 778.3 *5* (1968Be22), 778.3 *5* (1969Sc12), 778.4 *7* (1970Ba37), 778.2 *2* (1975El10), 778.2 *3* (1978Pr08), 778.3 *5* (1982Aw03) and 778.3 *5* (1988Br31). I_γ: Others: 6.2 *25* (1969Sc12), 4.0 *4* (1970Ba37), 5.8 *9* (1975El10), 7.3 *25* (1978Pr08) and 4.0 *5* (1982Aw03). Mult.: α(K)exp=0.0018 *5* (1970Ba37).
781.394 *10*	46.6 *5*	869.429	5/2$^+$	88.0338	7/2$^+$	M1+E2	0.00213	α(K)=0.00187 *3*; α(L)=0.000219 *3*; α(M)=4.14×10^{-5} *6* α(N)=7.19×10^{-6} *10*; α(O)=3.44×10^{-7} *5* E_γ: Others: 781.4 *2* (1968Be22), 781.8 *7* (1968Gr02), 781.4 *2* (1969Sc12), 781.5 *3* (1970Ba37), 782.1 *4* (1975El10), 781.3 *1* (1978Pr08) and 781.4 *1* (1982Aw03). I_γ: Others: 51 *6* (1968Gr02), 45 *12* (1969Sc12), 50 *4* (1970Ba37), 49 *7* (1975El10), 48 *3* (1978Pr08) and 43 *3* (1982Aw03). Mult.: α(K)exp=0.0017 *5* (1970Ba37).
787.6[a] *3*	0.8 *5*	1099.11	(5/2,7/2$^-$)	311.381	3/2$^-$			E_γ,I_γ: from 1982Aw03. 1975El10 give Eγ=790.2 *5* with Iγ=0.09 *1*.
822.862 *14*	0.759 *8*	910.903	7/2$^+$	88.0338	7/2$^+$	[M1]	0.00190	α(K)=0.001660 *24*; α(L)=0.000194 *3*; α(M)=3.67×10^{-5} *6* α(N)=6.38×10^{-6} *9*; α(O)=3.06×10^{-7} *5* E_γ: Others: 822.9 *3* (1968Be22), 822.9 *4* (1969Sc12), 822.7 *5* (1970Ba37), 823.1 *2* (1975El10), 822.8 *2* (1978Pr08) and 822.9 *3* (1982Aw03). I_γ: Others: 0.77 *22* (1969Sc12), 0.5 *1* (1970Ba37), 0.77 *11* (1978Pr08) and 0.8 *5* (1982Aw03). 1.5 *4* from 1975El10.
862.637 *14*	0.682 *8*	862.638	5/2$^-$	0.0	1/2$^-$	E2	1.51×10^{-3}	α(K)=0.001313 *19*; α(L)=0.0001584 *23*; α(M)=3.00×10^{-5} *5* α(N)=5.18×10^{-6} *8*; α(O)=2.36×10^{-7} *4* E_γ: Others:862.8 *5* (1968Be22), 862.5 *4* (1969Sc12), 863.0 *7* (1970Ba37), 862.9 *1* (1975El10), 862.5 *3* (1978Pr08) and 862.6 *3* (1982Aw03). I_γ: Others: 0.54 *18* (1969Sc12), 0.3 *1* (1970Ba37), 0.5 *2* (1975El10), 0.66 *11* (1978Pr08) and 0.44 *5* (1982Aw03).
869.415 *25*	0.06 *3*	869.429	5/2$^+$	0.0	1/2$^-$	[M2]	0.00427	α(K)=0.00372 *6*; α(L)=0.000453 *7*; α(M)=8.62×10^{-5} *12* α(N)=1.495×10^{-5} *21*; α(O)=7.06×10^{-7} *10* E_γ: Other: 868.8 *10* (1969Sc12). I_γ: Other: 0.15 *8* (1969Sc12).
966.29 *4*	0.145 *7*	1099.11	(5/2,7/2$^-$)	132.764	9/2$^+$			E_γ: Others: 966.3 *5* (1968Be22), 966.4 *7* (1970Ba37), 966.2 *3* (1975El10), 966.2 *5* (1978Pr08) and 966.1 *3* (1982Aw03). I_γ: Others: 0.37 *13* (1975El10), 0.25 *4* (1978Pr08) and 0.43 *5* (1982Aw03).
1011.16 *5*	0.092 *5*	1099.11	(5/2,7/2$^-$)	88.0338	7/2$^+$			E_γ: Others: 1010.5 *5* (1968Be22), 1010.6 *9* (1970Ba37), 1010.0 *3* (1975El10), 1010.8 *6* (1978Pr08) and 1010.5 *3* (1982Aw03). I_γ: Others: 0.25 *8* (1975El10), 0.11 *4* (1978Pr08) and 0.38 *4* (1982Aw03).

From ENSDF

$^{109}_{47}Ag_{62}$-9

^{109}Pd β^- decay 2015Kr07 (continued)

$\gamma(^{109}Ag)$ (continued)

† From 2015Kr07, unless otherwise stated Iγ values are normalized to Iγ(647.27)=100.
‡ From Adopted Gammas, unless otherwise stated.
# Additional information 1.
@ If No value given it was assumed δ=0.00 for E2/M1, δ=1.00 for E3/M2 and δ=0.10 for the other multipolarities.
& For absolute intensity per 100 decays, multiply by 0.000260 *7*.
[a] Placement of transition in the level scheme is uncertain.

From ENSDF

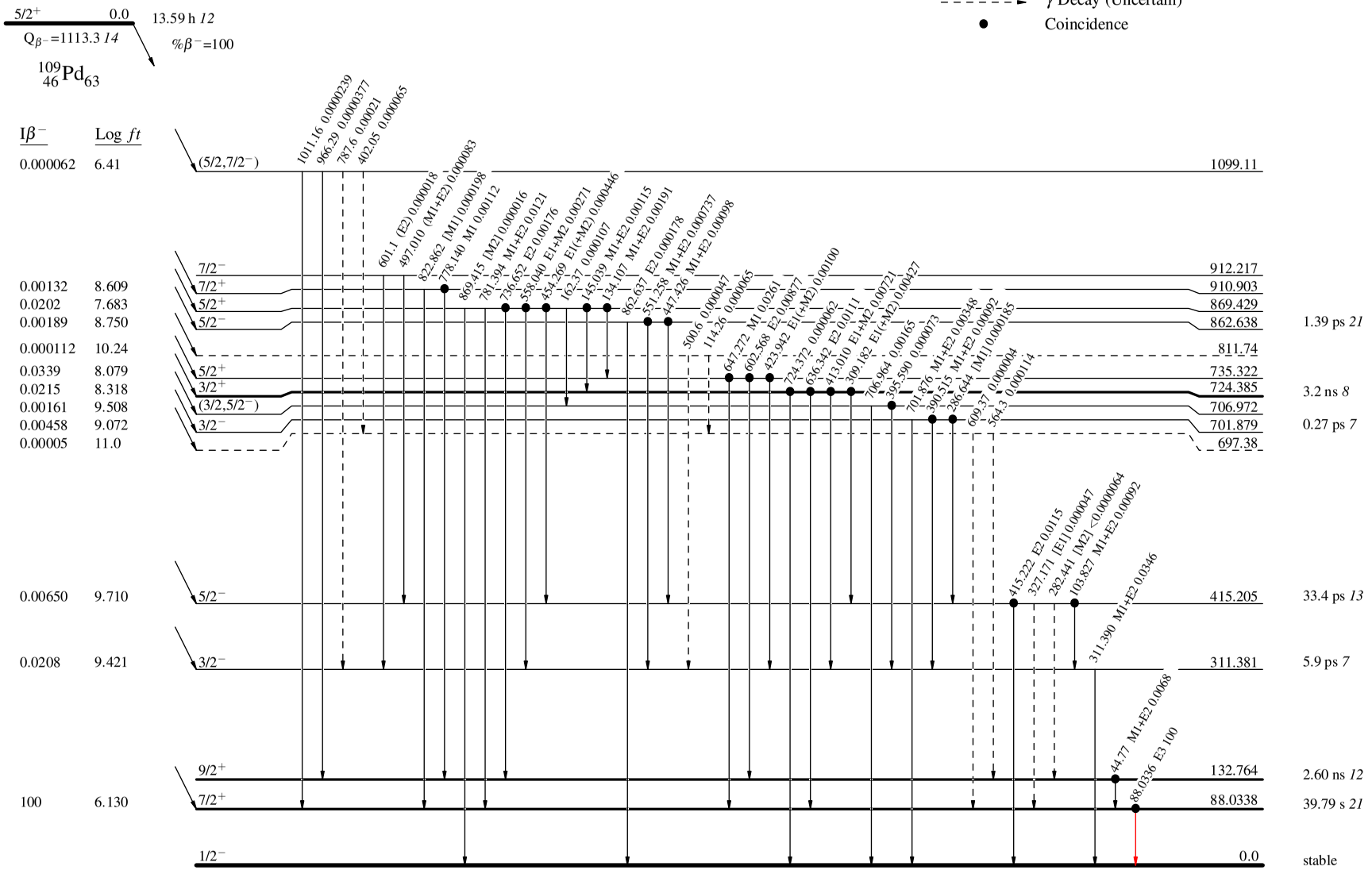
$^{109}_{47}Ag_{62}$-10

^{109}Pd β^- decay 2015Kr07

Decay Scheme

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

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)
- Coincidence



$^{109}_{47}Ag_{62}$

From ENSDF

$^{109}_{47}Ag_{62}$-11