

^{106}Rh β^- decay (30.07 s) [1982Ka10](#),[1977Ok02](#),[1977Ok03](#)

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

Parent: ^{106}Rh : E=0.0; $J^\pi=1^+$; $T_{1/2}=30.07$ s 35; $Q(\beta^-)=3541$ 6; % β^- decay=100.0

[1982Ka10](#): activity from β^- decay of ^{106}Ru . Measured: E_γ , I_γ , $\gamma\gamma$, $\gamma\gamma(\theta)$. Deduced: levels, J^π , δ .

[1977Ok02](#),[1977Ok03](#): activity from β^- decay of ^{106}Ru . Measured: E_γ , I_γ , Ice, $\gamma\gamma$, $\gamma\gamma(\theta)$. Deduced: ^{106}Pd levels, log ft, J^π , mult, δ , $\rho(E0)$.

 ^{106}Pd Levels

E(level) [†]	J^π [‡]	$T_{1/2}$	Comments
0.0	0 ⁺	stable	
511.862 3	2 ⁺		g=0.369 13 g: From $\gamma\gamma(\theta,H)$. Weighted average of 0.384 33 (1968Jo17), 0.349 27 (1968Bo15), 0.369 29 (1970Si20), 0.382 28 (1972Jo06) Others: 1965Ko12 , 1966Au06 , 1967Mu09 .
1128.04 4	2 ⁺		g=0.290 47 From (873 γ)(1128 γ)(θ,H): g-factor is weighted average of 0.307 92 (1970Si20), 0.285 54 (1968Bo15);
1133.75 5	0 ⁺		B(E0,1134 γ)/B(E2,622 γ)=0.0181 14 (1980Oh02).
1228.97 13	4 ⁺		
1557.19 11	3 ⁺		
1562.26 4	2 ⁺		
1706.41 5	0 ⁺		
1909.47 20	(1 ⁺ ,2 ⁺)		
2001.53 6	0 ⁺		
2242.48 5	2 ⁺		
2278.14 5	0 ⁺		
2308.77 6	2 ⁺		
2439.07 7	2 ⁺		
2484.66 20	(1 ⁻)		
2500.30 8	2 ⁻		
2624.41 5	0 ⁺		
2705.30 8	(1) ⁺		
2717.10 23			
2783.79 20	2 ⁺		
2820.98 8	2 ⁺		
2828.29 9	0 ⁺		
2877.93 7	0 ⁺		
2902.49 10	2 ⁺		
2917.84 8	2 ⁺		
2968.69 20	3 ⁻		
3037.34 17	1,2		
3054.88 9	1 ⁺		
3083.40 15	0		
3163.3 3	(1,2 ⁺)		J^π : if level is identical with adopted 3161.0 level then J=0 for that level proposed from (2651 γ)(512 γ)(θ) in ^{106}Rh β^- decay is in conflict with adopted $J^\pi=(1,2^+)$.
3221.39 24	0 ⁺		
3249.9 5	2 ⁺		
3252.0 4	2 ⁺		
3273.5 7	1,2		
3299.2 7			
3320.5 3	0 ⁺		
3376.6? 9			E(level): Observed only by 1977Ok02 .
3401.9? 6			E(level): Observed only by 1977Ok02 .

Continued on next page (footnotes at end of table)

¹⁰⁶Rh β⁻ decay (30.07 s) 1982Ka10,1977Ok02,1977Ok03 (continued)

¹⁰⁶Pd Levels (continued)

† Calculated with least squares procedure with gammas of 1982Ka10.

‡ From Adopted Levels.

β⁻ radiations

E(decay)	E(level)	Iβ ⁻ ‡	Log ft	Comments
(221 6)	3320.5	0.00095 8	5.63 7	av Eβ= 61 3
(289 6)	3252.0	0.00025 5	6.59 10	av Eβ= 83 3
(320 6)	3221.39	0.0042 2	5.51 5	av Eβ= 93 3
(378 6)	3163.3	0.00066 9	6.55 7	av Eβ= 112 3
(458 6)	3083.40	0.0029 2	6.19 5	av Eβ= 140 4
(486 6)	3054.88	0.0102 3	5.73 3	av Eβ= 150 4
(504 6)	3037.34	0.0027 2	6.36 5	av Eβ= 156 4
(572 6)	2968.69	0.00029 1	7.52 3	av Eβ= 181 4
(623 6)	2917.84	0.0190 8	5.83 3	av Eβ= 200 4
(639 6)	2902.49	0.0080 4	6.25 3	av Eβ= 206 4
(663 6)	2877.93	0.0271 11	5.77 3	av Eβ= 215 4
(713 6)	2828.29	0.0075 3	6.44 3	av Eβ= 234 4
(720 6)	2820.98	0.0087 4	6.39 3	av Eβ= 237 4
(757 6)	2783.79	0.0014 1	7.27 4	av Eβ= 252 4
(836 6)	2705.30	0.0088 4	6.62 3	av Eβ= 283 4
(917 6)	2624.41	0.090 4	5.760 25	av Eβ= 315 4
(1041 6)	2500.30	0.0292 10	6.453 21	av Eβ= 367 4
(1056 6)	2484.66	0.0011 2	7.90 8	av Eβ= 373 4
(1102 6)	2439.07	0.022 8	6.67 16	av Eβ= 392 4
(1232 6)	2308.77	0.044 2	6.552 24	av Eβ= 448 4
(1263 6)	2278.14	0.048 2	6.555 22	av Eβ= 461 4
(1299 6)	2242.48	0.0391 23	6.69 3	av Eβ= 476 4
(1539 6)	2001.53	0.460 15	5.907 18	av Eβ= 582 4
(1632 6)	1909.47	0.0027 3	8.24 5	av Eβ= 623 4
(1835 6)	1706.41	0.0667 22	7.049 17	av Eβ= 714 4
2000 40	1562.26	1.77 6	5.757 17	av Eβ= 779 5
				E(decay): 2000 100 (1952Al06), 2000 (1962Am03) β, β(1050γ). Iβ ⁻ : measurements: 3% 1 (1952Al06), 2% (1962Am03).
2410 30	1133.75	10.0 4	5.354 19	av Eβ= 976 5
				E(decay): 2410 30 av: 2440 70 (1952Al06), 2390 (1962Am03), 2410 (1966JoZZ). Iβ ⁻ : measurements: 12% 3 (1952Al06), 9% (1958Gr07), 17% (1962Am03), 4% (1966JoZZ).
(2413 6)	1128.04	0.64 9	6.55 7	av Eβ= 979 5
3050 20	511.862	8.1 3	5.865 17	av Eβ= 1267 5
				E(decay): 3050 20 (1960Se05), 3050 (1962Am03), 3040 (1966JoZZ). Iβ ⁻ : measurements: 11% 3 (1952Al06), 12% (1960Se05,1962Am03), 6% (1958Gr07,1966JoZZ).
3540 10	0.0	78.6 7	5.168 7	av Eβ= 1508 5
				E(decay): 3540 10 av: 3530 10 (1952Al06), 3550 10 (1958Gr07); others: 3550 20 (1960Se05), 3550 (1966JoZZ,1962Am03,1947Pe07). Iβ ⁻ : measurements: 68% 10 (1952Al06), 83% (1958Gr07), 70% (1960Se05), 67% (1962Am03), 90% (1966JoZZ).

† Derived from absolute I_γ determinations and level I(γ+ce) imbalances.

‡ Absolute intensity per 100 decays.

γ(¹⁰⁶Pd)

I_γ normalization: based on absolute I_γ(512γ)=20.6% 6 and I_γ(616+622γ)=10.6% 3 from I_γ/summed β⁻ (1969Od01) corrected for β-component from 371.6-d ¹⁰⁶Ru precursor.

For A₂,A₄ values, see 1977Ok03, 1982Ka10.

α(K)_{exp}=ce(K)/I_γ normalized to α(K)(512γ)=0.00484 7 (E2 BRICC theory).

1978Be59 studied properties of E0 (0⁺ to 0⁺) transitions of ¹⁰⁶Pd.

<u>E_γ[†]</u>	<u>I_γ^{†@}</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.[‡]</u>	<u>δ[#]</u>	<u>Comments</u>
428.4 2	3.46 11	1562.26	2 ⁺	1133.75	0 ⁺			
434.25 21	0.99 10	1562.26	2 ⁺	1128.04	2 ⁺			
439.17 27	0.62 10	2001.53	0 ⁺	1562.26	2 ⁺			
511.8605 31	1000	511.862	2 ⁺	0.0	0 ⁺	E2		α(K)=0.002 5; α(L)=0.0002 5 α(K) _{exp} =0.0048 8 (1967Vr05) E _γ : semi 1976Sh25 measurement rel to E(γ [±])=511.0034 14; other; 511.85 1 (1977Ok02). Absolute I _γ (512γ)=20.6% 6 (1969Od01), 21% 2 (1966Ov01), 22.0% 11 (1975Ge06), 20.5% (1953Ka47) I _γ /summed β ⁻ .
578.3 2	0.41 4	1706.41	0 ⁺	1128.04	2 ⁺			
616.22 9	37 4	1128.04	2 ⁺	511.862	2 ⁺	M1+E2	-7 2	α(K)=0.003 8; α(L)=0.00003 9 α(K) _{exp} =0.0030 (1977Ok02,1977Ok03) δ: taken from 1968Ha35 via γγ(θ). Branching: I _γ (616γ)/I _γ (1128γ)=1.88 38 (1977Ok02), 1.95 29 (1975Hs02). α(K)=0.0004; α(L)=0.00003 9 α(K) _{exp} =0.0029 2 (1977Ok02,1977Ok03) α(K) _{exp} : Other: 0.0030 7 (1967Vr05). (622γ)(512γ)(θ): 1972Av03, 1971Az02, 1968Ha35, 1953K151, 1953Kr07. β(622γ)(512γ)(θ): 1974Ra29, 1968Pe12. Branching: I(ce(K))(1134γ)/I _γ (622γ)=0.00049 5 (1977Ok03). Absolute I _γ (616+622γ)=10.6% 3 (1969Od01), 10% 1 (1966Ov01), 10.4% (1953Ka47) I _γ /summed β ⁻ . Absolute I _γ (622γ)=11.0 10 (1975Ge06) I _γ /summed β ⁻ ; γ-peak is corrected for unresolved I _γ (616γ) fraction.
621.93 6	487 6	1133.75	0 ⁺	511.862	2 ⁺	E2		
680.25 14	0.54 3	2242.48	2 ⁺	1562.26	2 ⁺			
684.8 2	0.27 1	2242.48	2 ⁺	1557.19	3 ⁺			
702.8 10	0.014 9	2705.30	(1) ⁺	2001.53	0 ⁺			
715.9 2	0.49 2	2278.14	0 ⁺	1562.26	2 ⁺			
717.4 2	0.32 2	1228.97	4 ⁺	511.862	2 ⁺			
751.3 2	0.053 11	2308.77	2 ⁺	1557.19	3 ⁺			
873.49 5	21.5 3	2001.53	0 ⁺	1128.04	2 ⁺	E2		
942.6 4	0.028 7	2500.30	2 ⁻	1557.19	3 ⁺			
1045.6 6	0.65 8	1557.19	3 ⁺	511.862	2 ⁺			
1050.41 6	76.4 15	1562.26	2 ⁺	511.862	2 ⁺	(M1+E2)	+0.24 1	δ: from γγ(θ) (1977Ok03). Δπ=no from decay scheme. Other: +0.23 0 (1982Ka10).

¹⁰⁶Rh β⁻ decay (30.07 s) [1982Ka10,1977Ok02,1977Ok03](#) (continued)

γ(¹⁰⁶Pd) (continued)

<u>E_γ[†]</u>	<u>I_γ^{†@}</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.[‡]</u>	<u>δ[#]</u>	<u>I_(γ+ce)[@]</u>	<u>Comments</u>
1062.14 5	1.57 2	2624.41	0 ⁺	1562.26	2 ⁺				
1108.7 1	0.29 1	2242.48	2 ⁺	1133.75	0 ⁺				
1114.48 5	0.58 9	2242.48	2 ⁺	1128.04	2 ⁺	(M1+E2)	+1.5 +3-2		α(K)=0.00072 α(K)exp≈0.0015 deduced from I(ce(K) 1114γ)/I(ce(K) 1194γ)≈0.5 (1973Av01). Δπ=no from decay scheme. δ: taken from (1973Av01). Obtained via γγ(θ) in ¹⁰⁶ Rh β ⁻ decay (30.07 s).
1128.07 5	19.8 3	1128.04	2 ⁺	0.0	0 ⁺	E2			α(K)=0.00067
1133.7		1133.75	0 ⁺	0.0	0 ⁺	E0		0.28 3	α(K)exp=0.00076 (1977Ok02,1977Ok03) E _γ : from 1977Ok03 (s); other: 1133.9 (1973Gr25). α(K)exp≥0.18 if I _γ (1134γ)≤1.3 (1977Ok03,1973Gr25). I(ce(K) 1134γ)/I(ce(K) 512γ)=0.048 4 (1977Ok03), 0.07 2 (1973Gr25), 0.044 5 (1974BeZH).
1150.2 2	0.15 1	2278.14	0 ⁺	1128.04	2 ⁺				
1159.9 2	0.008 6	2717.10		1557.19	3 ⁺				
1180.73 8	0.71 1	2308.77	2 ⁺	1128.04	2 ⁺	[M1+E2]	-0.06 12		Mult.: Δπ=no from decay scheme. δ: taken from 1977Ok03.
1194.54 5	2.81 2	1706.41	0 ⁺	511.862	2 ⁺				
1209.8 2	0.022 5	2439.07	2 ⁺	1228.97	4 ⁺				
1258.8 2	0.028 4	2820.98	2 ⁺	1562.26	2 ⁺				
1266.0 2	0.051 5	2828.29	0 ⁺	1562.26	2 ⁺				
1305.2 2	0.065 7	2439.07	2 ⁺	1133.75	0 ⁺				
1315.7 2	0.17 1	2877.93	0 ⁺	1562.26	2 ⁺				
1355.7 3	0.031 7	2917.84	2 ⁺	1562.26	2 ⁺				
1360.2 3	0.109 3	2917.84	2 ⁺	1557.19	3 ⁺				
1372.3 3	0.101 9	2500.30	2 ⁻	1128.04	2 ⁺				
1397.6 2	0.13 1	1909.47	(1 ⁺ ,2 ⁺)	511.862	2 ⁺				Branching: I _γ (1909γ)/I _γ (1398γ)=0.40 6 (1976SaYX, ¹⁰⁶ Ag decay) is used to apportion doublet I _γ (1909γ)=0.060 5 (1977Ok02).
1489.6 6	0.06 3	2001.53	0 ⁺	511.862	2 ⁺				
1496.33 13	1.09 3	2624.41	0 ⁺	1128.04	2 ⁺				
1498.8 2	0.33 2	3054.88	1 ⁺	1557.19	3 ⁺				
1562.25 6	8.0 1	1562.26	2 ⁺	0.0	0 ⁺				
1572.4 2	0.009 1	2705.30	(1) ⁺	1133.75	0 ⁺				
1577.2 2	0.052 9	2705.30	(1) ⁺	1128.04	2 ⁺				
1687.4 3	0.027 6	2820.98	2 ⁺	1133.75	0 ⁺				
1693.2 3	0.032 6	2820.98	2 ⁺	1128.04	2 ⁺				
1730.5 2	0.109 9	2242.48	2 ⁺	511.862	2 ⁺				
1766.25 5	1.68 3	2278.14	0 ⁺	511.862	2 ⁺				
1774.5 7	0.062 11	2902.49	2 ⁺	1128.04	2 ⁺				
1784.1 3	0.021 6	2917.84	2 ⁺	1133.75	0 ⁺				
1796.94 9	1.36 2	2308.77	2 ⁺	511.862	2 ⁺	[M1+E2]	+0.25 2		Mult.: Δπ=no from decay scheme. δ: from 1982Ka10. Other: +0.18 4 (1977Ok03).

¹⁰⁶Rh β⁻ decay (30.07 s) [1982Ka10,1977Ok02,1977Ok03](#) (continued)

γ(¹⁰⁶Pd) (continued)

<u>E_γ[†]</u>	<u>I_γ^{†@}</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.[‡]</u>	<u>δ[#]</u>	<u>Comments</u>
1855.0 2	0.061 4	3083.40	0	1228.97	4 ⁺			
1909.3 2	0.070 5	3037.34	1,2	1128.04	2 ⁺			
1927.22 9	0.75 2	2439.07	2 ⁺	511.862	2 ⁺	[M1+E2]	-0.07 +3-7	Mult.: Δπ=no from decay scheme. δ: from 1982Ka10 . Other: -0.10 9 (1977Ok03).
1954.6 4	0.009 2	3083.40	0	1128.04	2 ⁺			
1973.5 10	0.009 5	2484.66	(1 ⁻)	511.862	2 ⁺			
1988.44 8	1.28 2	2500.30	2 ⁻	511.862	2 ⁺	[E1+M2]	-0.05 +3-5	Mult.: Δπ=+ from decay scheme. δ: from 1982Ka10 . Other: -0.055 40 (1977Ok03).
2093.3 4	0.018 4	3221.39	0 ⁺	1128.04	2 ⁺			
2112.54 6	1.69 9	2624.41	0 ⁺	511.862	2 ⁺			
2185.7& 5	0.012 3	3320.5	0 ⁺	1133.75	0 ⁺			E _γ ,I _γ : if J ^π =0 ⁺ for 3320 and 1133 level than 2185.7γ is impossible.
2193.2 1	0.24 1	2705.30	(1) ⁺	511.862	2 ⁺	M1+E2	-0.17 6	δ: taken from 1977Ok03 . Other: +7 +infinity-4 (1982Ka10).
2242.4 1	0.101 3	2242.48	2 ⁺	0.0	0 ⁺			
2271.9 2	0.067 4	2783.79	2 ⁺	511.862	2 ⁺			
2309.0 1	0.276 7	2820.98	2 ⁺	511.862	2 ⁺			
2316.4 1	0.312 7	2828.29	0 ⁺	511.862	2 ⁺			
2366.04 7	1.14 3	2877.93	0 ⁺	511.862	2 ⁺			
2390.6 1	0.319 7	2902.49	2 ⁺	511.862	2 ⁺	(M1+E2)	-0.10 +7-10	δ: -0.02 8 (1977Ok03) γγ(θ).
2405.96 9	0.71 2	2917.84	2 ⁺	511.862	2 ⁺	(M1+E2)	-0.05 +2-5	Mult.: Δπ=no from decay scheme. δ: from 1982Ka10 . Other: -0.07 5 (1977Ok03).
2439.1 1	0.225 6	2439.07	2 ⁺	0.0	0 ⁺			
2456.8 2	0.014 2	2968.69	3 ⁻	511.862	2 ⁺			
2484.6 2	0.044 3	2484.66	(1 ⁻)	0.0	0 ⁺			
2525.2 6	0.010 2	3037.34	1,2	511.862	2 ⁺			
2542.7 1	0.145 4	3054.88	1 ⁺	511.862	2 ⁺	[M1+E2]	+0.07 7	δ: from 1982Ka10 . Other: +0.01 7 (1977Ok03).
2571.1 2	0.071 3	3083.40	0	511.862	2 ⁺	Q		
2651.4 3	0.032 4	3163.3	(1,2 ⁺)	511.862	2 ⁺	Q		
2705.3 3	0.123 5	2705.30	(1) ⁺	0.0	0 ⁺			
2709.5 3	0.183 5	3221.39	0 ⁺	511.862	2 ⁺			
2740.1 4	0.012 2	3252.0	2 ⁺	511.862	2 ⁺			
2787.3 7	0.0041 20	3299.2		511.862	2 ⁺			
2809.0 3	0.034 2	3320.5	0 ⁺	511.862	2 ⁺			
2821.1 3	0.059 2	2820.98	2 ⁺	0.0	0 ⁺			
2865.0& 10	0.0007 4	3376.6?		511.862	2 ⁺			
2902.5 8	0.0032 10	2902.49	2 ⁺	0.0	0 ⁺			
2917.9 3	0.045 2	2917.84	2 ⁺	0.0	0 ⁺			
3037.3 3	0.050 2	3037.34	1,2	0.0	0 ⁺			
3055.0 4	0.017 2	3054.88	1 ⁺	0.0	0 ⁺			
3164.7& 10	0.0014 7	3163.3	(1,2 ⁺)	0.0	0 ⁺			E _γ ,I _γ : if placement of this γ is correct then J=0 is excluded for the 3163 level.
3249.8 5	0.0051 13	3249.9	2 ⁺	0.0	0 ⁺			
3273.4 7	0.0025 11	3273.5	1,2	0.0	0 ⁺			

5

¹⁰⁶Rh β⁻ decay (30.07 s) [1982Ka10](#),[1977Ok02](#),[1977Ok03](#) (continued)

γ(¹⁰⁶Pd) (continued)

<u>E_γ[†]</u>	<u>I_γ^{†@}</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>
3375.9 14	0.00055 10	3376.6?		0.0	0 ⁺
3401.8 9	0.00061 9	3401.9?		0.0	0 ⁺

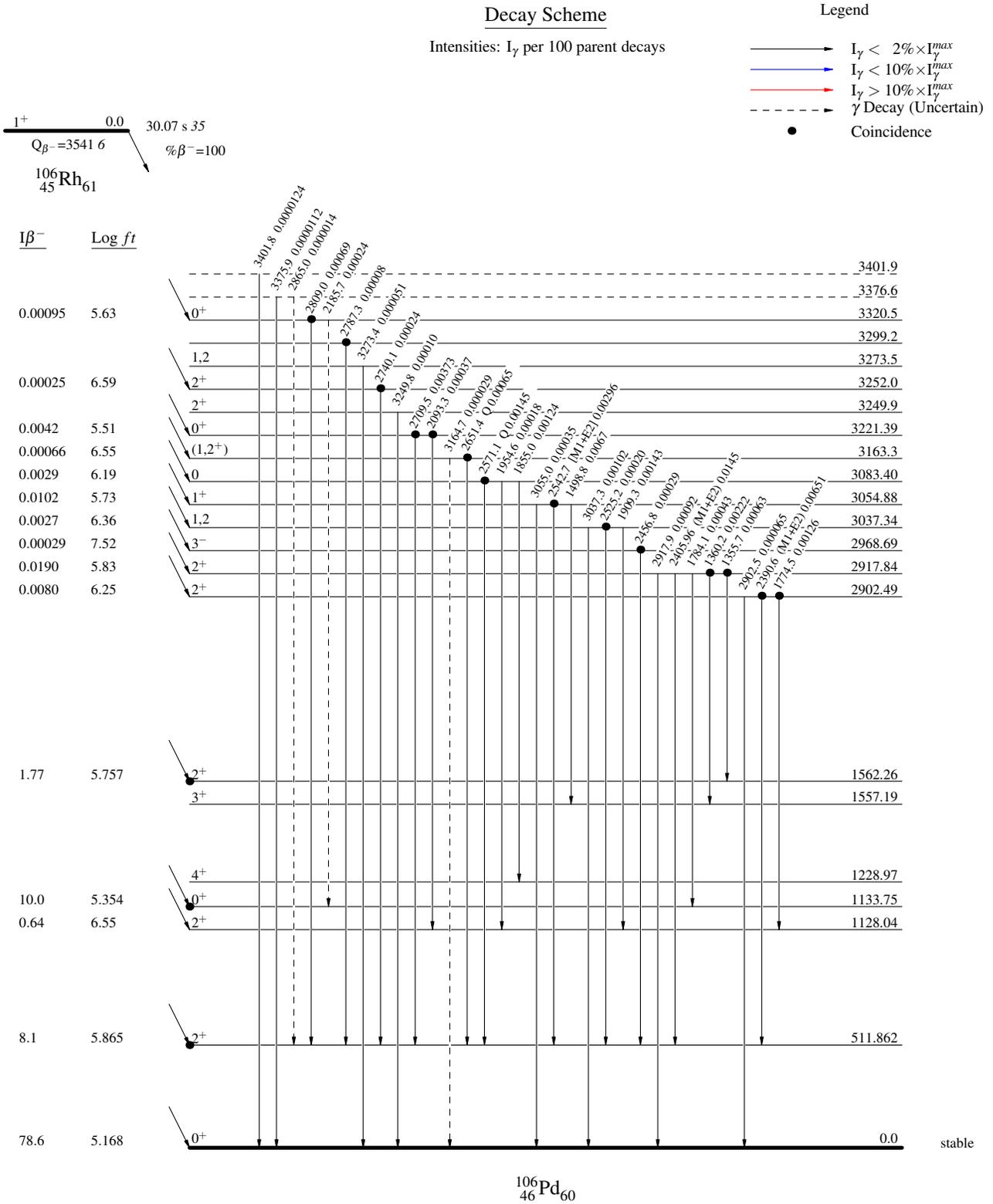
[†] Taken from [1982Ka10](#). Others: [1950Me86](#), [1952Al06](#), [1953Ka47](#), [1955Al44](#), [1957Fi50](#), [1958Gr07](#), [1960Ro12](#), [1960Se05](#), [1961Sm04](#), [1962Am03](#), [1966Ov01](#), [1967Ra11](#), [1967Fo09](#), [1967Vr05](#), [1968Ha35](#), [1968We16](#), [1969Od01](#), [1969St03](#), [1971Az02](#), [1972GeZG](#), [1972Ma71](#), [1973Ar16](#), [1973Av01](#), [1973Gr25](#), [1975Ge06](#), [1975Hs02](#), [1977Ok02](#).

[‡] From α(K)exp and or A₂,A₄ coef in γγ(θ).

From γγ(θ) data.

@ For absolute intensity per 100 decays, multiply by 0.0204 4.

& Placement of transition in the level scheme is uncertain.

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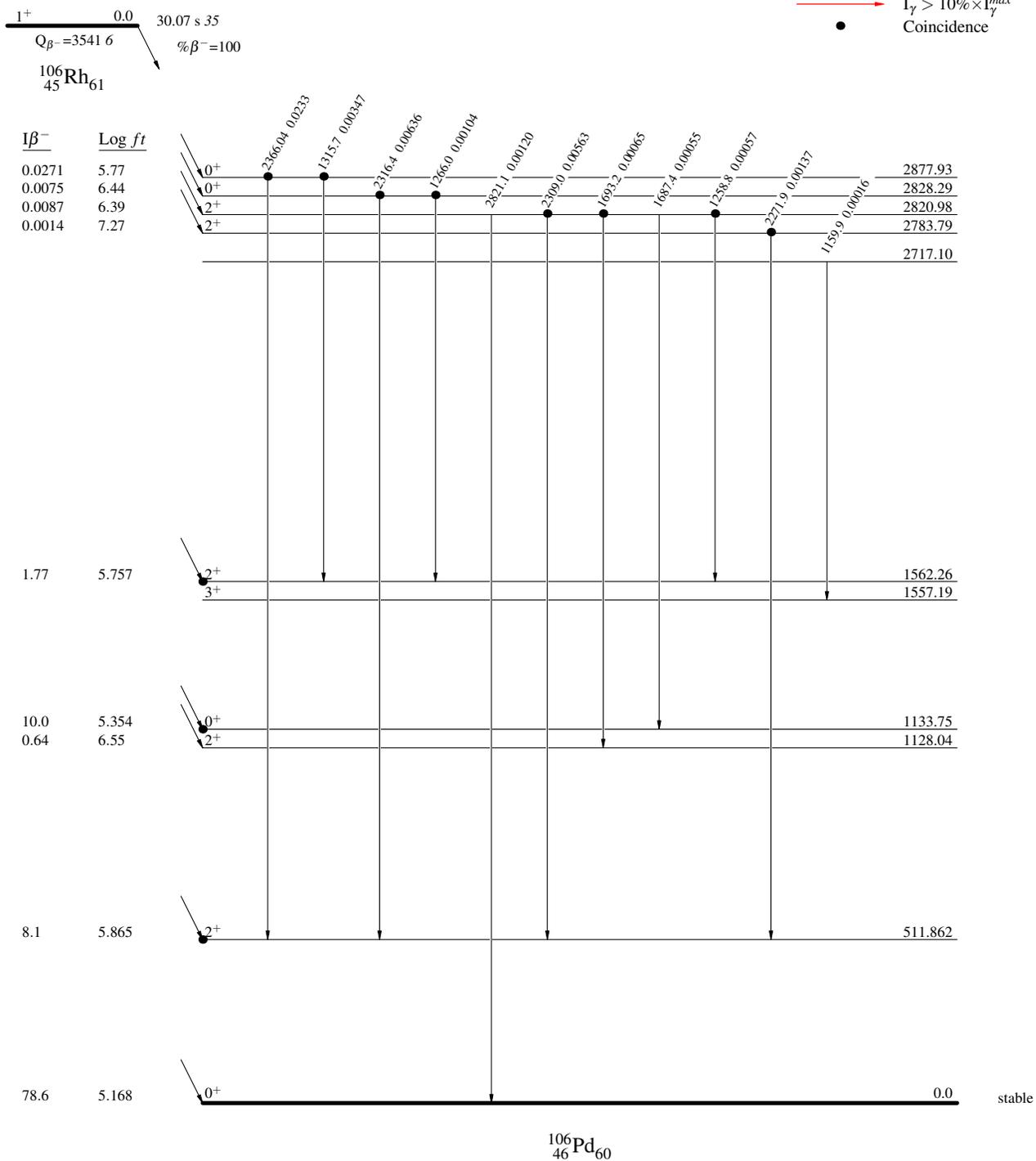
^{106}Rh β^- decay (30.07 s) 1982Ka10,1977Ok02,1977Ok03

Decay Scheme (continued)

Intensities: I_γ per 100 parent decays

Legend

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



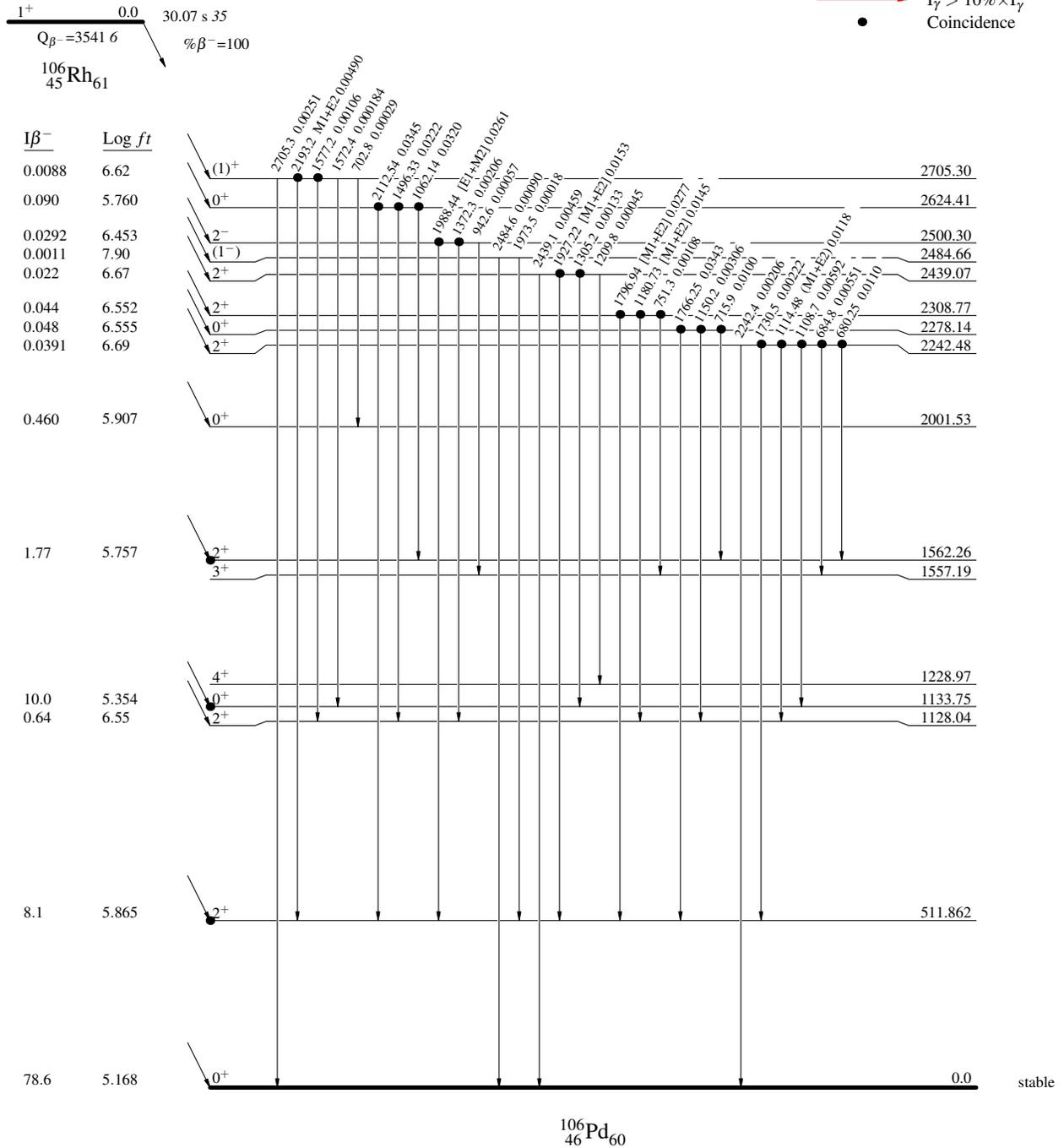
^{106}Rh β^- decay (30.07 s) 1982Ka10,1977Ok02,1977Ok03

Decay Scheme (continued)

Intensities: I_γ per 100 parent decays

Legend

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



$^{106}\text{Rh} \beta^-$ decay (30.07 s) 1982Ka10,1977Ok02,1977Ok03

Decay Scheme (continued)

Intensities: I_γ per 100 parent decays

Legend

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

