

⁸⁸Rb β⁻ decay 2002Mi07,1976Bu05

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. A. McCutchan and A. A. Sonzogni		NDS 115, 135 (2014)	1-Nov-2013

Parent: ⁸⁸Rb: E=0.0; J^π=2⁻; T_{1/2}=17.773 min *II*; Q(β⁻)=5312.4 *II*; %β⁻ decay=100.0

2002Mi07: ⁸⁸Rb activity from neutron capture on ⁸⁷Rb. Measured E_γ, I_γ, and β-γ coincidence using 4πβ counter and a single HPGe detector.

1976Bu05: ⁸⁸Rb activity from ²³⁵U(n,f) and subsequent mass-separation and gas-chromatographic-isolation. Measured E_γ, I_γ, and γγ using two coaxial Ge(Li) detectors (FWHM=2.5 keV), a Compton-suppressed Ge(Li) detector, and a planar Ge(Li) low-energy photon spectrometer.

1979He01: Precision measurements of E_γ by applying cascade cross-over relations using Ge(Li) detector.

1976Wo05: ⁸⁸Rb activity from mass separated fission products. Measured absolute I_β and I_γ using Ge(Li) detector and plastic scintillator.

Others: **2003Su38**, **1974Er08**, **1972Ra13**, **1971Pr01**, **1970Ka28**, **1969He16**, **1969Ly01**, **1969Ra05**. **1976Bu05** showed that additional γ's observed by **1974Er08** and **1972Ra13** are not due to ⁸⁸Rb.

β spectrum: **1969Ly01**, **1969Ra05**, **1955Th01**, **1951Bu02**.

βγ directional correlation and βγ(CP)- correlation: **1968He06**.

Theoretical investigations of ⁸⁸Rb β⁻ decay: **1978Sz01**, **1971Ve05**, **1970Be55**, **1968He06**.

α: **Additional information 1**.

⁸⁸Sr Levels

E(level) [†]	J ^π [‡]	Comments
0.0	0 ⁺	β-transition to g.s. has first-unique forbidden shape (1969Ly01 , 1955Th01 , 1951Bu02). I _β =65.5% (1969Ly01), 76% 4 from I _γ (1836γ)/ΣI _β =0.231 <i>II</i> (1969Ra05).
1836.077 <i>21</i>	2 ⁺	
2734.128 <i>12</i>	3 ⁻	
3218.55 <i>4</i>	2 ⁺	
3486.59 <i>5</i>	1 ⁺	
3523.6 <i>5</i>	(2 ⁺)	
3634.76 <i>12</i>	(3) ⁺	
4035.6 <i>4</i>	2 ⁺	
4224.1 <i>6</i>		
4413.91 <i>3</i>	(2 ⁺)	
4514.017 <i>20</i>	2 ⁻	
4742.56 <i>8</i>	1 ⁻	
4845.65 <i>3</i>	(3) ⁻	
4853.019 <i>16</i>	1 ⁻	

[†] From a least-squares fit to E_γ by evaluators.

[‡] From the Adopted Levels.

β⁻ radiations

E(decay)	E(level)	I _β ^{-†‡}	Log ft	Comments
(459.4 <i>11</i>)	4853.019	0.726 <i>13</i>	5.193 <i>9</i>	av E _β =142.59 <i>40</i>
(466.8 <i>11</i>)	4845.65	0.401 <i>6</i>	5.474 <i>8</i>	av E _β =145.25 <i>40</i>
(569.8 <i>11</i>)	4742.56	0.178 <i>19</i>	6.13 <i>5</i>	av E _β =183.32 <i>42</i>
(798.4 <i>11</i>)	4514.017	2.319 <i>22</i>	5.536 <i>5</i>	av E _β =272.58 <i>45</i>
(898.5 <i>11</i>)	4413.91	0.254 <i>9</i>	6.685 <i>16</i>	av E _β =313.38 <i>46</i>
(1088.3 <i>13</i>)	4224.1	0.030 <i>3</i>	7.92 <i>5</i>	av E _β =392.96 <i>54</i>
(1276.8 <i>12</i>)	4035.6	0.0137 <i>21</i>	8.53 <i>7</i>	av E _β =474.28 <i>51</i>
(1677.6 [#] <i>11</i>)	3634.76	0.005 <i>6</i>	9.4 <i>6</i>	av E _β =652.70 <i>50</i>

Continued on next page (footnotes at end of table)

^{88}Rb β^- decay 2002Mi07,1976Bu05 (continued) β^- radiations (continued)

<u>E(decay)</u>	<u>E(level)</u>	<u>$I\beta^{-\dagger\ddagger}$</u>	<u>Log ft</u>	<u>Comments</u>
(1788.8 [#] 12)	3523.6	<0.003	>9.8	av $E\beta=703.16$ 55
(1825.8 [#] 11)	3486.59	0.016 11	9.1 3	av $E\beta=720.04$ 51
(2093.8 11)	3218.55	1.038 12	7.512 6	av $E\beta=843.27$ 51
(2578.3 11)	2734.128	13.59 21	6.772 7	av $E\beta=1069.33$ 52
(3476.3 11)	1836.077	4.93 24	7.768 22	av $E\beta=1495.21$ 53
(5312.4 11)	0.0	76.51 11	9.2455 ^{1u} 9	av $E\beta=2371.16$ 53

[†] From an intensity balance at each level.

[‡] Absolute intensity per 100 decays.

[#] Existence of this branch is questionable.

γ(⁸⁸Sr)

I_γ normalization: Weighted average of absolute I_γ measurements, I_γ(1836γ)=22.73% 15 (2007Mi07) and 22.91% 17 (2003Su38).

E _γ [†]	I _γ ^{‡e}	E _i (level)	J _i ^π	E _f	J _f ^π	Mult.#	δ [@]	α	Comments
338.95 7	0.060 3	4853.019	1 ⁻	4514.017	2 ⁻				
416.2 3	0.0039 ^c 14	3634.76	(3) ⁺	3218.55	2 ⁺	M1(+E2)			
439.2 3	0.015 ^c 4	4853.019	1 ⁻	4413.91	(2 ⁺)				
484.53 16	0.030 ^c 7	3218.55	2 ⁺	2734.128	3 ⁻				
(891.3 ^a)	0.022 ^b 4	4413.91	(2 ⁺)	3523.6	(2 ⁺)				
898.03 4	14.40 24	2734.128	3 ⁻	1836.077	2 ⁺	E1(+M2) ^d	-0.002 ^d 9	0.000308 5	α=0.000308 5; α(K)=0.000273 4; α(L)=2.92×10 ⁻⁵ 5; α(M)=4.90×10 ⁻⁶ 7; α(N)=6.16×10 ⁻⁷ 9 α(O)=4.02×10 ⁻⁸ 6; α(N+..)=6.56×10 ⁻⁷ 10 δ: Other: <0.03 (1969He16). I _γ : weighted average of 14.68 % 13 (2002Mi07) and 14.24 % 10 (2003Su38).
1027.3 3	0.011 ^c 5	4514.017	2 ⁻	3486.59	1 ⁺				
1217.97 18	0.052 4	4853.019	1 ⁻	3634.76	(3) ⁺				
1366.26 12	0.113 9	4853.019	1 ⁻	3486.59	1 ⁺	E1+M2	-0.05 2	0.000294 5	α=0.000294 5; α(K)=0.0001266 21; α(L)=1.347×10 ⁻⁵ 22; α(M)=2.26×10 ⁻⁶ 4 α(O)=1.87×10 ⁻⁸ 3; α(N+..)=0.0001520
1382.45 ^{&} 5	0.784 9	3218.55	2 ⁺	1836.077	2 ⁺	M1+E2	+0.04 2	0.000325 5	α=0.000325 5; α(K)=0.000255 4; α(L)=2.73×10 ⁻⁵ 4; α(M)=4.58×10 ⁻⁶ 7; α(N)=5.77×10 ⁻⁷ 8 α(O)=3.82×10 ⁻⁸ 6; α(N+..)=3.84×10 ⁻⁵ 6
(1627 ^a)	0.0093 ^b 18	4845.65	(3) ⁻	3218.55	2 ⁺				
1679.6 3	0.050 6	4413.91	(2 ⁺)	2734.128	3 ⁻				
(1687.3 ^a)	0.011 ^b 7	3523.6	(2 ⁺)	1836.077	2 ⁺				
1779.870 ^{&} 21	0.238 5	4514.017	2 ⁻	2734.128	3 ⁻				
1798.35 19	0.053 4	3634.76	(3) ⁺	1836.077	2 ⁺	M1+E2 ^d	-0.08 ^d 2		
1836.00 5	22.81 11	1836.077	2 ⁺	0.0	0 ⁺	E2 ^d		0.000393 6	α=0.000393 6; α(K)=0.0001449 21; α(L)=1.550×10 ⁻⁵ 22; α(M)=2.60×10 ⁻⁶ 4 α(O)=2.15×10 ⁻⁸ 3; α(N+..)=0.000230
2111.50 ^{&} 4	0.122 4	4845.65	(3) ⁻	2734.128	3 ⁻				
2118.867 ^{&} 20	0.469 6	4853.019	1 ⁻	2734.128	3 ⁻				
2388.0 6	0.030 3	4224.1		1836.077	2 ⁺				
2577.791 ^{&} 28	0.197 3	4413.91	(2 ⁺)	1836.077	2 ⁺				
2677.892 ^{&} 21	2.130 21	4514.017	2 ⁻	1836.077	2 ⁺	E1+M2	+0.072 7	0.001104 16	α=0.001104 16; α(K)=4.49×10 ⁻⁵ 7; α(L)=4.74×10 ⁻⁶ 7; α(M)=7.94×10 ⁻⁷ 12; α(N)=1.001×10 ⁻⁷ 15 α(O)=6.62×10 ⁻⁹ 10; α(N+..)=0.001054 15

⁸⁸Rb β⁻ decay [2002Mi07,1976Bu05](#) (continued)

γ(⁸⁸Sr) (continued)

E_γ [†]	I_γ ^{‡e}	E_i (level)	J_i^π	E_f	J_f^π	Mult.#	δ [@]	α	Comments
2734.086 & 13	0.093 10	2734.128	3 ⁻	0.0	0 ⁺	E3 ^d			
3009.52 & 4	0.270 4	4845.65	(3) ⁻	1836.077	2 ⁺	(E1+M2)	+0.075 15	0.001266 18	$\alpha=0.001266$ 18; $\alpha(K)=3.82\times 10^{-5}$ 6; $\alpha(L)=4.03\times 10^{-6}$ 6; $\alpha(M)=6.75\times 10^{-7}$ 10; $\alpha(N)=8.51\times 10^{-8}$ 13 $\alpha(O)=5.64\times 10^{-9}$ 9; $\alpha(N+..)=0.001223$ 18
3017.19 20	0.005 ^c 2	4853.019	1 ⁻	1836.077	2 ⁺				
3218.48 & 5	0.237 4	3218.55	2 ⁺	0.0	0 ⁺	E2 ^d			
3486.47 & 6	0.140 3	3486.59	1 ⁺	0.0	0 ⁺	M1 ^d			
3524.0 6	0.0053 10	3523.6	(2 ⁺)	0.0	0 ⁺	(E2)			
4035.5 4	0.0137 21	4035.6	2 ⁺	0.0	0 ⁺	E2 ^d			
4742.42 & 8	0.178 19	4742.56	1 ⁻	0.0	0 ⁺	E1 ^d			
4852.882 & 24	0.0116 17	4853.019	1 ⁻	0.0	0 ⁺				

[†] From [1976Bu05](#), except where noted.

[‡] From [2002Mi07](#), except where noted.

From $\gamma\gamma(\theta)$, except where noted. Parity from adopted $\Delta\pi$.

@ From $\gamma\gamma(\theta)$ in [1970Ka28](#), except where noted.

& From [1979He01](#).

^a Not observed in β⁻ decay but γ is known from other experiments. E from adopted gammas.

^b Deduced from adopted branching ratio.

^c From [1976Bu05](#).

^d From the Adopted Gammas.

^e Absolute intensity per 100 decays.

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Decay Scheme

Intensities: I_γ per 100 parent decays

Legend

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$
- γ Decay (Uncertain)

