^{86}Rb β^- decay (18.671 d) 2016Ma49,2021Kr05

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	A. Negret and B. Singh	NDS 203,283 (2025)	20-Jan-2025

Parent: ^{86}Rb: E=0.0; $J^\pi=2^-$; $T_{1/2}$=18.671 d *10*; Q(β^-)=1776.10 *20*; %β^- decay=99.9948 *5*

^{86}Rb-Q(β^-): From 2021Wa16.

^{86}Rb-$T_{1/2}$: weighted average of 18.684 d *9* (2016Ma49, decay curve of γ radiation for 61 runs using a chemically-purified source supplied by POLATOM); 18.631 d *18* (1981Mi10), 18.82 d *11* (1972Em01), 18.61 d *4* (1971Ba28), 18.82 d *11* (1967Gl05), 18.68 d *7* (1957Wr37), 18.64 d *4* (1955Ni09), 18.66 d *3* (1955Em20). Others: 18.7 d 5 (1958Ro62), 19.5 d (1948Za02), 19.5 d (1941He02), 18 d (1937Sn02).

^{86}Rb-$T_{1/2}$: Additional information 1.

^{86}Rb-%β^- decay: $\varepsilon/\beta^-=5.2\times10^{-5}$ *5* (1968Al02).

2021Kr05: SrO and $SrCO_3$ samples irradiated at the Oregon State University TRIGA reactor. Measured Eγ, Iγ, γ(t) using HPGe detectors.

2016Ma49: measured Eγ, absolute Iγ, half-life of ^{86}Rb decay, Iγ/Iβ using $4\pi\beta\gamma$ coin system at the Czech Metrology Institute.

1991Mi04 (previous study by 1981Mi10): measured emission probability of the 1077-keV γ-ray by $4\pi\beta\gamma$-coin system at Nagoya University, Japan.

Theory references for ^{86}Rb decay: 1986Ci02, 1985To18, 1965Si10, 1964Wa21.

Additional information 2.

^{86}Sr Levels

E(level)	J^π[†]	$T_{1/2}$	Comments
0.0	0^+	stable	
1076.785 *10*	2^+	1.46 ps +*9*−*8*	E(level): from Eγ. $T_{1/2}$: from Adopted Levels, Gammas. 1955Be48 measured $T_{1/2}\leq$70 ps from $\beta\gamma$(t).

[†] From the Adopted Levels.

β^- radiations

^{86}Rb decays by ε also with %ε=0.0052.

β_1 end-point energy: 1964Da16, 1966An10, 1975Be21, 1975Ra09. Others: 1965Th07, 1956Be47, 1956La24, 1954Po26, 1954Dm33, 1954Ca18, 1953Ma75, 1952Mo29, 1951Ma75, 1950Mu67, 1948Za02.

β_2 end-point energy: 1968Da12, 1966An10. Others: 1965Th07, 1958Ro62, 1956Be47, 1956La24, 1954Po26, 1954Dm33, 1953Ma75, 1951Ma75, 1950Mu67, 1948Za02.

β_1 shape: 1980HuZS, 1975Ra09, 1975Be21, 1966An10, 1965Th07, 1956La24, 1956Be47, 1954Po26, 1953Ma75, 1954Dm33, 1952Mo29, 1950Mu67, 1948Za02. Small deviations from the unique first-forbidden shape: 1964Da16.

β_2 shape: 1969LaZW, 1968Da12, 1966An10, 1966Sp06, 1965Th07, 1961De26, 1958Ro62, 1956La24, 1954Po26, 1950Mu67.

Additional information 3.

$\beta\gamma$(t): 1955Be48.

$\beta\gamma(\theta)$: 1974Ap02, 1970De20, 1969LaZW, 1966Ra07, 1965Si09, 1963Al24, 1961Ha18, 1961De26, 1960Pe06, 1960Fi02, 1959Kl45, 1953Ma75, 1951St59.

$\beta\gamma$(lin pol): 1953Ha40.

$\beta\gamma$(CP): 1974Ap02, 1971Bo11, 1969Me02, 1969Vi04, 1968Da12, 1966Re14, 1965Kn04, 1965Si09, 1963Bo20, 1958Bo72, 1953Ha40.

β(longitudinal pol): 1959Jo24.

Inner bremsstrahlung spectrum: 1985Ba58.

ε/β^-: 1968Al02.

Shell model wave functions extracted from β decay observables by 1974Ap02. Influence of core polarization on the transition matrix elements calculated by 1972Ej01.

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β^- radiations (continued)

E(decay)	E(level)	Iβ⁻†	Log *ft*	Comments
(699.3 *10*)	1076.785	8.859 *29*	7.9408 *15*	av Eβ=234.65 *9* E(decay): 700 *5* from weighted average of 702 *4* (1966An10), 689 *9* (1968Da12). Others: 1965Th07, 1956La24, 1954Po26, 1950Mu67. Spectrum shape: 1969LaZW, 1968Da12, 1966An10, 1966Sp06, 1965Th07, 1961De26, 1958Ro62, 1956La24, 1954Po26, 1950Mu67.
(1776.1 *14*)	0.0	91.141 *29*	9.45773[1u] *40*	av Eβ=702.48 *9* E(decay): 1774.6 *30* from weighted average of 1774 *5* (1964Da16), 1770 *3* (1966An10), 1779 *3* (1975Be21) and 1775 *3* (1975Ra09). Others: 1965Th07, 1956La24, 1954Po26, 1953Ma75, 1952Mo29. Spectrum shape: unique first-forbidden (1965Th07,1956La24,1956Be47, 1954Po26, 1953Ma75, 1954Dm33, 1952Mo29, 1950Mu67, 1948Za02). Small deviations from the unique first-forbidden shape: 1964Da16.

† For absolute intensity per 100 decays, multiply by 0.999948 *5*.

γ(^{86}Sr)

Iγ normalization: From weighted average of Iγ/Iβ(total)=0.0874 *7* (2016Ma49, 4πβγ coin); 0.08884 *29* (1991Mi04, 4πβγ coin, earlier value from the same group was 0.0864 *4* in 1981Mi10, 4πβγ coin); 0.089 *3* (1965Gu06, 4πβγ coin); 0.0879 *9* (1962Br15, 4πβ and γ counting); 0.087 *2* (1960Ca18, 4πβγ coin).
Iγ/I(β⁻): 2016Ma49, 1991Mi04, 1981Mi10, 1965Gu06, 1962Br15, 1960Ca18, 1955Em04, 1954Ly41.
Eγ: 2016Ma49, 1967Vr07, 1967Pi03, 1966An10, 1965Ma09, 1963Ha41, 1954Po26, 1954Dm33, 1953Ma75, 1950Mu67, 1948Za02.
γ(circ pol): 1963Bo20.
No K x ray (<0.1%): 1953Sc39.

E_γ	I_γ†	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α‡	Comments
1076.785 *10*	100	1076.785	2^+	0.0	0^+	E2	4.89×10^{-4} *7*	α(K)=0.000433 *6*; α(L)=4.70×10^{-5} *7*; α(M)=7.89×10^{-6} *11* α(N)=9.89×10^{-7} *14*; α(O)=6.41×10^{-8} *9* E_γ: from 2021Kr05. Others: 1076.772 *75* (2016Ma49), 1077.1 *7* (1967Pi03), 1075.3 *12* (1965Ma09), 1077.2 *5* (1963Ha41). Mult.: from the Adopted Gammas.

† For absolute intensity per 100 decays, multiply by 0.08855 *29*.
‡ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with "Frozen Orbitals" approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

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Decay Scheme

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