^{86}Ga β^- decay (51 ms) 2013Mi19,2023Yo04

History

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

Parent: ^{86}Ga: E=0; $T_{1/2}$=51 ms *2*; Q(β^-)=15640 *syst*; %β^- decay=100

^{86}Ga-$T_{1/2}$: From ^{86}Ga Adopted Levels.

^{86}Ga-Q(β^-): 15640 *590* (syst,2021Wa16).

^{86}Ga-%β^- decay: %β^-=100, %β^-n=59.5 *28* and %β^-2n=14.7 *14* from ^{86}Ga Adopted Levels.

2013Mi19: ^{86}Ga produced in U(p,F) reaction at 50 MeV using ISOL-HRIBF facility at ORNL. Ions of ^{86}Ga were extracted using resonant ionization laser ion source (RILIS). ^{86}Ga beam was transmitted to Radioactive Ion Beam Spectroscopy Station (LeRIBSS). Measured Eγ, Iγ, $\gamma\gamma$-coin, $\beta\gamma$-coin, nγ-coin.

2023Yo04: ^{86}Ga produced in ^{9}Be(^{238}U,F),E(^{238}U)=345 MeV/nucleon reaction on a 4-mm thick ^{9}Be production target followed by the separation and identification of fragments of interest by A/Q on the basis of magnetic rigidity Bρ, time-of-flight (tof) and energy loss (ΔE) using the BigRIPS in-flight separator, plastic scintillation counters, and position-sensitive parallel-plate avalanche counters (PPACs), finally implanted into active stoppers: AIDA in one run, and WAS3Abi in a second run, both consisting of double-sided silicon strip detectors (DSSDs) at the RIBF-RIKEN facility. Measured Eγ, Iγ, Eβ, Iβ, E(n), I(n), ion-β correlations, (neutron)ion-β-coin, n$\beta\gamma$-coin, (2n)$\beta\gamma$-coin, $\gamma\gamma$-coin using two clover HPGe detectors for γ rays, and the BRIKEN detector consisting of 140 proportional counters filled with ^{3}He gas for neutrons. Deduced half-life of ^{86}Ga decay, %β^-n or P1n, %β^-2n or P2n, and the decays of ^{86}Ga to ^{86}Ge, ^{85}Ge, and ^{84}Ge.

Theoretical calculations for $T_{1/2}$ and %β^-n: 2022Qu03, 2016Mu16, 2016Sh39, 2014Mi23, 2005Bo19.

^{86}Ge Levels

E(level)[†]	J$^\pi$	$T_{1/2}$[‡]	Comments
0.0	0$^+$	221.6 ms *11*	
527.30 *44*	(2$^+$)		
1024.3? *10*			
4350+x			E(level): x<11290 *740* from Q(β^-)(^{86}Ga)=15640 *590* and S(n)(^{86}Ge)=4350 *444* (2021Wa16).
7390+x			E(level): x<8250 *740* from Q(β^-)(^{86}Ga)=15640 *590* and S(2n)(^{86}Ge)=7390 *444* (2021Wa16).

† From Eγ data.
‡ From Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-[†]	Comments
(2250[‡] *syst*)	7390+x	14.7 *14*	Iβ^-: from %β^-2n=14.7 *14* for ^{86}Ga decay.
(5290[‡] *syst*)	4350+x	59.5 *28*	Iβ^-: from %β^-n=59.5 *28* for ^{86}Ga decay.

† Absolute intensity per 100 decays.
‡ Estimated for a range of levels.

γ(^{86}Ge)

Iγ normalization: Absolute γ-intensities given in 2023Yo04 and 2013Mi19.

Continued on next page (footnotes at end of table)

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$\gamma(^{86}Ge)$ (continued)

E_γ †	I_γ †‡	E_i(level)	J_i^π	E_f	J_f^π	Comments
527.30 *44*	7.3 *9*	527.30	(2^+)	0.0	0^+	%Iγ=7.3 *9* I_γ: Other: 7 (2013Mi19).
1024.3 *10*	2.8 *9*	1024.3?		0.0	0^+	%Iγ=2.8 *9*

† From 2023Yo04. Uncertainties computed by evaluators based on the systematic and statistical uncertainties given by authors.
‡ Absolute intensity per 100 decays.

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Decay Scheme

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