^{44}V ε decay (150 ms) 1997Ha04

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 190,1 (2023)	20-Jun-2023

Parent: ^{44}V: E=268 *10*; $J^\pi=(6)^+$; $T_{1/2}$=150 ms *3*; Q(ε)=13749 *7*; %ε+%β^+ decay=100

^{44}V-E,J^π,$T_{1/2}$: From the Adopted Levels of ^{44}V.

^{44}V-$T_{1/2}$: From 1997Ha04, average of values for five different γ rays, adopted in ^{44}V Adopted Levels.

^{44}V-Q(ε): From Adopted Levels of ^{44}V based on newly measured mass of ^{44}V by 2022Wa39. Other: 13741 *7* from 2021Wa16.

^{44}V-%ε+%β^+ decay: Evaluators assume that there is no IT decay from the 150-ms isomer.

1997Ha04: ^{44}V produced by ^{40}Ca(^{6}Li,2n) E=35 MeV at the TASCC facility of the Chalk River Laboratories. 68% efficient HPGe detectors for detecting γ-rays and scintillators for detecting positrons. Measured Eγ, Iγ, $\gamma\gamma$, $T_{1/2}$(^{44}V isomer), $\gamma\beta\beta$ and $\gamma\gamma\beta$ coin. Deduced levels, branching ratios, log *ft*.

1994Ke07: ^{44}V produced by Ni(^{58}Ni,X) with E=69 MeV/nucleon ^{58}Ni beam produced from the GANIL cyclotrons on a natural nickel target of 50 mg/cm^2. A telescope of two 150 μm silicon detectors for detecting product nuclei, a plastic scintillator for detecting positrons and four germanium detectors for detecting γ-rays. Measured $T_{1/2}$, $\beta\gamma$ coin. Deduced an isomeric ratio of 25% in ^{44}V.

^{44}Ti Levels

E(level)[†]	J^π[‡]	$T_{1/2}$[‡]
0.0	0^+	59.1 y *3*
1083.10 *10*	2^+	2.57 ps *37*
2454.35 *13*	4^+	0.433 ps *35*
4015.37 *15*	6^+	0.42 ps *6*
4803.07 *32*	(6^+)	
6848.87 *20*	$(6)^+$	

† From a least-squares fit to γ-ray energies.
‡ From the Adopted Levels.

ε,β^+ radiations

β^+ feeding to 2454 level: 6.0 *51* (from intensity balance, 1997Ha04). It is set at zero here since almost no feeding is expected from log *ft*>10.3 for ΔJ=2, no transitions.

Unrealistic intensity balance=−5.7 *9* at 4803 level suggests that other γ transitions, yet unseen, de-excite the 4803 level.

E(decay)	E(level)	Iβ^+ [‡]	Iε[‡]	Log *ft*	I($\varepsilon+\beta^+$)[†‡]	Comments
(7168 *12*)	6848.87	44 *5*	<0.26	3.44 *5*	44 *5*	av Eβ=2859 *6*; εK=8.64×10^{-4} *12*; εL=9.41×10^{-5} *13*; εM+=1.539×10^{-5} *23* Superallowed β transition.
(10002 *12*)	4015.37	56 *5*	<0.14	4.110 *40*	56 *5*	av Eβ=4247 *6*; εK=2.912×10^{-4} *34*; εL=3.170×10^{-5} *38*; εM+=5.19×10^{-6} *7*

† From γ intensity balance at each level.
‡ Absolute intensity per 100 decays.

^{44}V ε decay (150 ms) 1997Ha04 (continued)

γ(^{44}Ti)

Iγ normalization: I(γ+ce)(1083γ)=100.

E_γ [†]	I_γ [†#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]
1083.09 *10*	100.0	1083.10	2^+	0.0	0^+	E2
1371.22 *8*	94.3 *36*	2454.35	4^+	1083.10	2^+	E2
1561.00 *8*	85.9 *35*	4015.37	6^+	2454.35	4^+	E2
2045.6 *4*	8.1 *6*	6848.87	$(6)^+$	4803.07	(6^+)	
2348.5 *4*	2.4 *6*	4803.07	(6^+)	2454.35	4^+	
2833.42 *14*	32.9 *24*	6848.87	$(6)^+$	4015.37	6^+	

† From 1997Ha04.
‡ From the Adopted Gammas.
# Absolute intensity per 100 decays.

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Decay Scheme

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