

^{89}Nb ε decay (66 min) 1974Vo08

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 114, 1 (2013)	20-Oct-2012

Parent: ^{89}Nb : E<35; $J^\pi=(1/2)^-$; $T_{1/2}=66$ min 2; $Q(\varepsilon)=4226$ 27; % $\varepsilon+\beta^+$ decay=100.0

^{89}Nb -Q(ε): From 2011AuZZ. Other: 4218 27 (2003Au03).

Others: 1969HaZP, 1966Ha45, 1964Bu11, 1955Ma13, 1954Di16.

Additional information 1.

1974Vo08: measured γ , $\gamma\gamma$.

Energy balance: total decay energy of 4242 keV 182 deduced (using RADLIST code) from proposed decay scheme is in agreement with the expected value of 4204 keV 34, indicating that the decay scheme is complete.

 ^{89}Zr Levels

E(level)	$J^\pi \dagger$	$T_{1/2} \ddagger$
0.0	9/2 ⁺	78.41 h 12
588.0 20	1/2 ⁻	4.161 min 10
1095.5 7	3/2 ⁻	
1865.1 8	3/2 ⁻	

\dagger From Adopted Levels.

 ε, β^+ radiations

E(decay) \dagger	E(level)	$I\beta^+ \ddagger$	$I\varepsilon \ddagger$	Log ft	$I(\varepsilon+\beta^+) \ddagger$	Comments
2472 50	1865.1	4 1	4 1	5.87 7	8 1	av $E\beta=627$ 19; $\varepsilon K=0.396$ 20; $\varepsilon L=0.0473$ 24; $\varepsilon M+=0.0106$ 6
3212 30	1095.5	62 6	13 1	5.55 6	75 7	av $E\beta=978$ 19; $\varepsilon K=0.154$ 8; $\varepsilon L=0.0183$ 9; $\varepsilon M+=0.00411$ 20
(3.67×10^3 3)	588.0	15 6	2 1	6.6 2	17 7	av $E\beta=1215$ 19; $\varepsilon K=0.089$ 4; $\varepsilon L=0.0106$ 5; $\varepsilon M+=0.00237$ 10

\dagger From 1970HaZH: β spectrometer.

\ddagger Absolute intensity per 100 decays.

 $\gamma(^{89}\text{Zr})$

$I\gamma$ normalization: from $\text{Ti}(588\gamma)=100$.

E_γ	$I_\gamma \dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	$\alpha \ddagger$	Comments
507.4 7	85 7	1095.5	3/2 ⁻	588.0	1/2 ⁻			$\alpha(K)=0.0401$ 6; $\alpha(L)=0.00544$ 8; $\alpha(M)=0.000960$ 14; $\alpha(N+..)=0.0001429$ 21
588.0 2	100	588.0	1/2 ⁻	0.0	9/2 ⁺	(M4)	0.0466	$\alpha(N)=0.0001343$ 19; $\alpha(O)=8.60 \times 10^{-6}$ 13
^x 650.3 8	0.8 9							Uncertain γ ray. Placement from a tentative 1745 level by 1969HaZP.
769.6 5	6.5 6	1865.1	3/2 ⁻	1095.5	3/2 ⁻			
1277.5 15	1.6 5	1865.1	3/2 ⁻	588.0	1/2 ⁻			

\dagger For absolute intensity per 100 decays, multiply by 0.9557 13.

\ddagger Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

^x γ ray not placed in level scheme.

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Legend

Intensities: I_γ per 100 parent decays