

^{50}Ni ε decay (18.5 ms) 2007Do17

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh		NDS 157, 1 (2019)	15-Apr-2019

Parent: ^{50}Ni : $E=0$; $J^\pi=0^+$; $T_{1/2}=18.5$ ms 12; $Q(\varepsilon)=13449$ 48; $\% \varepsilon + \% \beta^+$ decay=100.0

^{50}Ni - $T_{1/2}$: from 2007Do17, measured by time correlation of implantation events due to ^{50}Ni and subsequent emission of protons.

^{50}Ni - $Q(\varepsilon)$: From mass excess of -17585 41 for ^{50}Co and -4136 25 for ^{50}Ni (2007Do17, IMME analysis). Other: 13510 640 (syst, 2017Wa10).

2007Do17: fragmentation reaction used to produce ^{50}Ni isotope at SISSE/LISE3 facility in GANIL. Primary beam: $^{58}\text{Ni}^{26+}$ at 74.5 MeV/nucleon; target=natural Ni. Fragment separator= α -LISE3. Identification by energy loss, residual energy and time-of-flight measurements using two micro-channel plate (MCP) detectors and Si detectors. Double-sided silicon-strip detectors (DSSSD) and a thick Si(Li) detector were used to detect implanted events, charged particles and β particles. γ rays were detected by Ge detectors. Coincidences measured between charged particles, β rays and γ rays.

 ^{50}Co Levels

E(level)	J^π [†]	Comments
170+x		E(level): S(p)(^{50}Co)+x, where x<13280 400 from $Q(\varepsilon)(^{50}\text{Ni})$ -S(p)(^{50}Co), S(p)(^{50}Co)=170 400 (syst, 2017Wa10).
4835 47	(0) ⁺	$\%p=100$ E(level): decays by delayed two-proton mode to ^{48}Mn . Level energy is determined from the measured proton energy of 1972 13 (2007Do17) and mass excesses of -29300 18 (2007Do17, from IAS energy and γ cascade in ^{48}Mn and -17585 41 (2007Do17, from isobaric multiplet mass equation,IMME) for ^{48}Mn and ^{50}Co ground states, respectively. Using S(2p)(^{50}Co)=2910 400 (syst, 2017Wa10) and the measured proton energy 1972 13 (2007Do17), IAS energy=4882 400.

[†] From the Adopted Levels.

 ε, β^+ radiations

E(decay)	E(level)	$I\beta^+$ [†]	$I\varepsilon$ [†]	Log ft	$I(\varepsilon + \beta^+)$ [†]	Comments
(8.61×10^3 7)	4835	14 5	0.015 5	3.42 16	14 5	av $E\beta=3585$ 34; $\varepsilon K=0.00094$ 3; $\varepsilon L=0.000101$ 3; $\varepsilon M+=1.75 \times 10^{-5}$ 5
(7×10^3 ‡ 7)	170+x				73 6	$I(\varepsilon + \beta^+)$: intensity associated with εp decay, deduced from $\% \varepsilon p + \% \varepsilon 2p = 86.7$ 39 and $\% \varepsilon 2p = 14$ 5 (2007Do17).

[†] Absolute intensity per 100 decays.

[‡] Estimated for a range of levels.