^{50}Co ε decay (38.8 ms) 2007Do17,1996Fa09

History

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

Parent: ^{50}Co: E=0; $J^\pi=(6^+)$; $T_{1/2}$=38.8 ms *2*; Q(ε)=16895 *73*; %ε+%$β^+$ decay=100.0

^{50}Co-Q(ε): Deduced using mass excess=−17585 *41* for ^{50}Co from IMME analysis (2007Do17). Other: 16850 *400* (syst, 2017Wa10).

^{50}Co-$T_{1/2}$: Measured by 2007Do17.

^{50}Co-%ε+%$β^+$ decay: %εp=70.5 *7* (2007Do17).

2007Do17: fragmentation reaction used to produce ^{50}Ni isotope at SISSE/LISE3 facility in GANIL. Primary beam: $^{58}Ni^{26+}$ 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.

1996Fa09: experiment at FRS in GSI. Fragmentation reaction with ^{58}Ni primary beam of 650 MeV/nucleon and beryllium target. Identification by TOF, position information, magnetic field values and energy loss. Implantation into a Si telescope of 7 detectors. Coincidences between fragments and protons.

Data are from 2007Do17, unless otherwise stated.

^{50}Fe Levels

E(level)	J^π[†]	Comments
0.0	0^+	
764.8 *3*	2^+	
1851.4 *8*	(4^+)	
3159.2 *9*	(6^+)	
4145+x		E(level): S(p)(^{50}Fe)+x, where x<12750 *75* from Q(ε)(^{50}Co)-S(p)(^{50}Fe), S(p)(^{50}Fe)=4145 *9* (2017Wa10).
8458 *15*	(6^+)	%p=100 E(level): from E(p)(c.m.)=2772 *12*, S(p)(^{50}Fe)=4145 *9* (2017Wa10) and E(^{49}Mn, $11/2^-$)=1541.31 *25* (from Adopted Levels for ^{49}Mn in ENSDF database). E(p)(c.m.)=2772 *12* is the weighted average of E(p)=2790 *41* (1996Fa09), E(p)=2770 *12* (2007Do17). E(level): identified as IAS of (6^+) g.s. of ^{50}Co based on strong ε decay to this level with log *ft*=3.32.

[†] From the Adopted Levels.

ε,$β^+$ radiations

E(decay)	E(level)	Iβ$^+$ [‡]	Iε[‡]	Log *ft*[†]	I(ε+$β^+$)[‡]	Comments
(8.44×10^3 *8*)	8458	42.1 *24*	0.0358 *23*	3.32 *3*	42.1 *24*	av Eβ=3686 *32*; εK=0.000757 *19*; εL=8.02×10^{-5} *20*; εM+=1.40×10^{-5} *4* I(ε+$β^+$): from delayed proton intensity (2007Do17).
(6×10$^{3\#}$ *6*)	4145+x				28.4 *25*	I(ε+$β^+$): intensity associated with εp decay, deduced from total %εp=70.5 *7* and %εp=42.1 *24* to 8463 level (2007Do17).
(1.374×10^4 *7*)	3159.2	15 *3*	0.0030 *6*	4.78 *9*	15 *3*	av Eβ=6127 *37*; εK=0.000178 *3*; εL=1.88×10^{-5} *4*; εM+=3.28×10^{-6} *6* I(ε+$β^+$): treated by the evaluators as an upper limit since there could be some possible γ feeding from higher levels.

[†] Deduced assuming ΔQ(ε)=180 keV.

[‡] Absolute intensity per 100 decays.

[#] Estimated for a range of levels.

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γ(^{50}Fe)

E_γ	I_γ †	E_i(level)	J_i^π	E_f	J_f^π
764.8 *3*	24 *4*	764.8	2^+	0.0	0^+
1086.6 *7*	11 *5*	1851.4	(4^+)	764.8	2^+
1307.8 *5*	15 *3*	3159.2	(6^+)	1851.4	(4^+)

† Absolute intensity per 100 decays.

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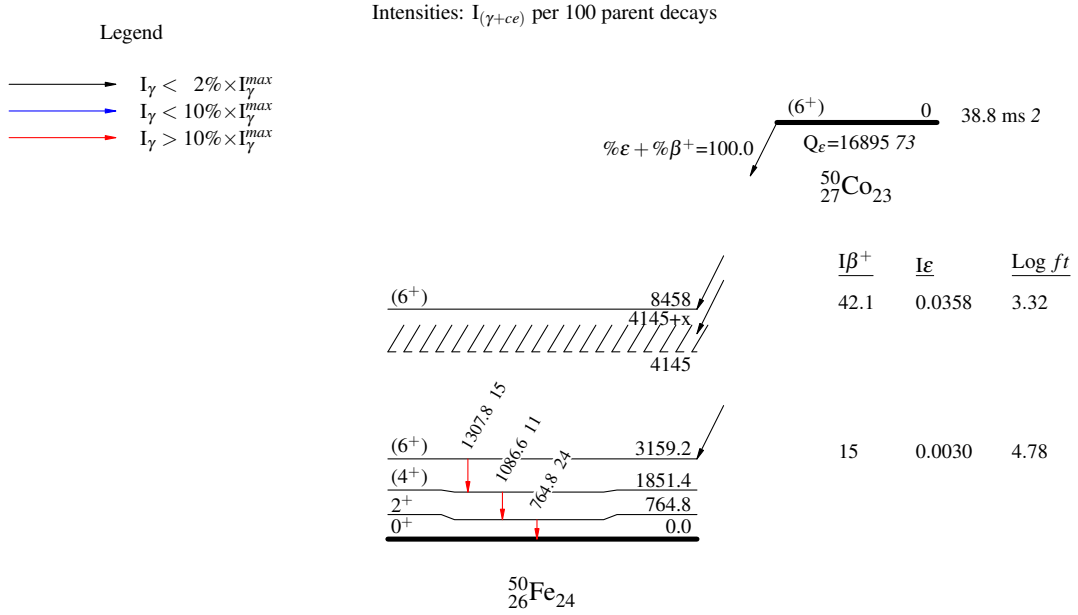
Decay Scheme

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



	Iβ+	Iε	Log *ft*
	42.1	0.0358	3.32
	15	0.0030	4.78