

${}^{49}\text{Fe}$   $\beta^+$ p decay **2007Do17,1996Fa09**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 179, 1 (2022)	30-Nov-2021

Parent:  ${}^{49}\text{Fe}$ :  $E=0.0$ ;  $J^\pi=(7/2^-)$ ;  $T_{1/2}=64.7$  ms 3;  $Q(\beta^+p)=10782$  25;  $\% \beta^+p$  decay=56.7 4

${}^{49}\text{Fe}$ - $J^\pi, T_{1/2}$ : From Adopted Levels of  ${}^{49}\text{Fe}$  in ENSDF database (2008Bu17).

${}^{49}\text{Fe}$ - $Q(\beta^+p)$ : From 2021Wa16.

${}^{49}\text{Fe}$ - $\% \beta^+p$  decay: From 2007Do17. Other:  $\geq 52$  10 (1996Fa09, sum of all observed proton branches).

2007Do17:  ${}^{49}\text{Fe}$  source was produced via fragmentation of  $74.5$   ${}^{58}\text{Ni}$  from SISSI-LISE3 facility of GANIL on a  $250$  mg/cm<sup>2</sup> natural Ni target. Fragment were selected by the ALPHA-LISE3 separator by energy loss, residual energy and time-of-flight using two micro-channel plate (MCP) detectors and Si detectors, and were implanted into double-sided silicon-strip detectors (DSSSD) and a thick Si(Li) detector for detecting implanted events, charged particles and  $\beta$  particles.  $\gamma$  rays were detected by four Ge detectors. Measured  $E_\gamma$ ,  $I_\gamma$ ,  $E(p)$ ,  $I(p)$ , particle- $\gamma$ -coin, implant-p time correlation. Deduced parent  $T_{1/2}$  and total proton branching ratio.

1996Fa09:  ${}^{49}\text{Fe}$  source ions were produced via  ${}^9\text{Be}({}^{58}\text{Ni}, X)$  with  $E=650$  MeV/nucleon  ${}^{58}\text{Ni}$  beam from the SIS synchrotron on a  $6019$  mg/cm<sup>2</sup> beryllium target. Fragments were separated with the FRS separator by magnetic-rigidity, energy-loss (MUSIC: two ionization chambers) and time-of-flight (plastic scintillators), and implanted in an adjustable energy degrader followed by a silicon-detector telescope for detecting the decay products. Measured  $\beta$ -delayed proton spectrum, decay curve. Deduced levels,  $T_{1/2}$ , delayed proton branching ratios.

Other: 2002Pf03 and 1970Ce02. See also 1993Bu04.

 ${}^{48}\text{Cr}$  Levels

E(level) <sup>†</sup>	$J^\pi$ <sup>‡</sup>	$T_{1/2}$ <sup>‡</sup>	Comments
0.0	0 <sup>+</sup>	21.56 h 3	$\% \epsilon + \% \beta^+ = 100$
752.21 20	2 <sup>+</sup>		
1857.4 7	4 <sup>+</sup>		

<sup>†</sup> From  $E_\gamma$  data.

<sup>‡</sup> From Adopted Levels.

 $\gamma({}^{48}\text{Cr})$ 

$E_\gamma$ <sup>†</sup>	$I_\gamma$ <sup>†#</sup>	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Mult. <sup>‡</sup>
752.2 2	52 4	752.21	2 <sup>+</sup>	0.0	0 <sup>+</sup>	E2
1105.2 6	3.1 7	1857.4	4 <sup>+</sup>	752.21	2 <sup>+</sup>	E2

<sup>†</sup> From 2007Do17.

<sup>‡</sup> From Adopted Gammas.

# Absolute intensity per 100 decays.

Delayed Protons ( ${}^{48}\text{Cr}$ )

E(p) <sup>†</sup>	E( ${}^{48}\text{Cr}$ )	I(p) <sup>†#</sup>	E( ${}^{49}\text{Mn}$ ) <sup>‡</sup>	Comments
1321 24		0.2 1		
1122 40	752.21	1.2 2	3962	E(p): unweighted average of 1161 17 (2007Do17) and 1083 16 (1996Fa09). I(p): other: 4 1 (1996Fa09).
1544 23	752.21	1.4 2	4384	E(p): weighted average of 1550 23 (2007Do17) and 1538 24 (1996Fa09). I(p): other: 5 1 (1996Fa09).
1976 16	752.21	34.5 2	4816	E(p): weighted average of 1977 16 (2007Do17), 1978 29 (1996Fa09), and 1960 50

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${}^{49}\text{Fe}$   $\beta^+$  p decay    [2007Do17](#), [1996Fa09](#) (continued)

Delayed Protons ( ${}^{48}\text{Cr}$ ) (continued)

† From [2007Do17](#), unless otherwise noted. The proton energies are in the center-of-mass system.

‡ Deduced from  $E(p)$ ,  $E({}^{48}\text{Cr}$  level) and  $S(p)({}^{49}\text{Mn})=2088.8$  ([2021Wa16](#)).

# Absolute intensity per 100 decays.

**${}^{49}\text{Fe}$   $\beta^+$ p decay 2007Do17,1996Fa09**Decay Scheme $\gamma$  Intensities:  $I_{(\gamma+ce)}$  per 100 parent decays

I(p) Intensities: I(p) per 100 parent decays

