## $^{49}$Fe $\beta^+$ decay: partial 1996Fa09,2007Do17

History

| Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | T. W. Burrows[a] | NDS 109, 1879 (2008) | 14-Jul-2008 |

Parent: $^{49}$Fe: E=0.0; $J^\pi$=(7/2$^-$); $T_{1/2}$=64.7 ms *3*; Q($\beta^+$)=16895 *73*; %$\beta^+$ decay=100.0

$^{49}$Fe-E,$J^\pi$,$T_{1/2}$: From the $^{49}$Fe Adopted Levels.

$^{49}$Fe-Q($\beta^+$): From 2007Do17. Other: 13.03 MeV *15* (2003Au03. Systematics).

$^{49}$Fe-%$\beta^+$ decay: %$\beta^+$p=56.7 *4* from the $^{49}$Fe Adopted Levels.

1996Fa09: $^9$Be($^{58}$Ni,X) E=650 MeV/nucleon. Measured projectile-like fragments At 0°, fragment recoil separator; mag spect, ΔE/E counter telescope (Si), tof.

2007Do17: Ni($^{58}$Ni,X) E=74.5 MeV/nucleon. ALPHA-LISE3 fragment separator. Fragment identification by energy loss, residual energy and tof 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 $\beta$ particles. $\gamma$'s detected by four Ge detectors. Coincidences measured between charged particles and $\gamma$'s. $T_{1/2}$ measured by time correlation of implantation events due to $^{49}$Mn and subsequent emission of protons and $\gamma$'s.

Others: 1970Ce02. See also 1995Bu23.

### $^{49}$Mn Levels

| E(level)[†] | $J^\pi$[‡] | $T_{1/2}$[‡] | Comments |
|---|---|---|---|
| 0.0 | 5/2$^-$ | 382 ms *7* | %$\varepsilon$+%$\beta^+$=100<br>%$\varepsilon$+%$\beta^+$: from the Adopted Levels. |
| 261.50 *10* | 7/2$^{(-)}$ | | |
| 1058.60 *14* | 9/2$^{(-)}$ | | |
| 1540.4 *4* | 11/2$^{(-)}$ | | |
| 3959 *50* | (5/2$^-$) | | %p=100 (1996Fa09,2007Do17)<br>E(level): from S(p)=2085 keV *25*, E(p)=1521 keV *46* (unweighted av. Of 1083 keV *16* (1996Fa09) and 1161 keV *17* (2007Do17)), and E($^{48}$Cr level)=752 (evaluator). |
| 4381 *17* | (7/2$^-$,5/2$^-$) | | %p=100 (1996Fa09,2007Do17)<br>E(level): from S(p)=2085 *25*, E(p)=1544 keV *17* (weighted av. (INT.) of 1538 keV *24* (1996Fa09) and 1550 keV *23* (2007Do17)), and E($^{48}$Cr level)=752 (evaluator). |
| 4814 *29* | (7/2$^-$) | | %p=100 (1996Fa09,2007Do17)<br>IAS In $^{49}$Mn (2007Do17).<br>E(level): from S(p)=2085 *25*, E(p)=1977 keV *14* (weighted av. (INT.) of 1978 keV *29* (1996Fa09) and 1977 keV *16* (2007Do17), and E($^{48}$Cr level)=752 (evaluator). |

[†] From least-squares fit to E$\gamma$'s (evaluator).
[‡] From the Adopted Levels.

### $\varepsilon$,$\beta^+$ radiations

| E(decay) | E(level) | I$\beta^+$[‡] | I$\varepsilon$[‡] | Log *ft* | I($\varepsilon+\beta^+$)[†‡] | Comments |
|---|---|---|---|---|---|---|
| (1.208×10$^4$ *8*) | 4814 | 34.5 *2* | 0.00900 *22* | 4.36 *2* | 34.5 *2* | av E$\beta$=5304 *39*; $\varepsilon$K=0.000232 *5*; $\varepsilon$L=2.43×10$^{-5}$ *6*; $\varepsilon$M+=4.24×10$^{-6}$ *9*<br>I($\varepsilon+\beta^+$): from 2007Do17. Other: 43 *10* (1996Fa09). |
| (1.251×10$^4$ *8*) | 4381 | 1.4 *2* | | 5.83 *7* | 1.4 *2* | av E$\beta$=5520 *38*<br>I($\varepsilon+\beta^+$): from 2007Do17. Other: 5 *1* (1996Fa09). |
| (1.294×10$^4$ *9*) | 3959 | 1.2 *2* | | 5.97 *8* | 1.2 *2* | av E$\beta$=5730 *44*<br>I($\varepsilon+\beta^+$): from 2007Do17. Other: 4 *1* (1996Fa09). |

[†] From delayed proton intensity.
[‡] Absolute intensity per 100 decays.

## $^{49}$Fe $\beta^+$ decay: partial 1996Fa09,2007Do17 (continued)

### $\gamma(^{49}Mn)$

All data are from 2007Do17.

| $E_\gamma$ | $I_\gamma$ † | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ |
|---|---|---|---|---|---|
| 261.5 *1* | 51 *5* | 261.50 | $7/2^{(-)}$ | 0.0 | $5/2^-$ |
| 481.9 *5* | 10.3 *35* | 1540.4 | $11/2^{(-)}$ | 1058.60 | $9/2^{(-)}$ |
| 797.1 *1* | 23.7 *23* | 1058.60 | $9/2^{(-)}$ | 261.50 | $7/2^{(-)}$ |
| 1278.7 *6* | 7.8 *14* | 1540.4 | $11/2^{(-)}$ | 261.50 | $7/2^{(-)}$ |

† Absolute intensity per 100 decays.

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### Decay Scheme

Intensities: $I_\gamma$ per 100 parent decays