

$^{55}\text{Mn}(\alpha, \text{pn}\gamma)$ E=25,28.6 MeV 1985Ba16

| Type | Author | History Citation | Literature Cutoff Date |
|-----------------|------------|--------------------|------------------------|
| Full Evaluation | M. R. Bhat | NDS 85, 415 (1998) | 24-Sep-1998 |

Target $J^\pi=5/2^-$. Measured γ 's ($\theta=90^\circ, 125^\circ$); Ge(Li). $T_{1/2}$ by DSAM (centroid).

 ^{57}Fe Levels

| E(level) | J^π † | $T_{1/2}$ | Comments |
|----------|----------------|-----------------|---|
| 0.0 | $1/2^-$ | | |
| 14.3 | $3/2^-$ | | |
| 136.4 | $5/2^-$ | | |
| 366.8 | $3/2^-$ | | |
| 706.3 | $5/2^-$ | | |
| 1007.0 | $7/2^-$ | 0.13 ps 7 | $T_{1/2}$: correction applied for 870.4 γ (^{57}Co) contamination. |
| 1197.8 | $9/2^-$ | | |
| 1356.8 | $7/2^-$ | 0.18‡ ps 7 | |
| 1989.4 | $9/2^-$ | | |
| 2355.7 | $(11/2)^-$ | 0.06 ps 2 | |
| 2455.2 | $9/2^{+\#}$ | >1.4 ps | |
| 2878.5 | $(13/2)^-$ | | |
| 3134.5 | $(15/2)^-$ | | |
| 3269.1 | $(13/2)^{+\#}$ | 0.37‡ ps +2I-10 | $T_{1/2}$: strong feeding time effects may explain difference in τ from ($^{13}\text{C}, 4n\gamma$) result. |
| 4525.2 | $(17/2)^{+\#}$ | 0.19‡ ps 6 | $T_{1/2}$: apparent τ , uncorrected for side feeding, is closer to the result from ($^{13}\text{C}, 4n\gamma$). |
| 6185.6 | $(21/2)^{+\#}$ | 0.11 ps 4 | |
| 8324.6 | $(25/2)^{+\#}$ | <0.14 ps | |

† From Adopted Levels.

‡ Correction applied for side feeding.

Configuration= $(^{56}\text{Fe } 0^+)(\nu 1g_{9/2})$ based on suggestion by 1978Na06 and present results.

 $\gamma(^{57}\text{Fe})$

| E_γ | I_γ † | E_i (level) | J_i^π | E_f | J_f^π |
|------------|--------------|---------------|------------|--------|------------|
| 122.1 | 100 10 | 136.4 | $5/2^-$ | 14.3 | $3/2^-$ |
| 136.4 | 13.0 13 | 136.4 | $5/2^-$ | 0.0 | $1/2^-$ |
| 230.3# | <1 | 366.8 | $3/2^-$ | 136.4 | $5/2^-$ |
| 256.0 | 32.7 33 | 3134.5 | $(15/2)^-$ | 2878.5 | $(13/2)^-$ |
| 339.6# | <1 | 706.3 | $5/2^-$ | 366.8 | $3/2^-$ |
| 352.5 | 7.8 12 | 366.8 | $3/2^-$ | 14.3 | $3/2^-$ |
| 366.7 | 1.5 2 | 366.8 | $3/2^-$ | 0.0 | $1/2^-$ |
| 570.1 | 2.7 4 | 706.3 | $5/2^-$ | 136.4 | $5/2^-$ |
| 640.1 | 2.5 4 | 1007.0 | $7/2^-$ | 366.8 | $3/2^-$ |
| 650.5 | 9.2 14 | 1356.8 | $7/2^-$ | 706.3 | $5/2^-$ |
| 692.0 | 20.8 21 | 706.3 | $5/2^-$ | 14.3 | $3/2^-$ |
| 706.3# | <1 | 706.3 | $5/2^-$ | 0.0 | $1/2^-$ |
| 791.6 | 1.4 2 | 1989.4 | $9/2^-$ | 1197.8 | $9/2^-$ |
| 814.1 | 11.3 11 | 3269.1 | $(13/2)^+$ | 2455.2 | $9/2^+$ |
| 870.6 | 39 4 | 1007.0 | $7/2^-$ | 136.4 | $5/2^-$ |
| 913.4 | 20.6 21 | 3269.1 | $(13/2)^+$ | 2355.7 | $(11/2)^-$ |
| 982.4 | 5.7 9 | 1989.4 | $9/2^-$ | 1007.0 | $7/2^-$ |
| 992.4 | 24.6 25 | 1007.0 | $7/2^-$ | 14.3 | $3/2^-$ |

Continued on next page (footnotes at end of table)

$^{55}\text{Mn}(\alpha, \text{pn}\gamma) E=25,28.6 \text{ MeV}$ **1985Ba16** (continued) $\gamma(^{57}\text{Fe})$ (continued)

| E_γ | I_γ^\dagger | $E_i(\text{level})$ | J_i^π | E_f | J_f^π |
|---------------------|----------------------|---------------------|------------|--------|------------|
| 1061.4 | 91 9 | 1197.8 | $9/2^-$ | 136.4 | $5/2^-$ |
| 1158.1 | 11.6 [‡] 12 | 2355.7 | $(11/2)^-$ | 1197.8 | $9/2^-$ |
| 1256.1 | 24.4 25 | 4525.2 | $(17/2^+)$ | 3269.1 | $(13/2)^+$ |
| 1283.1 [#] | <1 | 1989.4 | $9/2^-$ | 706.3 | $5/2^-$ |
| 1348.5 | 28.6 [‡] 29 | 2355.7 | $(11/2)^-$ | 1007.0 | $7/2^-$ |
| 1448.2 | 15.2 15 | 2455.2 | $9/2^+$ | 1007.0 | $7/2^-$ |
| 1660.4 | 11.0 11 | 6185.6 | $(21/2^+)$ | 4525.2 | $(17/2^+)$ |
| 1680.7 | 58 6 | 2878.5 | $(13/2)^-$ | 1197.8 | $9/2^-$ |
| 2139.0 | 6 1 | 8324.6 | $(25/2^+)$ | 6185.6 | $(21/2^+)$ |

[†] Relative photon intensity at 28.6 MeV and 125°.

[‡] Branching ratios agree with data in $(\alpha, n\gamma)$ but disagree with results in $(^{13}\text{C}, 4n\gamma)$.

[#] Placement of transition in the level scheme is uncertain.

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Legend

Level Scheme

Intensities: Relative photon intensity At 28.6 MeV and 125°

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$
- - - - -→ γ Decay (Uncertain)

