## $^{12}C(^{40}Ca,2np\gamma)$ 1990Ca06

History

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

1990Ca06: E=160 MeV. Measured $\gamma$'s, recoil-$\gamma(\theta$=40°, 101°, 117°, 142.5°), recoil-$\gamma$ coin, and recoil-$\gamma\gamma$ coin; Compton-suppressed Ge, recoil separator.

2005LiZX: E=230 MeV. Measured $\gamma$'s and (recoil)$\gamma$-coin; FMA stand-alone experiment with one clover $\gamma$-ray detector At 90° to the beam direction. FMA focal-plane detectors consisted of micro-channel plate detectors for determination of position and ionization chamber for Z-identification through energy loss and total energy of the recoils. Test experiment to investigate if a study of $^{49}$Fe spectroscopy is feasible.

### $^{49}$Mn Levels

| E(level)[†] | $J^\pi$[‡] |
|---|---|
| 0.0 | $5/2^-$[#] |
| 261.0 *2* | $7/2^-$ |
| 1059.0 *3* | $9/2^-$ |
| 1541.0 *4* | $11/2^-$ |
| 2481.0 *4* | $13/2^-$ |
| 3189.0 *8* | $15/2^-$ |
| 4250.0 *9* | $17/2^-$ |
| 4446.0 *10* | $19/2^-$ |
| 6056.1 *14* | $(23/2^-)$[#] |

[†] From least-squares fit to E$\gamma$'s (evaluator).
[‡] From recoil-$\gamma(\theta)$ and mirror symmetry with $^{49}$Cr, except As noted.
[#] From the Adopted Levels.

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

| $E_\gamma$[†] | $I_\gamma$ | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult.[‡] |
|---|---|---|---|---|---|---|
| 196 *1* | 4 | 4446.0 | $19/2^-$ | 4250.0 | $17/2^-$ | D[@] |
| 261.0[#] *2* | 100 | 261.0 | $7/2^-$ | 0.0 | $5/2^-$ | D[@] |
| 482.0[#] *2* | 42 | 1541.0 | $11/2^-$ | 1059.0 | $9/2^-$ | D[@] |
| 708[#] *1* | 31 | 3189.0 | $15/2^-$ | 2481.0 | $13/2^-$ | D[@] |
| 798.0[#] *2* | 60 | 1059.0 | $9/2^-$ | 261.0 | $7/2^-$ | D[@] |
| 940.0[#] *2* | 44 | 2481.0 | $13/2^-$ | 1541.0 | $11/2^-$ | D[@] |
| 1059[a] *1* | <3 | 1059.0 | $9/2^-$ | 0.0 | $5/2^-$ | |
| 1060 *1* | 15 | 4250.0 | $17/2^-$ | 3189.0 | $15/2^-$ | D[@] |
| 1257[#] *1* | 32 | 4446.0 | $19/2^-$ | 3189.0 | $15/2^-$ | D,Q[&] |
| 1280[#] *1* | 41 | 1541.0 | $11/2^-$ | 261.0 | $7/2^-$ | D,Q[&] |
| 1422 *1* | 9 | 2481.0 | $13/2^-$ | 1059.0 | $9/2^-$ | D,Q[&] |
| 1610[#] *1* | 18 | 6056.1 | $(23/2^-)$ | 4446.0 | $19/2^-$ | D,Q |
| 1647 *1* | 21 | 3189.0 | $15/2^-$ | 1541.0 | $11/2^-$ | D,Q[&] |
| 1770 *1* | 8 | 4250.0 | $17/2^-$ | 2481.0 | $13/2^-$ | D,Q[&] |

[†] From 1990Ca06. Precision of $\gamma$ energies ranges from 0.2 keV for strong low-energy gammas to 1 keV for E$\gamma$>1 MeV.
[‡] From recoil-$\gamma(\theta)$.
[#] Also reported by 2005LiZX.

Continued on next page (footnotes at end of table)

**$^{12}$C($^{40}$Ca,2np$\gamma$) 1990Ca06 (continued)**

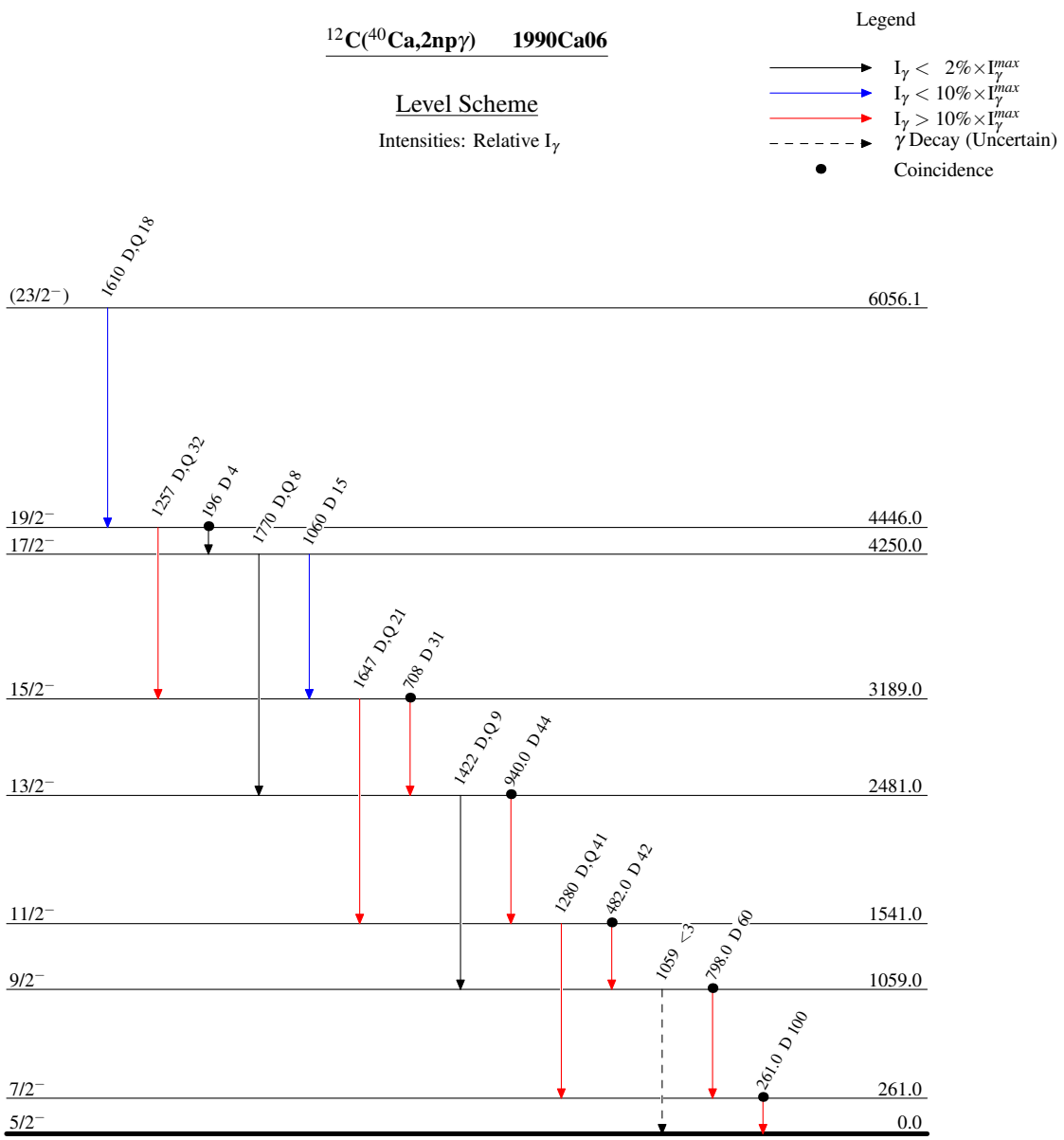
$\gamma(^{49}Mn)$ (continued)

@ Stretched dipole ($\Delta J=1$) transition.
& Stretched quadrupole ($\Delta J=2$) or $\Delta J=0$ dipole transition.
a Placement of transition in the level scheme is uncertain.

**$^{12}$C($^{40}$Ca,2npγ) 1990Ca06**

Level Scheme

Intensities: Relative $I_\gamma$




$^{49}_{25}Mn_{24}$