## $^{24}$Mg($^{54}$Fe,2n$\gamma$)    **2001Fi13**

### History

| Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | Balraj Singh, Jun Chen and Ameenah R. Farhan | NDS 194,3 (2024) | 8-Jan-2024 |

2001Fi13 (also 2001Fi05): E=180 MeV. Measured E$\gamma$, I$\gamma$, $\gamma\gamma$ using GAMMASPHERE array consisting of 101 HPGe detectors and Fragment Mass Analyzer.

1990Li25: $^{24}$Mg($^{54}$Fe,2n$\gamma$) E=175 MeV and $^{40}$Ca($^{40}$Ca,2p2n$\gamma$) E=135 MeV. Measured $\gamma$, $\gamma\gamma$, recoil $\gamma$ coin, neutron $\gamma$ coin.
First 2$^+$ level in $^{76}$Sr proposed at 260.9 keV in this study. Two other $\gamma$ rays of 484 and 700 keV were seen, which in later work of 2001Fi13 were assigned from the 4$^+$ and 6$^+$ members, respectively of the ground-state band.

1988NaZO: $^{24}$Mg($^{54}$Fe,2n$\gamma$) E=175 MeV, measured yield.

Additional information 1.

### $^{76}$Sr Levels

The 7468- and 9134-keV levels are omitted in Adopted Levels, as the $\gamma$ rays from these levels are not confirmed in later study (2007Da04).

| E(level)$^†$ | J$^{\pi\,‡}$ |
|---|---|
| 0.0$^#$ | 0$^+$ |
| 261.5$^#$ *3* | 2$^+$ |
| 744.7$^#$ *5* | 4$^+$ |
| 1442.6$^#$ *7* | 6$^+$ |
| 2335.9$^#$ *9* | 8$^+$ |
| 3402.9$^#$ *13* | 10$^+$ |
| 4620.9$^#$ *17* | 12$^+$ |
| 5969.9$^#$ *20* | 14$^+$ |
| 7468?$^#$ *3* | 16$^+$ |
| 9134?$^#$ *4* | 18$^+$ |

$^†$ From E$\gamma$ data.
$^‡$ As proposed in 2001Fi13 based on band assignments. When considered in Adopted Levels, those assignments of excited states will be placed in parentheses if there are no supporting experimental evidences.
$^#$ Band(A): g.s. band.

### $\gamma$($^{76}$Sr)

| E$_\gamma\,^†$ | I$_\gamma\,^†$ | E$_i$(level) | J$_i^\pi$ | E$_f$ | J$_f^\pi$ | Mult.$^@$ | Comments |
|---|---|---|---|---|---|---|---|
| 261.5$^‡$ *3* | 100 | 261.5 | 2$^+$ | 0.0 | 0$^+$ | (Q) | E$_\gamma$: 260.9 *2* (1990Li25) placed from first 2$^+$ state. |
| 483.2$^‡$ *3* | 76 *6* | 744.7 | 4$^+$ | 261.5 | 2$^+$ | (Q) | E$_\gamma$: 484, unplaced $\gamma$ (1990Li25). |
| 697.9$^‡$ *5* | 67 *11* | 1442.6 | 6$^+$ | 744.7 | 4$^+$ | (Q) | E$_\gamma$: 700, unplaced $\gamma$ (1990Li25). |
| 893.3$^‡$ *5* | 33 *6* | 2335.9 | 8$^+$ | 1442.6 | 6$^+$ | (Q) | |
| 1067$^‡$ *1* | 33 *8* | 3402.9 | 10$^+$ | 2335.9 | 8$^+$ | | |
| 1218 *1* | 21 *6* | 4620.9 | 12$^+$ | 3402.9 | 10$^+$ | | |
| 1349 *1* | 21 *8* | 5969.9 | 14$^+$ | 4620.9 | 12$^+$ | | |
| 1498 *2* | 15 *8* | 7468? | 16$^+$ | 5969.9 | 14$^+$ | | E$_\gamma$: $\gamma$ not observed in 2007Da04 using a different reaction. 2007Da04 suggest that it may depopulate a level in a sideband. It is not included in Adopted Gammas. |
| 1666$^{#\&}$ | <10 | 9134? | 18$^+$ | 7468? | 16$^+$ | | |

Continued on next page (footnotes at end of table)

$^{24}$Mg($^{54}$Fe,2n$\gamma$)    **2001Fi13 (continued)**
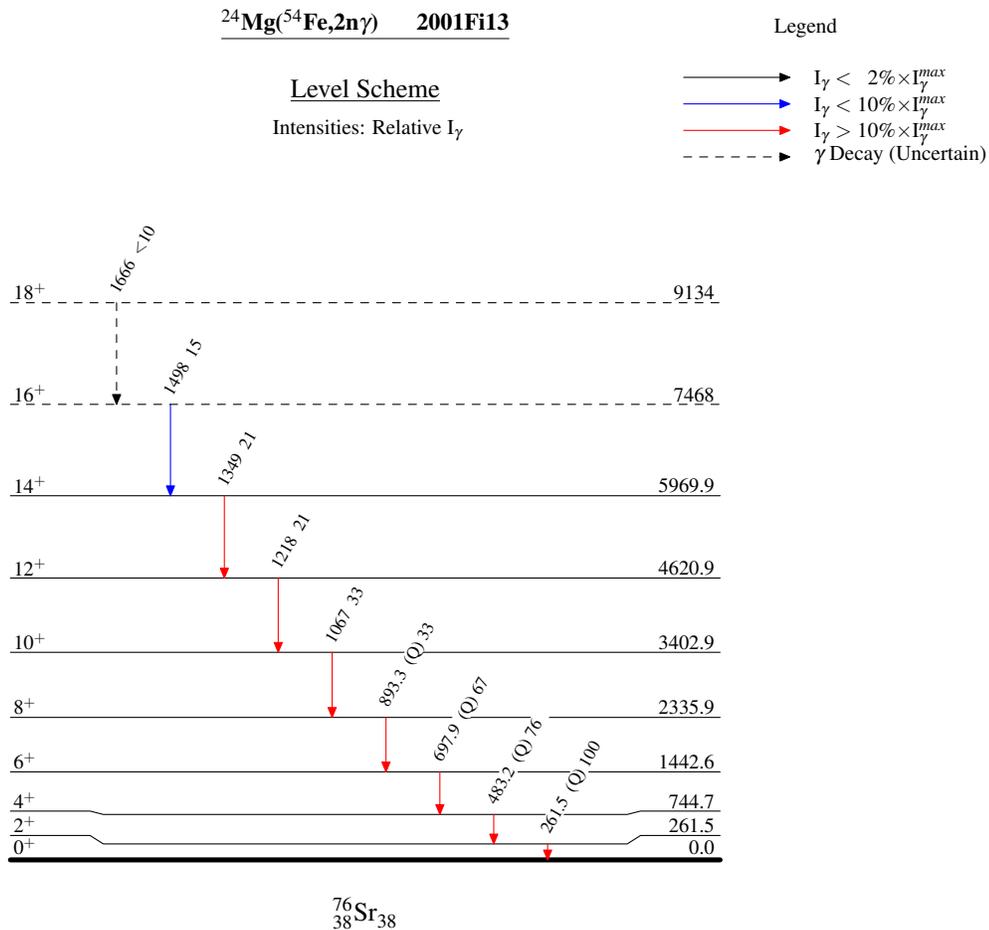
$\gamma(^{76}$Sr) (continued)
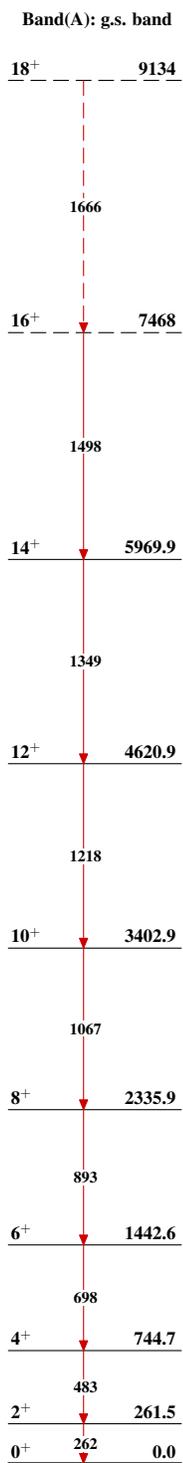
† From 2001Fi13.

‡ Measured $\gamma(\theta)$ consistent with stretched quadrupole transition.

# This tentative $\gamma$ in 2001Fi13 is not confirmed in 2007Da04, thus omitted in Adopted Levels, Gammas dataset.

@ The $\gamma(\theta)$ are consistent with $\Delta J=2$, quadrupole (2001Fi13), but the authors do not provide values of angular distribution coefficients.

& Placement of transition in the level scheme is uncertain.

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Level Scheme

Intensities: Relative $I_\gamma$

Legend

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



$^{76}_{38}Sr_{38}$

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**Band(A): g.s. band**

| | | |
|---|---|---|
| 18$^+$ | | 9134 |
| | 1666 | |
| 16$^+$ | | 7468 |
| | 1498 | |
| 14$^+$ | | 5969.9 |
| | 1349 | |
| 12$^+$ | | 4620.9 |
| | 1218 | |
| 10$^+$ | | 3402.9 |
| | 1067 | |
| 8$^+$ | | 2335.9 |
| | 893 | |
| 6$^+$ | | 1442.6 |
| | 698 | |
| 4$^+$ | | 744.7 |
| | 483 | |
| 2$^+$ | 262 | 261.5 |
| 0$^+$ | | 0.0 |

$^{76}_{38}$Sr$_{38}$