

$^{52}\text{Cr}(\text{p},\text{n}\gamma)$ 1973De03, 1976Ta14

| Type | Author | History | Citation | Literature Cutoff Date |
|-----------------|----------------------|---------|---------------------|------------------------|
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1973De03: E=8.0-10.0 MeV; measured $E\gamma$, $I\gamma$, $n\gamma$ coin, 40 cm³ coaxial Ge(Li) detector (FWHM=3 keV), 5-in diam*3-in cylindrical ≠ 213 liquid scintillator.

1976Ta14: E=6.3-7.3 MeV; measured $\gamma(\theta)$, 42 cm³ Ge(Li) detector rotated to 0°, 31°, 55°, 70° and 90° with respect to the proton beam direction.

Level scheme from 1973De03.

 ^{52}Mn Levels

| E(level) | J^π † | Comments |
|-----------|----------------|---|
| 0.0 | 6 ⁺ | |
| 378.1 5 | 2 ⁺ | |
| 546.4 6 | 1 ⁺ | |
| 731.8 4 | 4 | J^π : $\gamma(\theta)$ for g.s. transition implies $J=4-8$, 354-keV transition implies $J=0-4$. |
| 825.5 6 | 2,3 | |
| 869.7 5 | | J^π : high spin (based on excitation function) (1976Ta14). |
| 884.4 5 | 3,4 | |
| 887.1 6 | 2 | |
| 1232.5 5 | 2,3,4 | |
| 1253.7 4 | 4,5,6 | |
| 1279.2 5 | | |
| 1647.2 6 | | |
| 1683.9 4 | | |
| 1956.0 20 | | |
| 2044.4 8 | | |
| 2130.0 20 | | |
| 2252.6 5 | | |
| 2337.4 6 | | |
| 2473.8 8 | | |
| 2631.2 8 | | |
| 2926.0 8 | | |

† From 1976Ta14, based on $\gamma(\theta)$ and compared with the predictions of compound nuclear statistical model. J^π of g.s. and first two excited states taken from Adopted Levels.

 $\gamma(^{52}\text{Mn})$

| E_γ † | I_γ ‡ | E_i (level) | J_i^π | E_f | J_f^π | Mult. | Comments |
|--------------|--------------|---------------|----------------|----------------------|-----------|---|----------|
| 152.2 5 | 3.1 | 884.4 | 3,4 | 731.8 4 | D+Q | $\delta=-0.56$ 10 if $J(884)=4$ (1976Ta14). | |
| 168.1 5 | 70.6 | 546.4 | 1 ⁺ | 378.1 2 ⁺ | D+Q | $-5.4 < \delta < +0.03$ (1976Ta14). | |
| 340.4 5 | 9.4 | 887.1 | 2 | 546.4 1 ⁺ | D(+Q) | $\delta: < 0.03$ (1976Ta14). | |
| 345.1 5 | 7.6 | 1232.5 | 2,3,4 | 887.1 2 | | | |
| 353.7 5 | 5.6 | 731.8 | 4 | 378.1 2 ⁺ | Q | δ : authors assumed negligible L=3 admixture. | |
| 394.6 5 | 19.3 | 1279.2 | | 884.4 3,4 | | | |
| 404.4 5 | 2.0 | 1683.9 | | 1279.2 | | | |
| 414.7 5 | 18.0 | 1647.2 | | 1232.5 2,3,4 | | | |
| 447.4 5 | 100 | 825.5 | 2,3 | 378.1 2 ⁺ | D+Q | $\delta=-0.038$ 10 from $E(p)=6.85$ MeV data, $\delta=-0.005$ 10 from $E(p)=6.50$ MeV data, if $J(826)=3$ (1976Ta14). | |
| 453.6 5 | 29.3 | 1279.2 | | 825.5 2,3 | | | |
| 500.8 5 | 18.4 | 1232.5 | 2,3,4 | 731.8 4 | | | |
| 506.6 5 | (108) | 884.4 | 3,4 | 378.1 2 ⁺ | | I_γ : partially obscured by annihilation radiation. | |
| 508.8 5 | (86) | 887.1 | 2 | 378.1 2 ⁺ | | I_γ : partially obscured by annihilation radiation. | |

Continued on next page (footnotes at end of table)

$^{52}\text{Cr}(\text{p},\text{n}\gamma)$ 1973De03,1976Ta14 (continued) $\gamma(^{52}\text{Mn})$ (continued)

| E_γ^\dagger | I_γ^\ddagger | E_i (level) | J_i^π | E_f | J_f^π | Mult. | Comments |
|---------------------|---------------------|---------------|-----------|-------|----------------|-------|--|
| 521.8 5 | 4.2 | 1253.7 | 4,5,6 | 731.8 | 4 | | |
| 731.5 5 | 64.9 | 731.8 | 4 | 0.0 | 6 ⁺ | Q | δ : authors assumed negligible L=3 admixture. |
| 762.7 5 | 6.4 | 1647.2 | | 884.4 | 3,4 | | |
| 854.6 5 | 39.5 | 1232.5 | 2,3,4 | 378.1 | 2 ⁺ | | |
| 869.7 5 | 9.7 | 869.7 | | 0.0 | 6 ⁺ | | |
| 952.1 5 | 4.2 | 1683.9 | | 731.8 | 4 | | |
| 1218.9 5 | 6.2 | 2044.4 | | 825.5 | 2,3 | | |
| 1253.7 5 | 17.7 | 1253.7 | 4,5,6 | 0.0 | 6 ⁺ | | |
| 1450.2 5 | 6.0 | 2337.4 | | 887.1 | 2 | | |
| 1512.0 5 | 7.4 | 2337.4 | | 825.5 | 2,3 | | |
| 1586.7 5 | 12.8 | 2473.8 | | 887.1 | 2 | | |
| 1684.1 5 | 13.6 | 1683.9 | | 0.0 | 6 ⁺ | | |
| 1956 [#] 2 | 8.7 | 1956.0 | | 0.0 | 6 ⁺ | | |
| 2084.7 5 | 6.1 | 2631.2 | | 546.4 | 1 ⁺ | | |
| 2130 [#] 2 | 14.1 | 2130.0 | | 0.0 | 6 ⁺ | | |
| 2252.5 5 | 14.5 | 2252.6 | | 0.0 | 6 ⁺ | | |
| 2379.5 5 | 3.1 | 2926.0 | | 546.4 | 1 ⁺ | | |

[†] From 1973De03.[‡] Intensity relative to $I\gamma(447)=100$ at $E(\text{p})=10$ MeV from 1973De03. Uncertainties $\approx 25\%$ for strong transitions and 50% to 100% for the weaker ones.

Possible doublet.

