## $^{14}$C($^{48}$Ca,$\alpha$n$\gamma$) 2005De34

History

| Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | Balraj Singh | ENSDF | 12-Apr-2010 |

E=130 MeV. Measured E$\gamma$, I$\gamma$, $\gamma\gamma$, (fragment)$\gamma$ coin, $\gamma(\theta)$ with the.
Gammasphere array of 100 Compton-suppressed Ge detectors. Reaction products separated using Fragment Mass Analyzer (FMA) at ANL. $\Delta$E and time-of-flight measured with a parallel-grid avalanche counter and a segmented ion chamber, and were used to identify reaction products.

### $^{57}$Cr Levels

| E(level)[†] | J$^\pi$[‡] | Comments |
|---|---|---|
| 0.0[a] | 3/2$^-$ | |
| 267.87[a] 8 | 5/2$^-$[#] | |
| 692.69[a] 9 | 5/2$^-$[#] | |
| 941.79[a] 10 | 7/2$^-$[#] | |
| 1506.91[@] 14 | 9/2$^{(+)}$ | E(level): $\gamma$ decays from this level to predicted 5/2$^+$ band member, ≈360 keV below the 9/2$^+$ member is not observed in 2005De34. For E$\gamma$=360 keV, detectable limit of intensity is <4%. The 1/2$^+$ bandhead is predicted at ≈120 keV below the 9/2$^+$ member, E4 transition is unlikely. |
| 1581.13[&] 19 | 9/2$^{(-)}$ | |
| 1858.1 4 | (9/2$^-$) | |
| 2098.15[&] 22 | 11/2$^{(-)}$ | |
| 2344.50[@] 19 | 13/2$^{(+)}$ | |
| 2611.6[&] 3 | (13/2$^-$) | |
| 3377.6 6 | | |
| 3500.4[@] 3 | 17/2$^{(+)}$ | |
| 3555.4[&] 5 | (15/2$^-$) | |
| 4136.4 8 | | |
| 4827.0 15 | | |
| 4856.4 11 | | |
| 4920.1[&] 10 | | |
| 5018.6[@] 5 | 21/2$^{(+)}$ | |
| 6814.7[@] 10 | (25/2$^+$) | |
| 8844.4[@] 21 | (29/2$^+$) | |
| 10972[@] 5 | (33/2$^+$) | |
| 12950?[@] 6 | (37/2$^+$) | Configuration=$\pi(f^4_{7/2})\nu(g_{9/2})\nu(f_{5/2}p_{3/2}p_{1/2})^4$. |

[†] From least-squares fit to E$\gamma$'s.
[‡] Assignments based on $\gamma(\theta)$ data and band assignments.
[#] Parity assignment based on observed direct $\beta$-feeding of level in decay of $^{57}$V. The level is based on excitations of *pf*-shell neutrons.
[@] Band(A): $\nu$1/2[440], prolate decoupled band. Positive parity assignment from comparison with $^{55}$Cr isotone. The 1/2$^+$ and 5/2$^+$ band members are expected at ≈120 keV and ≈360 keV, respectively, below the 9/2$^+$ member.
[&] Band(B): $\gamma$-sequence based on 9/2$^{(-)}$.
[a] Band(C): $\gamma$-sequence based on g.s.

## $^{14}C(^{48}Ca,\alpha n\gamma)$ 2005De34 (continued)

### $\gamma(^{57}Cr)$

| $E_\gamma$ | $I_\gamma$ | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult.[†] | Comments |
|---|---|---|---|---|---|---|---|
| 240.8 *4* | 4.6 *6* | 2098.15 | $11/2^{(-)}$ | 1858.1 | $(9/2^-)$ | | |
| 249.08 *8* | 60.9 *22* | 941.79 | $7/2^-$ | 692.69 | $5/2^-$ | D[#] | $A_2$=−0.16 *5* |
| 267.92 *9* | 65.7 *24* | 267.87 | $5/2^-$ | 0.0 | $3/2^-$ | D[#] | $A_2$=−0.09 *5* |
| 424.90 *14* | 14.8 *10* | 692.69 | $5/2^-$ | 267.87 | $5/2^-$ | | |
| 513.4 *2* | 15.2 *16* | 2611.6 | $(13/2^-)$ | 2098.15 | $11/2^{(-)}$ | | |
| 516.88 *19* | 33.3 *20* | 2098.15 | $11/2^{(-)}$ | 1581.13 | $9/2^{(-)}$ | | |
| 565.11 *10* | 89 *5* | 1506.91 | $9/2^{(+)}$ | 941.79 | $7/2^-$ | D+Q[#] | $A_2$=−0.30 *4* |
| 639.1 *2* | 29.5 *17* | 1581.13 | $9/2^{(-)}$ | 941.79 | $7/2^-$ | D+Q[#] | $A_2$=−0.31 *8* |
| 673.8 *2* | 28.3 *18* | 941.79 | $7/2^-$ | 267.87 | $5/2^-$ | | |
| 692.61 *12* | 60 *3* | 692.69 | $5/2^-$ | 0.0 | $3/2^-$ | D+Q[#] | $A_2$=−0.44 *8* |
| 720.0 *8* | 12.9 *13* | 4856.4 | | 4136.4 | | | |
| 758.8 *5* | 13.5 *18* | 4136.4 | | 3377.6 | | | |
| 837.59 *12* | 88 *5* | 2344.50 | $13/2^{(+)}$ | 1506.91 | $9/2^{(+)}$ | (Q)[‡] | $A_2$=+0.18 *5* |
| 941.75 *18* | 100 *5* | 941.79 | $7/2^-$ | 0.0 | $3/2^-$ | (Q)[‡] | $A_2$=+1.1 *1* |
| 943.8 *4* | 22 *3* | 3555.4 | $(15/2^-)$ | 2611.6 | $(13/2^-)$ | D+Q[#] | $A_2$=−0.77 *7* |
| 1030.8 *5* | 20 *10* | 2611.6 | $(13/2^-)$ | 1581.13 | $9/2^{(-)}$ | | |
| 1155.9 *2* | 69 *7* | 3500.4 | $17/2^{(+)}$ | 2344.50 | $13/2^{(+)}$ | (Q)[‡] | $A_2$=+0.19 *4*<br>$A_2$ for 1155.9+1156.0 doublet. |
| 1156.0 *4* | 49 *12* | 2098.15 | $11/2^{(-)}$ | 941.79 | $7/2^-$ | (Q)[‡] | $A_2$=+0.19 *4*<br>$A_2$ for 1155.9+1156.0 doublet. |
| 1166.5 *6* | 6.4 *13* | 1858.1 | $(9/2^-)$ | 692.69 | $5/2^-$ | | |
| 1279.4 *5* | 33 *3* | 3377.6 | | 2098.15 | $11/2^{(-)}$ | | |
| 1313.8 *4* | 8.3 *24* | 1581.13 | $9/2^{(-)}$ | 267.87 | $5/2^-$ | (Q)[‡] | $A_2$=+0.19 *9* |
| 1326.6 *14* | 19.0 *25* | 4827.0 | | 3500.4 | $17/2^{(+)}$ | | |
| 1364.7 *8* | 16.0 *25* | 4920.1 | | 3555.4 | $(15/2^-)$ | | |
| 1518.2 *4* | 57 *3* | 5018.6 | $21/2^{(+)}$ | 3500.4 | $17/2^{(+)}$ | (Q)[‡] | $A_2$=+0.20 *11* |
| 1593.8 *17* | 10.5 *24* | 1858.1 | $(9/2^-)$ | 267.87 | $5/2^-$ | | |
| 1796.0 *8* | 27.7 *22* | 6814.7 | $(25/2^+)$ | 5018.6 | $21/2^{(+)}$ | | |
| 1978[@] *4* | 6.5 *17* | 12950? | $(37/2^+)$ | 10972 | $(33/2^+)$ | | |
| 2029.7 *18* | 16 *3* | 8844.4 | $(29/2^+)$ | 6814.7 | $(25/2^+)$ | | |
| 2128 *4* | 8.6 *19* | 10972 | $(33/2^+)$ | 8844.4 | $(29/2^+)$ | | |

[†] $A_2$ coefficients used by 2005De34 to identify stretched ΔJ=1 and ΔJ=2 transitions.
[‡] $A_2$ consistent with ΔJ=2, quadrupole.
[#] $A_2$ consistent with ΔJ=1, dipole or dipole+quadrupole.
[@] Placement of transition in the level scheme is uncertain.

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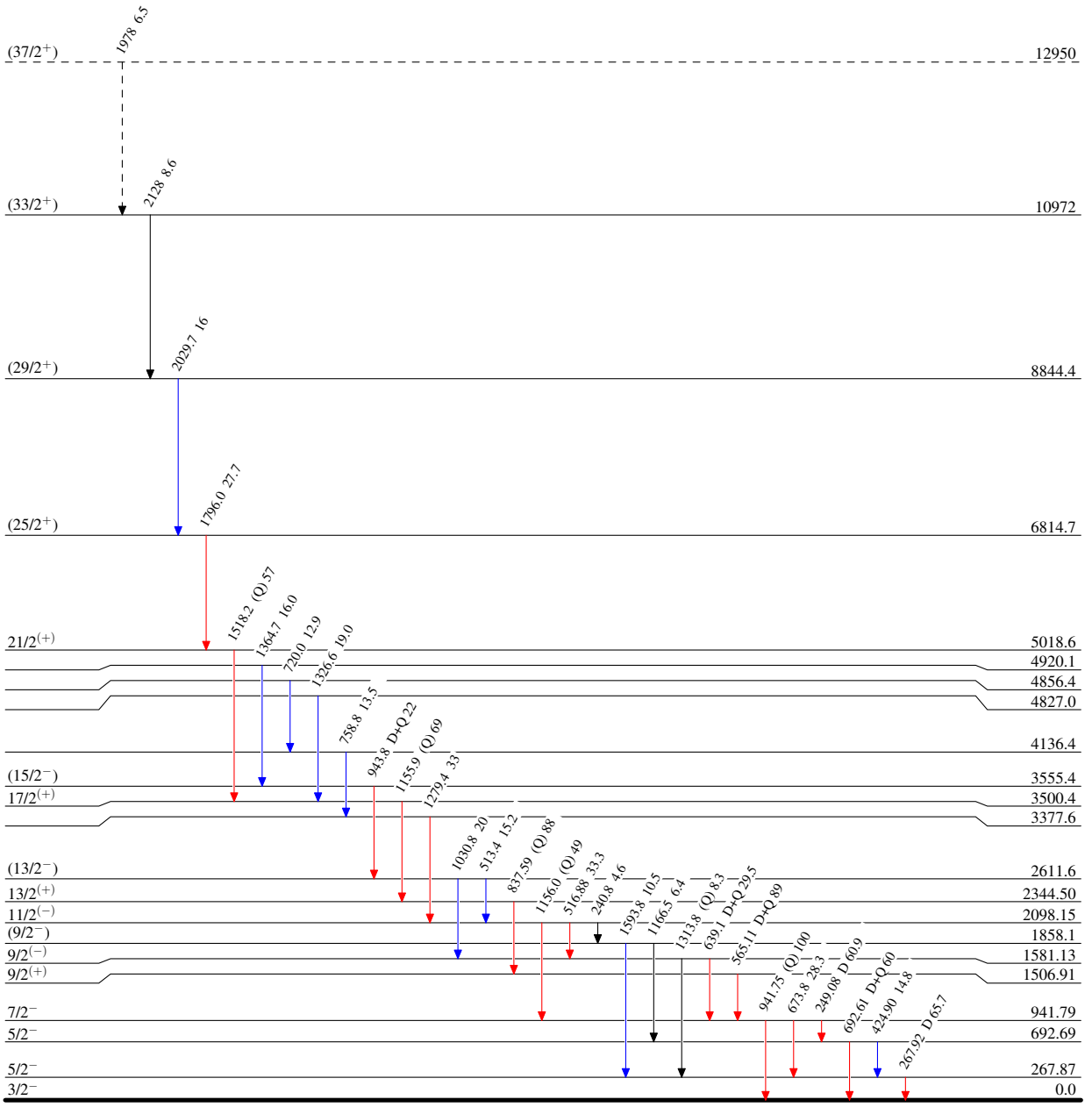
Level Scheme

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)




$^{57}_{24}Cr_{33}$

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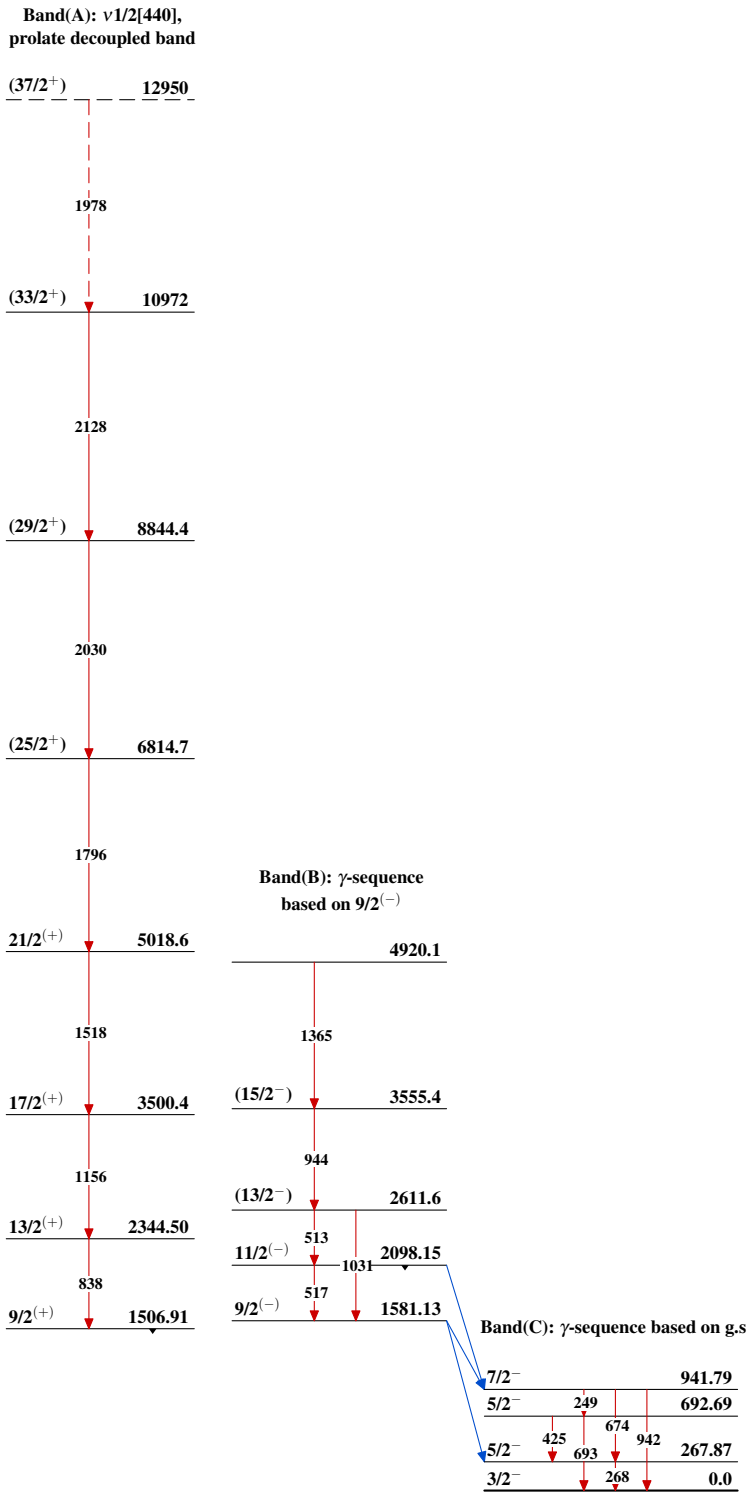


$^{57}_{24}Cr_{33}$