## $^{142}$Ce($\gamma$,$\gamma'$) 2004Ga25

History

| Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | T. D. Johnson, D. Symochko(a), M. Fadil(b), and J. K. Tuli | NDS 112, 1949 (2011) | 1-Jun-2010 |

Bremsstrahlung beam from DYNAMITRON accelerator with an endpoint energy of 4.1 MeV. Enriched target (91.5%). Measured E$\gamma$, RI, $\gamma(\theta)$, cross sections using three HPGe detectors. Deduced widths and lifetimes.

### $^{142}$Ce Levels

| E(level)[†] | J$^\pi$ | $T_{1/2}$ | Comments |
|---|---|---|---|
| 0.0 | $0^+$ | | |
| 641.3 *6* | $2^+$ | | E(level): from Adopted Levels. |
| 2187.0 *8* | $1^-$ | 7.07 fs *28* | $\Gamma_0$=0.0398 *14* eV. |
| 2397.8 *8* | $1^+$ | 49.9 fs *28* | $\Gamma_0$=0.0074 *5* eV. |
| 2800.8 *8* | $1^{(+)}$ | 12.8 fs *5* | $\Gamma_0$=0.0299 *12* eV. |
| 2999.7 *8* | 1 | 14.6 fs *14* | $\Gamma_0$=0.0119 *9* eV. |
| 3012.5 *10* | 1 | 20.4 fs *7* | $\Gamma_0$=0.0224 *8* eV. |
| 3313.8 *8* | 1 | 13.3 fs *6* | $\Gamma_0$=0.0283 *13* eV. |
| 3400.9 *10* | 1 | 13.6 fs *5* | $\Gamma_0$=0.0336 *12* eV. |
| 3515.1 *8* | 1 | 33 fs *+6−4* | $\Gamma_0$=0.0067 *10* eV. |
| 3632.6 *10* | 1 | 36.7 fs *21* | $\Gamma_0$=0.0123 *7* eV. |
| 3643.5 *10* | 1 | 15.2 fs *7* | $\Gamma_0$=0.0295 *12* eV. |
| 3718.9 *10* | 1 | 40.9 fs *28* | $\Gamma_0$=0.0112 *8* eV. |
| 3745.8 *10* | 1 | 37.4 fs *28* | $\Gamma_0$=0.0112 *9* eV. |
| 3776.7 *10* | 1 | 33.3 fs *28* | $\Gamma_0$=0.0136 *10* eV. |
| 3850.3 *10* | 1 | 22.2 fs *21* | $\Gamma_0$=0.0203 *16* eV. |

[†] From least-squares fit to E$\gamma'$s assuming $\Delta$(E$\gamma$)=0.5 keV for each $\gamma$ ray.

### $\gamma$($^{142}$Ce)

| $E_i$(level) | $J_i^\pi$ | $E_\gamma$ | $I_\gamma$ | $E_f$ | $J_f^\pi$ | Comments |
|---|---|---|---|---|---|---|
| 2187.0 | $1^-$ | 1545.7 | 63 *2* | 641.3 | $2^+$ | B(E1)=6.4×10$^{-5}$ *3*. |
| | | 2187.0 | 100 | 0.0 | $0^+$ | B(E1)=3.62×10$^{-5}$ *12*. |
| 2397.8 | $1^+$ | 1756.5 | 24 *5* | 641.3 | $2^+$ | B(M1)=0.028 *6*, B(E2)=0.0132 *28*. |
| | | 2397.8 | 100 | 0.0 | $0^+$ | B(M1)=0.047 *3*. |
| 2800.8 | $1^{(+)}$ | 2159.5 | 19 *2* | 641.3 | $2^+$ | B(M1)=0.049 *5*, B(E2)=0.0151 *17*. |
| | | 2800.8 | 100 | 0.0 | $0^+$ | B(M1)=0.118(7). |
| 2999.7 | 1 | 2358.4 | 165 *12* | 641.3 | $2^+$ | B(E1)=1.4×10$^{-5}$ *2*, B(M1)=0.13 *1*, B(E2)=0.033 *4*. |
| | | 2999.7 | 100 | 0.0 | $0^+$ | B(E1)=4.2×10$^{-6}$ *6*, B(M1)=0.038 *5*. |
| 3012.5 | 1 | 3012.5 | 100 | 0.0 | $0^+$ | B(E1)=7.8×10$^{-6}$ *3*, B(M1)=0.071 *3*. |
| 3313.8 | 1 | 2672.5 | 21 *3* | 641.3 | $2^+$ | B(E1)=3.0×10$^{-6}$ *6*, B(M1)=0.027 *5*, B(E2)=5.4×10$^{-3}$ *11*. |
| | | 3313.8 | 100 | 0.0 | $0^+$ | B(E1)=7.4×10$^{-6}$ *4*, B(M1)=0.067 *3*. |
| 3400.9 | 1 | 3400.9 | 100 | 0.0 | $0^+$ | B(E1)=8.2×10$^{-6}$ *3*, B(M1)=0.074 *3*. |
| 3515.1 | 1 | 2873.8 | 110 *21* | 641.3 | $2^+$ | B(E1)=3.0×10$^{-6}$ *7*, B(M1)=0.027 *5*, B(E2)=4.7×10$^{-3}$ *10*. |
| | | 3515.1 | 100 | 0.0 | $0^+$ | B(E1)=1.5×10$^{-6}$ *3*, B(M1)=0.013 *3*. |
| 3632.6 | 1 | 3632.6 | 100 | 0.0 | $0^+$ | B(E1)=2.4×10$^{-6}$ *2*, B(M1)=0.022 *2*. |
| 3643.5 | 1 | 3643.4 | 100 | 0.0 | $0^+$ | B(E1)=5.8×10$^{-6}$ *3*, B(M1)=0.053 *2*. |
| 3718.9 | 1 | 3718.8 | 100 | 0.0 | $0^+$ | B(E1)=2.1×10$^{-6}$ *2*, B(M1)=0.019 *1*. |
| 3745.8 | 1 | 3745.7 | 100 | 0.0 | $0^+$ | B(E1)=2.2×10$^{-6}$ *2*, B(M1)=0.020 *1*. |
| 3776.7 | 1 | 3776.6 | 100 | 0.0 | $0^+$ | B(E1)=2.4×10$^{-6}$ *2*, B(M1)=0.022 *1*. |
| 3850.3 | 1 | 3850.2 | 100 | 0.0 | $0^+$ | B(E1)=3.4×10$^{-6}$ *3*, B(M1)=0.031 *3*. |

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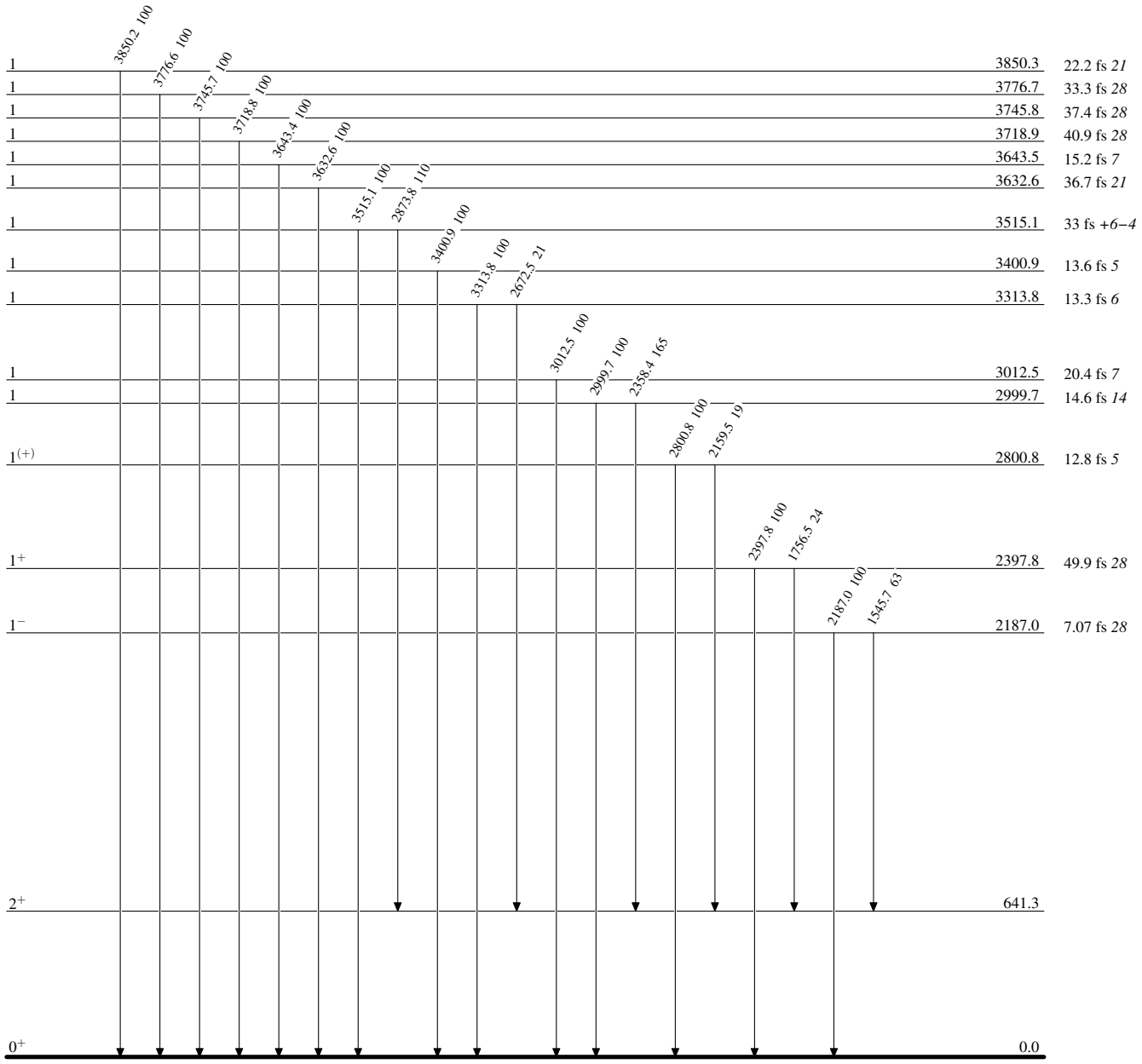
### Level Scheme

Intensities: Relative photon branching from each level




$^{142}_{58}Ce_{84}$