# $^{107}$Mo $\beta^-$ decay 1986OhZZ

| Type | Author | History Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | Jean Blachot | NDS 109, 1383 (2008) | 1-Mar-2008 |

Parent: $^{107}$Mo: E=0.0; $J^\pi$=(5/2$^+$); $T_{1/2}$=3.5 s *5*; Q($\beta^-$)=6450 *SY*; %$\beta^-$ decay=100.0
Source from $^{239}$Pu(n,F) E=th; rapid molybdenum chem (1977Ti02).
Activity: $^{239}$Pu(n,F) E=th. On-line separator JOSEF (1986OhZZ).
Assignments based on $\gamma$-decay rates in successive semi $\gamma$-singles spectra and genetics.
The decay scheme is preliminary and incomplete. Only the 65 and 137 levels are seen in the $^{252}$Cf decay (1998Hw04).
Others: 1972Tr08, 1976KaYO, 1977Ti02.
Measured: $\gamma$, $\gamma\gamma$, ce, $\gamma$(t) (1986OhZZ).
Measured: $\beta\gamma$ (1989Gr23).

## $^{107}$Tc Levels

| E(level) | $J^\pi$ | $T_{1/2}$ | Comments |
|---|---|---|---|
| 0.0 | (3/2$^-$) | 21.2 s *2* | |
| 45.6 | | | E(level): the relative order of the 20.0$\gamma$ and 45.6$\gamma$ is not established in $^{107}$Mo $\beta^-$ decay so a level at 20.0 instead of at 45.6 could be possible; however, a 2-component $T_{1/2}$ value (6 ns and 194 ns) measured in SF for 45.6$\gamma$ suggests that it lies below 20.6$\gamma$ and that $T_{1/2}$(45.6)=6 ns *2*. |
| 65.7 | (5/2$^-$) | 184 ns *3* | $T_{1/2}$: from $\beta\gamma$ and $\gamma\gamma$ coin.<br>E(level): see Adopted Levels for a possible level at 20.0 keV. |
| 137.4 | (7/2$^+$) | | |
| 466.1 | | | E(level): E$\beta$=5765 *105* (1989Gr23). |
| 495.9 | | | E(level): E$\beta$=5715 *100* (1989Gr23). |
| 549.4 | | | E(level): E$\beta$=5555 *150* (1989Gr23). |
| 850.7 | | | E(level): E$\beta$=5253 *90* (1989Gr23) from coin with 301$\gamma$ and 785$\gamma$. E$\beta$=5300 *85* for coin with 384$\gamma$, so 384$\gamma$ could belong to some other level. |
| 1374.6 | | | |

## $\gamma$($^{107}$Tc)

| $E_\gamma$ | $I_\gamma$ | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult.[‡] | $\delta$ | $\alpha$[†] | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 20.0 | | 65.7 | (5/2$^-$) | 45.6 | | | | | |
| 45.6 | | 45.6 | | 0.0 | (3/2$^-$) | | | | |
| 53.7 | 3.7 | 549.4 | | 495.9 | | E1 | | 1.0 *4* | $\alpha$(K)=0.689 *10*; $\alpha$(L)=0.0843 *12*; $\alpha$(M)=0.01512 *22*; $\alpha$(N+..)=0.00245 *4*<br>$\alpha$(N)=0.00232 *4*; $\alpha$(O)=0.0001240 *18* |
| 65.7 | ≥92 | 65.7 | (5/2$^-$) | 0.0 | (3/2$^-$) | M1+E2 | 0.29 *3* | 1.35 *7* | |
| 71.7 | 23.3 | 137.4 | (7/2$^+$) | 65.7 | (5/2$^-$) | D | | 0.52 *9* | |
| 83.3 | 6.8 | 549.4 | | 466.1 | | M1 | | 0.467 | $\alpha$(K)=0.407 *6*; $\alpha$(L)=0.0490 *7*; $\alpha$(M)=0.00891 *13*; $\alpha$(N+..)=0.001505 *21*<br>$\alpha$(N)=0.001413 *20*; $\alpha$(O)=9.24×10$^{-5}$ *13* |
| 301.3 | 19 | 850.7 | | 549.4 | | | | | |
| 354.8 | 9.6 | 850.7 | | 495.9 | | | | | |
| 358.5 | 27.5 | 495.9 | | 137.4 | (7/2$^+$) | | | | |
| 384.4 | 57.6 | 850.7 | | 466.1 | | | | | |
| 400.3 | 100 | 466.1 | | 65.7 | (5/2$^-$) | | | | |
| 411.9 | 8.0 | 549.4 | | 137.4 | (7/2$^+$) | | | | |
| 430.1 | 13 | 495.9 | | 65.7 | (5/2$^-$) | | | | |
| 465.8 | 3 | 466.1 | | 0.0 | (3/2$^-$) | | | | |
| 483.6 | 41.6 | 549.4 | | 65.7 | (5/2$^-$) | | | | |
| 549.4 | 8.0 | 549.4 | | 0.0 | (3/2$^-$) | | | | |
| 713.5 | 2 | 850.7 | | 137.4 | (7/2$^+$) | | | | |
| 785.0 | 27.2 | 850.7 | | 65.7 | (5/2$^-$) | | | | |

Continued on next page (footnotes at end of table)

## $^{107}$Mo $\beta^-$ decay 1986OhZZ (continued)

### $\gamma(^{107}Tc)$ (continued)

| $E_\gamma$ | $I_\gamma$ | $E_i$(level) | $E_f$ | $J_f^\pi$ |
|---|---|---|---|---|
| 878.5 | 3.5 | 1374.6 | 495.9 | |
| 909.3 | 3.8 | 1374.6 | 466.1 | |
| 1308.9 | 11.5 | 1374.6 | 65.7 | $(5/2^-)$ |

† Experimental values based on intensity balances in $\gamma\gamma$.
‡ From $\alpha$(exp).

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### Decay Scheme

Intensities: Type not specified