## Adopted Levels, Gammas

History

| Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | G. Gürdal and F. G. Kondev | NDS 113,1315 (2012) | 1-Aug-2011 |

Q($\beta^-$)=9038 *13*; S(n)=4823 *13*; S(p)=11649 *15*; Q($\alpha$)=−7258 *11* 2012Wa38
Note: Current evaluation has used the following Q record 9039 13 4823 *13* 11644 *15* −7258 *10* 2011AuZZ.

### $^{110}$Tc Levels

Cross Reference (XREF) Flags

A $^{110}$Mo $\beta^-$ decay
B $^{252}$Cf SF decay

| E(level)† | J$^\pi$ | $T_{1/2}$ | XREF | Comments |
|---|---|---|---|---|
| 0.0 | (2,3$^+$) | 0.900 s *13* | AB | %$\beta^-$=100; %$\beta^-$n=0.04 *2* (1996Me09)<br>$\beta^-$n; Other: ≤4 (2009Pe06).<br>J$^\pi$: 53.3$\gamma$, 142.1$\gamma$, 262.9$\gamma$, 741.4$\gamma$ from (1$^+$) levels in $^{110}$Tc; direct population of 2$^+$ and 4$^+$ levels in the daughter nucleus $^{110}$Ru, following $^{110}$Tc $\beta^-$ decay, albeit the decay scheme suffers from the pandemonium problem. The assignment is tentative.<br>$T_{1/2}$: Weighted average of 0.820 s *56* (using $\beta$(t) and maximum likelihood method in 2009Pe06), 0.910 s *14* (using $\beta$(t) and least-squares fit method in 2009Pe06), 0.78 s *15* (using $\beta$(t) in 1996Me09), 0.92 s *3* (using 241$\gamma$-$\beta$(t) in 1990Ay02), 1.0 s *2* (using 241$\gamma$-$\beta$(t) in 1990Al43), 1.0 s *2* (using 241$\gamma$-$\beta$(t) in 1976Tr02) and 0.83 s *4* in 1969WiZX. Other: 0.90 s *10* (value quoted in 1990Ay02), 0.92 s *3* (2002Pf04 compilation). |
| 39.50 *9* | | | A | |
| 53.30 *10* | (1$^+$) | | AB | J$^\pi$: Direct $\beta^-$ decay feeding from $^{110}$Mo $\beta^-$ decay ($J^\pi$=0$^+$). The assignment is tentative. |
| 142.05 *11* | (1$^+$) | <10 ns | A | J$^\pi$: Direct $\beta^-$ decay feeding from $^{110}$Mo $\beta$-decay ($J^\pi$=0$^+$). The assignment is tentative.<br>$T_{1/2}$: From 1994Lh02. |
| 152.2 *5* | | | B | |
| 185.00# *15* | (1$^+$) | | AB | J$^\pi$: Direct $\beta^-$ decay feeding from $^{110}$Mo $\beta^-$ decay ($J^\pi$=0$^+$). The assignment is tentative. |
| 240.3 *7* | | | B | |
| 256.7 *7* | | | B | |
| 263.00 *10* | (1$^+$) | | A | J$^\pi$: Direct $\beta^-$ decay feeding from $^{110}$Mo $\beta$-decay ($J^\pi$=0$^+$). The assignment is tentative. |
| 266.9# *6* | | | B | |
| 366.2# *8* | | | B | |
| 467.58 *12* | (1$^+$) | | A | J$^\pi$: Direct $\beta^-$ decay feeding from $^{110}$Mo $\beta$-decay ($J^\pi$=0$^+$). The assignment is tentative. |
| 478.7‡ *8* | | | B | |
| 512.4# *9* | | | B | |
| 589.6 *4* | | | A | |
| 605.0‡ *9* | | | B | |
| 740.65 *11* | (1$^+$) | | A | J$^\pi$: Direct $\beta^-$ decay feeding from $^{110}$Mo $\beta$-decay ($J^\pi$=0$^+$). The assignment is tentative. |
| 783.2‡ *9* | | | B | |
| 908.75 *15* | (1$^+$) | | A | J$^\pi$: Direct $\beta^-$ decay feeding from $^{110}$Mo $\beta$-decay ($J^\pi$=0$^+$). The assignment is tentative. |
| 962.1‡ *9* | | | B | |

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## Adopted Levels, Gammas (continued)

### $^{110}$Tc Levels (continued)

| E(level)† | XREF | E(level)† | XREF | E(level)† | XREF |
|---|---|---|---|---|---|
| 1271.0‡ *9* | B | 1917.6‡ *10* | B | 2699.3‡ *11* | B |
| 1430.2‡ *10* | B | 2046.3‡ *10* | B | 2792.2‡ *11* | B |
| | | | | 3677.1‡ *12* | B |

† From a least-square fit to $E_\gamma$.
‡ Band(A): band 1.
# Band(B): band 2.

### $\gamma(^{110}Tc)$

| $E_i$(level) | $J_i^\pi$ | $E_\gamma$† | $I_\gamma$† | $E_f$ | $J_f^\pi$ | Mult. | α# | Comments |
|---|---|---|---|---|---|---|---|---|
| 39.50 | | 39.4 *1* | 100 | 0.0 | (2,3$^+$) | (M1) | 4.05 | α(K)=3.53 *6*; α(L)=0.430 *7*; α(M)=0.0781 *13*; α(N+..)=0.01316 *21*<br>α(N)=0.01236 *20*; α(O)=0.000800 *13*<br>Mult.: From α(K)exp=2.9 *18* (1994Lh02), but E1 can not be unambiguously excluded. |
| 53.30 | (1$^+$) | 53.3 *1* | 100 | 0.0 | (2,3$^+$) | (M1) | 1.68 | α(K)=1.464 *22*; α(L)=0.177 *3*; α(M)=0.0322 *5*; α(N+..)=0.00544 *9*<br>α(N)=0.00511 *8*; α(O)=0.000332 *5*<br>Mult.: From α(K)exp=1.4 *7* (1994Lh02), but E1 can not be unambiguously excluded. |
| 142.05 | (1$^+$) | 142.1 *2* | 100 | 0.0 | (2,3$^+$) | [M1] | 0.1059 | α(K)=0.0925 *14*; α(L)=0.01099 *16*; α(M)=0.00200 *3*; α(N+..)=0.000338 *5*<br>α(N)=0.000317 *5*; α(O)=2.09×10$^{-5}$ *3*<br>B(M1)(W.u.)>0.00069 |
| 152.2 | | 98.9‡ *5* | 100‡ | 53.30 | (1$^+$) | | | |
| 185.00 | (1$^+$) | 131.7 *1* | 100 | 53.30 | (1$^+$) | | | |
| 240.3 | | 88.1‡ *5* | 100‡ | 152.2 | | | | |
| 256.7 | | 104.5‡ *5* | 100‡ | 152.2 | | | | |
| 263.00 | (1$^+$) | 121.0 *1* | 100 | 142.05 | (1$^+$) | | | |
| | | 223.4 *1* | 51 *5* | 39.50 | | | | |
| | | 262.9 *2* | 19.8 *22* | 0.0 | (2,3$^+$) | | | |
| 266.9 | | 81.9‡ *5* | 100‡ | 185.00 | (1$^+$) | | | |
| 366.2 | | 99.3‡ *5* | 100‡ | 266.9 | | | | |
| 467.58 | (1$^+$) | 203.6 *2* | 37 *7* | 263.00 | (1$^+$) | | | |
| | | 325.7 *1* | 100 | 142.05 | (1$^+$) | | | |
| 478.7 | | 222.0‡ *5* | 100‡ | 256.7 | | | | |
| | | 238.4‡ *5* | 36‡ | 240.3 | | | | |
| 512.4 | | 146.2‡ *5* | 100‡ | 366.2 | | | | |
| 589.6 | | 447.6 *3* | 100 | 142.05 | (1$^+$) | | | |
| 605.0 | | 126.3‡ *5* | 100‡ | 478.7 | | | | |
| 740.65 | (1$^+$) | 273.0 *1* | 7.3 *20* | 467.58 | (1$^+$) | | | |
| | | 477.8 *1* | 64 *4* | 263.00 | (1$^+$) | | | |
| | | 598.4 *1* | 100 *5* | 142.05 | (1$^+$) | | | |
| | | 741.1 *2* | 20.6 *25* | 0.0 | (2,3$^+$) | | | |
| 783.2 | | 178.3‡ *5* | 100‡ | 605.0 | | | | |
| | | 304.5‡ *5* | 34‡ | 478.7 | | | | |
| 908.75 | (1$^+$) | 766.7‡ *1* | 100‡ | 142.05 | (1$^+$) | | | |
| 962.1 | | 178.9‡ *5* | 79‡ | 783.2 | | | | |

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## Adopted Levels, Gammas (continued)

### γ($^{110}$Tc) (continued)

| $E_i$(level) | $E_\gamma$[†] | $I_\gamma$[†] | $E_f$ | Comments |
|---|---|---|---|---|
| 962.1 | 357.1[‡] *5* | 100[‡] | 605.0 | |
| 1271.0 | 309.0[‡] *5* | 77.3[‡] | 962.1 | |
| | 487.7[‡] *5* | 100[‡] | 783.2 | |
| 1430.2 | 159.3[‡] *5* | 20.5[‡] | 1271.0 | |
| | 468.1[‡] *5* | 100[‡] | 962.1 | |
| 1917.6 | 487.3[‡] *5* | 46.5[‡] | 1430.2 | |
| | 646.6[‡] *5* | 100[‡] | 1271.0 | |
| 2046.3 | 128.8[‡] *5* | 17[‡] | 1917.6 | |
| | 616.1[‡] *5* | 100[‡] | 1430.2 | |
| 2699.3 | 653.0[@] | | 2046.3 | $E_\gamma$: From $^{252}$Cf SF decay. |
| | 781.7[‡] *5* | 100[‡] | 1917.6 | |
| 2792.2 | 745.8[‡] *5* | 100[‡] | 2046.3 | |
| 3677.1 | 884.9[‡] *5* | 100[‡] | 2792.2 | |

[†] From $^{110}$Mo $\beta^-$ decay, unless otherwise stated.
[‡] From $^{252}$Cf SF decay.
[#] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[@] Placement of transition in the level scheme is uncertain.

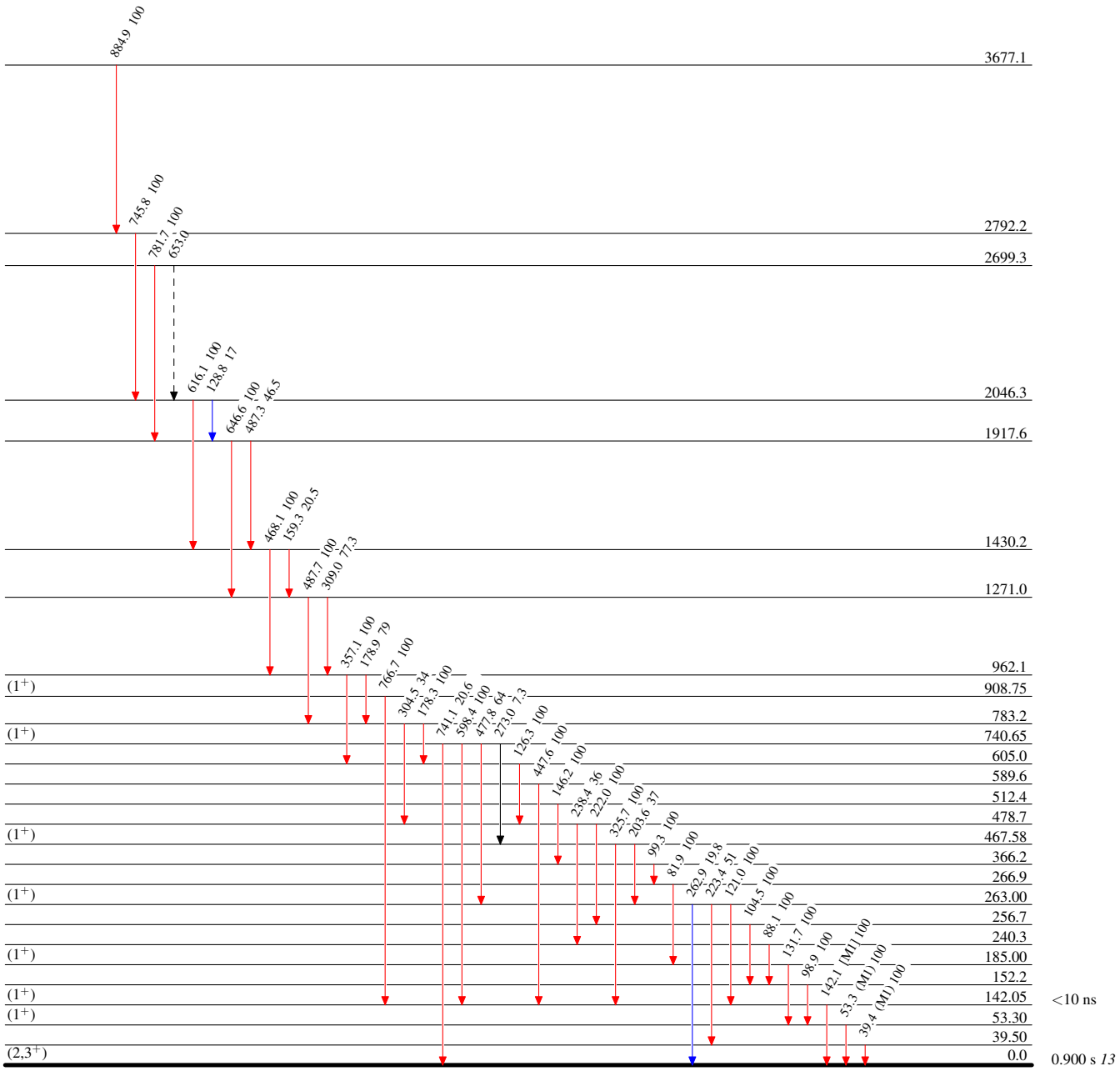
## Adopted Levels, Gammas

### Level Scheme

Intensities: Type not specified

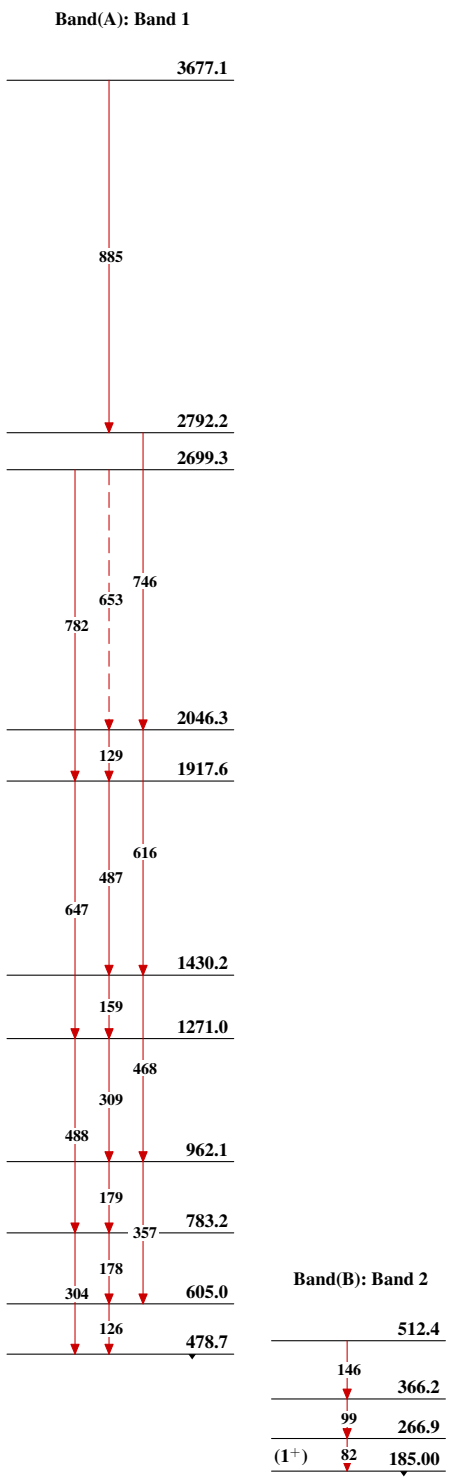
Legend

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




$^{110}_{43}Tc_{67}$

## Adopted Levels, Gammas




$^{110}_{43}Tc_{67}$