

^{103}Mo β^- decay 1980TiZX

Type	Author	History	Literature Cutoff Date
Full Evaluation	D. De Frenne	NDS 110, 2081 (2009)	1-Mar-2009

Parent: ^{103}Mo : E=0.0; $J^\pi=(3/2^+)$; $T_{1/2}=67.5$ s 15; $Q(\beta^-)=3750$ 60; % β^- decay=100.0

Assignment: mass separation of fission fragments and chemical separation of molybdenum produced in $^{235}\text{U}(n,\text{F})$. Measured: E γ , I γ , $\gamma\gamma$, $T_{1/2}$. Deduced: ^{103}Tc levels (1980TiZX).

1987Gr18: on-line mass separator LOHENGRIN, measured $\gamma\beta$, $Q(\beta^-)$, E β .

Others: 1977Ki14, 1977Ti02, 1976KaYO.

 ^{103}Tc Levels

From delayed $\gamma\gamma$ -coin results, states with $T_{1/2}>500$ ns are not observed.

E(level)	J^π [†]	E(level)	J^π [†]	E(level)	J^π [†]
0.0	$5/2^+$	469.83 13	$(3/2^+, 5/2^+)$	887.2 4	
45.80 13	$7/2^+$	487.1 4	$1/2^-$	1085.95 16	
83.38 16	$3/2^-$	519.22 20	$3/2^-$	1219.85 20	$(5/2^+, 7/2, 9/2^+)$
138.9 5	$9/2^+$	620.77 17		1494.44 22	
178.3 8	$5/2^-$	686.6 7		1621.1 6	
259.0 6	$5/2^-$	687.62 15	$(3/2^+, 5/2, 7/2)$		
383.2 3	$(3/2, 5/2, 7/2^-)$	691.59 16	$(1/2^+, 3/2, 5/2^-)$		

[†] From Adopted Levels.

 β^- radiations

Levels for which a net β -feeding is found from $I(\gamma+\text{ce})$ imbalances are indicated by arrows in the drawing.

E(decay)	E(level)	Comments
$(2.13 \times 10^3$ 6)	1621.1	
$(2.26 \times 10^3$ 6)	1494.44	
2.52×10^3 12	1219.85	E(decay): from 1987Gr18, no branching given.
2.60×10^3 10	1085.95	E(decay): from 1987Gr18, no branching given.
$(2.86 \times 10^3$ 6)	887.2	
3.07×10^3 12	691.59	E(decay): from 1987Gr18, no branching given.
$(3.06 \times 10^3$ 6)	687.62	
$(3.06 \times 10^3$ 6)	686.6	
$(3.13 \times 10^3$ 6)	620.77	
3.26×10^3 15	519.22	E(decay): from 1987Gr18, no branching given.
3.31×10^3 12	487.1	E(decay): from 1987Gr18, no branching given.
3.30×10^3 12	469.83	E(decay): from 1987Gr18, no branching given.
$(3.37 \times 10^3$ 6)	383.2	
$(3.49 \times 10^3$ 6)	259.0	
$(3.57 \times 10^3$ 6)	178.3	
$(3.67 \times 10^3$ 6)	83.38	
$(3.70 \times 10^3$ 6)	45.80	E(decay): $(3/2^+)$ to $(7/2^+)$, so no β feeding expected.
$(3.75 \times 10^3$ 6)	0.0	

[†] Existence of this branch is questionable.

$^{103}\text{Mo} \beta^-$ decay 1980TiZX (continued) $\gamma(^{103}\text{Tc})$

I γ normalization: from the low intensity of the A=103 γ 's compared to transitions in A=104, a large b $^-$ feeding to the ^{103}Tc g.s. can be expected (1980TiZX); however, the feeding is not known, so no normalization can be obtained.

E $_{\gamma}$	I $_{\gamma}$	E $_i$ (level)	J $^{\pi}_i$	E $_f$	J $^{\pi}_f$
45.8 2	82 17	45.80	7/2 $^+$	0.0	5/2 $^+$
83.4 2	145 22	83.38	3/2 $^-$	0.0	5/2 $^+$
93 [†] 1	15 [#] 5	138.9	9/2 $^+$	45.80	7/2 $^+$
95 [†] 1	16 [#] 5	178.3	5/2 $^-$	83.38	3/2 $^-$
150.8 5	16.1 18	620.77		469.83	(3/2 $^+$,5/2 $^+$)
172 1	13 4	691.59	(1/2 $^+$,3/2,5/2 $^-$)	519.22	3/2 $^-$
176 1	23 6	259.0	5/2 $^-$	83.38	3/2 $^-$
200.5 5	5.8 13	687.62	(3/2 $^+$,5/2,7/2)	487.1	1/2 $^-$
204.5 5	15.0 18	691.59	(1/2 $^+$,3/2,5/2 $^-$)	487.1	1/2 $^-$
205 [†] 1	3.2 [#] 15	383.2	(3/2,5/2,7/2 $^-$)	178.3	5/2 $^-$
217.8 2	22.0 16	687.62	(3/2 $^+$,5/2,7/2)	469.83	(3/2 $^+$,5/2 $^+$)
259 1	5.1 5	259.0	5/2 $^-$	0.0	5/2 $^+$
299.8 5	13.5 15	383.2	(3/2,5/2,7/2 $^-$)	83.38	3/2 $^-$
308.5 5	5.6 4	691.59	(1/2 $^+$,3/2,5/2 $^-$)	383.2	(3/2,5/2,7/2 $^-$)
330.9 5	3.7 4	469.83	(3/2 $^+$,5/2 $^+$)	138.9	9/2 $^+$
383.2 5	1.7 7	383.2	(3/2,5/2,7/2 $^-$)	0.0	5/2 $^+$
404 1	32 11	487.1	1/2 $^-$	83.38	3/2 $^-$
417.3 5	9.7 14	887.2		469.83	(3/2 $^+$,5/2 $^+$)
423.910 [‡] 17	100	469.83	(3/2 $^+$,5/2 $^+$)	45.80	7/2 $^+$
429 1	0.5 2	687.62	(3/2 $^+$,5/2,7/2)	259.0	5/2 $^-$
436 [†] 1	\leq [#]	519.22	3/2 $^-$	83.38	3/2 $^-$
469.8 2	22.1 16	469.83	(3/2 $^+$,5/2 $^+$)	0.0	5/2 $^+$
487 1	2.2 5	487.1	1/2 $^-$	0.0	5/2 $^+$
519.2 [†] 2	40 3	519.22	3/2 $^-$	0.0	5/2 $^+$
547.7 5	8.3 7	686.6		138.9	9/2 $^+$
574.8 5	6.9 8	620.77		45.80	7/2 $^+$
599.0 5	18.8 16	1219.85	(5/2 $^+$,7/2,9/2 $^+$)	620.77	
608.2 2	32.1 24	691.59	(1/2 $^+$,3/2,5/2 $^-$)	83.38	3/2 $^-$
616 1	2.2 4	1085.95		469.83	(3/2 $^+$,5/2 $^+$)
620.8 2	23.2 17	620.77		0.0	5/2 $^+$
641.8 5	9.5 11	687.62	(3/2 $^+$,5/2,7/2)	45.80	7/2 $^+$
687.6 2	45 4	687.62	(3/2 $^+$,5/2,7/2)	0.0	5/2 $^+$
691.6 2	20.7 16	691.59	(1/2 $^+$,3/2,5/2 $^-$)	0.0	5/2 $^+$
750.0 2	26.2 18	1219.85	(5/2 $^+$,7/2,9/2 $^+$)	469.83	(3/2 $^+$,5/2 $^+$)
887.3 5	5.1 6	887.2		0.0	5/2 $^+$
1040.2 2	33 5	1085.95		45.80	7/2 $^+$
1081 [†] 1	5 [#] 1	1219.85	(5/2 $^+$,7/2,9/2 $^+$)	138.9	9/2 $^+$
1085.9 2	25 4	1085.95		0.0	5/2 $^+$
1151.3 5	12.1 13	1621.1		469.83	(3/2 $^+$,5/2 $^+$)
1174.2 5	13.7 15	1219.85	(5/2 $^+$,7/2,9/2 $^+$)	45.80	7/2 $^+$
1220 1	6.7 8	1219.85	(5/2 $^+$,7/2,9/2 $^+$)	0.0	5/2 $^+$
1448.6 2	26.4 19	1494.44		45.80	7/2 $^+$
1494.6 5	7.1 9	1494.44		0.0	5/2 $^+$

[†] Seen only in coin spectrum.

[‡] From 1979Bo26.

[#] From $\gamma\gamma$.

$^{103}\text{Mo } \beta^- \text{ decay} \quad 1980\text{TiZX}$ 