

$\text{Cf}(^{18}\text{O}, \text{X}\gamma)$ 2010Ta10

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	A. M. Mattera, S. Zhu, A. B. Hayes, E. A. Mccutchan		NDS 172, 543 (2021)	1-Jan-2021

2010Ta10: Excited states in ^{252}Cf were populated in reactions of $^{250}\text{Cf}(^{18}\text{O}, ^{16}\text{O})$; $^{251}\text{Cf}(^{18}\text{O}, ^{16}\text{On})$ and $^{251}\text{Cf}(^{18}\text{O}, ^{17}\text{O})$ using 153 MeV ^{18}O beam on a radioactive Cf target with 63% ^{249}Cf , 13% ^{250}Cf and 24% ^{251}Cf . The γ rays were measured by six Ge detectors and were assigned to ^{252}Cf in correlation with four sets of Si $\Delta\text{E-E}$ telescopes for reaction channel selection. Experiment was carried out at the Japan Atomic Energy Agency-Tokai tandem accelerator facility. Measured E_γ , I_γ . Deduced levels, J, π .

α : [Additional information 1](#).

 ^{252}Cf Levels

E(level)	J $\pi^\ddagger$
0.0 †	0 $^+$
45.72 † 5	2 $^+$
151.74 † 7	4 $^+$
316.24 † 12	6 $^+$
536.6 † 3	8 $^+$
809.2 † 6	10 $^+$

† Band(A): Yrast Cascade.

‡ Based on multipolarity of γ rays connecting levels ([2010Ta10](#)).

 $\gamma(^{252}\text{Cf})$

For stretched quadrupole transitions, $I_\gamma(\text{in-plane})/I_\gamma(\text{out-of-plane})$ is expected to be > 1.0 .

E_γ	$I_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α	$I_{(\gamma+ce)}^\dagger$	Comments
(45.72 ‡ 5)		45.72	2 $^+$	0.0	0 $^+$	E2 ‡	9.2 $\times 10^2$ 5		
(106.02 ‡ 5)		151.74	4 $^+$	45.72	2 $^+$	E2 ‡	16.97 25		
^x 139.1									Observed but not placed in the level scheme. Consistent with the transition deexciting the 867.7-keV level (2010Ta10).
164.5 1	6.3 5	316.24	6 $^+$	151.74	4 $^+$	E2	2.49 11	22 2	Mult.: $I_\gamma(\text{in-plane})/I_\gamma(\text{out-of-plane})=1.33$ 22.
220.4 3	4.7 5	536.6	8 $^+$	316.24	6 $^+$	E2	0.791 32	8 1	Mult.: $I_\gamma(\text{in-plane})/I_\gamma(\text{out-of-plane})=1.1$ 3.
272.6 5	2.8 5	809.2	10 $^+$	536.6	8 $^+$	E2	0.373 14	4 1	Mult.: $I_\gamma(\text{in-plane})/I_\gamma(\text{out-of-plane})=1.4$ 4.

† From [2010Ta10](#).

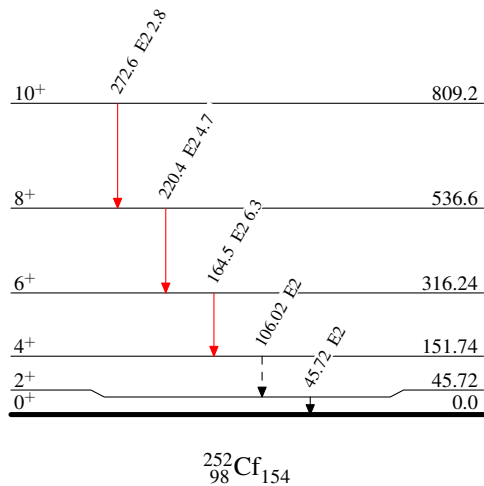
‡ Not observed in [2010Ta10](#), from Adopted Gammas.

^x γ ray not placed in level scheme.

Cf($^{18}\text{O},\text{X}\gamma$) 2010Ta10Level SchemeIntensities: Relative I_γ

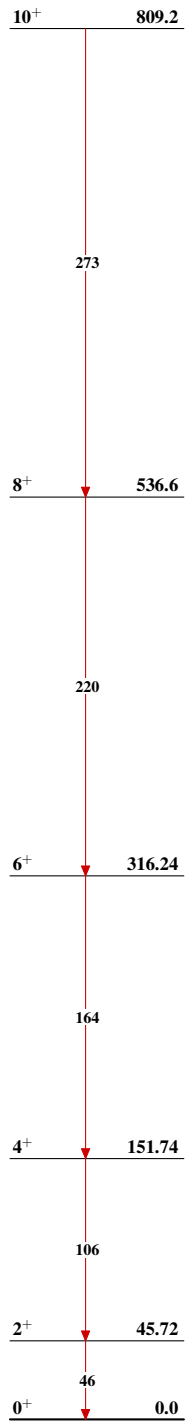
Legend

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



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Band(A): Yrast Cascade



$^{252}_{98}\text{Cf}_{154}$