

^{171}Hf IT decay **1997Ca39**

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin, E. A. Mccutchan		NDS 151, 334 (2018)	30-Jun-2018

Parent: ^{171}Hf : $E=21.93$ 9; $J^\pi=1/2^{(-)}$; $T_{1/2}=29.5$ s 9; %IT decay \leq 100.0

1997Ca39: produced isomer using $^{170}\text{Yb}(\alpha,3n)$ at $E\alpha=50$ MeV; enriched target in IGISOL gas chamber; mass-analyzed products deposited on tape for γ monitoring with Ge(Li) detector or implanted in front surface of a stack of two microchannel plates; measured decay of microchannel-plate count rate.

2000Ye02: produced isomer using the $^{175}\text{Lu}(p,5n)$ reaction with $E(p)=55$ MeV; on-line laser spectroscopy.

 ^{171}Hf Levels

E(level) [†]	J^π [†]	$T_{1/2}$	Comments
0.0	$7/2^{(+)}$	12.1 h 4	$T_{1/2}$: from Adopted Levels.
21.93 9	$1/2^{(-)}$	29.5 s 9	%IT \leq 100; % ϵ +% β^+ =? $\mu=+0.526$ 16 (2000Ye02) μ : from collinear laser beam spectroscopy (2000Ye02). %IT,% ϵ +% β^+ : the microchannel plates (1997Ca39) are sensitive to γ rays, low-energy electrons and x rays, so it is unclear whether this isomer decays by IT or ϵ decay or both. however, the analogous isomer In ^{169}Yb exhibits %IT=100. also, significant ϵ decay from this 1/2[521] level to the 79 s, 1/2[541] isomer At 71.1 keV In ^{171}Lu should have been evident In the measured activity decay curve, but was not. Consequently, it seems likely that %IT=100 for this level. $T_{1/2}$: from decay of activity in microchannel plates (1997Ca39).

[†] From Adopted Levels.

 $\gamma(^{171}\text{Hf})$

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α^\ddagger	$I_{(\gamma+ce)}$ [†]	Comments
(21.93 9)	21.93	$1/2^{(-)}$	0.0	$7/2^{(+)}$	[E3]	5.44×10^5 16	100	ce(L)/($\gamma+ce$)=0.704 16; ce(M)/($\gamma+ce$)=0.234 9; ce(N+)/($\gamma+ce$)=0.0623 25 ce(N)/($\gamma+ce$)=0.0559 23; ce(O)/($\gamma+ce$)=0.0064 3; ce(P)/($\gamma+ce$)= 3.53×10^{-6} 14 E_γ : from level energy difference in Adopted Levels. Mult.: if %IT(22 level) exceeds about 0.1%, RUL requires $\Delta J\leq 3$ for this transition; even if it were \approx 100%, the reduced transition probability would be unreasonably small if $\Delta J<3$.

[†] For absolute intensity per 100 decays, multiply by ≤ 1.0 .

[‡] Total theoretical internal conversion coefficients, calculated using the BrIcc code (**2008Ki07**) with Frozen orbital approximation based on γ -ray energies, assigned multiplicities, and mixing ratios, unless otherwise specified.

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Legend

Decay Scheme%IT \leq 100.0-----► γ Decay (Uncertain)