

$^{174}\text{Hf}(n,\gamma)$ E=thermal 1971AI01

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Full Evaluation	Jin Wu	NDS 206,1 (2025)	29-Oct-2024

1971AI01: The excited states of ^{175}Hf were produced via the thermal neutron capture reaction with a neutron flux of 3×10^{12} n/cm²/s in the target position, using a target isotopically enriched to ^{174}Hf (13.9%). The γ rays were detected by the Ge(Li) and NaI detectors. Measured E_γ , I_γ .

 ^{175}Hf Levels

E(level)&	J^π ^a	E(level)&	J^π ^a	E(level)&	J^π ^a	E(level)&	J^π ^a
0.0 [†]	5/2 ⁻	196.5 [‡] 7	3/2 ⁻	910.3 [#] 9	(3/2 ⁻)	1455.7 9	(1/2,3/2)
81.2 [†] 8	7/2 ⁻	373.9 17	7/2 ⁻	997.7 [@] 9	(1/2 ⁻ ,3/2 ⁻)	1642.8 13	(1/2,3/2)
125.9 [‡] 7	1/2 ⁻	866.9 [#] 7	(1/2 ⁻)	1375.1 11	(1/2,3/2)	(6708.9 7)	1/2 ⁺

[†] Band(A): 5/2⁻[512] band.

[‡] Band(B): 1/2⁻[521] band.

[#] Band(C): 1/2⁻[510]? band.

[@] Band(D): 3/2⁻[521]? band.

& From a least-squares fit to E_γ 's.

^a From band structures in 1971AI01.

 $\gamma(^{175}\text{Hf})$

E_γ	I_γ [†]	$E_i(\text{level})$	J^π_i	E_f	J^π_f
81.5&		81.2	7/2 ⁻	0.0	5/2 ⁻
115.7 20	0.87	196.5	3/2 ⁻	81.2	7/2 ⁻
125.7 10	18.6	125.9	1/2 ⁻	0.0	5/2 ⁻
177.4 15	1.2	373.9	7/2 ⁻	196.5	3/2 ⁻
197.0 [‡] 20	3.9	196.5	3/2 ⁻	0.0	5/2 ⁻
^x 342.6 10	0.56				
^x 420.0 10	0.20				
^x 439.5 15	1.1				
^x 441.5 15	0.48				
588.0 15	0.55	1455.7	(1/2,3/2)	866.9	(1/2 ⁻)
^x 665.0 [#] 20	0.3				
670.5 10	5.2	866.9	(1/2 ⁻)	196.5	3/2 ⁻
714.1 10	0.89	910.3	(3/2 ⁻)	196.5	3/2 ⁻
^x 745.0 10	0.30				
784.1 10	0.98	910.3	(3/2 ⁻)	125.9	1/2 ⁻
^x 813.0 10	1.0				
^x 859.4 15	0.83				
866.7 10	2.2	866.9	(1/2 ⁻)	0.0	5/2 ⁻
997.7 10	1.1	997.7	(1/2 ⁻ ,3/2 ⁻)	0.0	5/2 ⁻
^x 1072.0 20	1.0				
^x 1095.0 20	1.2				
1374.9 [@] 15	0.67 [@]	1375.1	(1/2,3/2)	0.0	5/2 ⁻
1374.9 [@] 15	0.67 [@]	1455.7	(1/2,3/2)	81.2	7/2 ⁻
1446.0 15	0.44	1642.8	(1/2,3/2)	196.5	3/2 ⁻
1455.4 15	0.88	1455.7	(1/2,3/2)	0.0	5/2 ⁻
1644.0 25	1.0	1642.8	(1/2,3/2)	0.0	5/2 ⁻
5066.5 [‡] 25	0.91	(6708.9)	1/2 ⁺	1642.8	(1/2,3/2)

Continued on next page (footnotes at end of table)

$^{174}\text{Hf}(\text{n},\gamma)$ E=thermal 1971AJ01 (continued) $\gamma(^{175}\text{Hf})$ (continued)

E_γ	$I_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	E_γ	$I_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π
5252.6 15	0.72	(6708.9)	1/2 ⁺	1455.7	(1/2,3/2)	5842.2 10	5.5	(6708.9)	1/2 ⁺	866.9	(1/2 ⁻)
5333.6 15	0.39	(6708.9)	1/2 ⁺	1375.1	(1/2,3/2)	^x 6348 3					
5711.1 20	0.31	(6708.9)	1/2 ⁺	997.7	(1/2 ⁻ ,3/2 ⁻)	6512.1 10	1.5	(6708.9)	1/2 ⁺	196.5	3/2 ⁻
5799.1 20	0.48	(6708.9)	1/2 ⁺	910.3	(3/2 ⁻)	6582.8 10	0.92	(6708.9)	1/2 ⁺	125.9	1/2 ⁻

[†] Primary γ 's normalized to $I_\gamma(6512\gamma)=1.5$, other γ 's normalized to $I_\gamma(670.5\gamma)=5.2$ based on absolute intensity measurements in 1969Gr41.

[‡] Doublet.

Uncertain transition.

@ Multiply placed with undivided intensity.

& Placement of transition in the level scheme is uncertain.

^x γ ray not placed in level scheme.

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Level Scheme

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

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)



