

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich	NDS 113, 157 (2012)	31-Dec-2010

$Q(\beta^-) = -8.41 \times 10^3$ 3; S(n)=8822 24; S(p)=2929 23; $Q(\alpha) = 5225$ 3 [2017Wa10](#)
 $Q(\varepsilon) = 6.86 \times 10^3$ 4; S(2n)=20092 24; S(2p)=4009 23; $Q(\varepsilon p) = 5869$ 19 [2017Wa10](#)

[Additional information 1.](#)

[Additional information 2.](#)

All data for the excited levels are from Pd($^{58}\text{Ni}, \text{xn}2\text{p}\gamma$) ([2000Di18](#)).

 ^{159}Hf LevelsCross Reference (XREF) Flags

A ^{163}W α decay
B Pd($^{58}\text{Ni}, \text{xn}2\text{p}\gamma$)

E(level)	J^π [†]	$T_{1/2}$	XREF	Comments
0	$7/2^-$	5.6 s 4	AB	$\% \alpha = 35$ 7; $\% \varepsilon + \% \beta^+ = 65$ 7 $\% \alpha$: from average of 41 5 (1979Ho10) and 27 6 (1978Ca11). In contrast, the calculations of 1997Mo25 give half-lives of 1.8 s for β decay and 200 s for α decay, which corresponds to $\% \alpha \approx 1$. Verification of the large measured value would be useful, especially since a recent measurement of the α branch intensity for ^{163}W , a parent of ^{159}Hf , is much smaller than the earlier values. $T_{1/2}$: Weighted average of 5.6 s 5 (1973To02) and 5.8 s 9 (1992Ha10), from ^{159}Hf α decay. J^π : from L=0 α decays in the $^{171}\text{Pt} \rightarrow ^{167}\text{Os} \rightarrow ^{163}\text{W}$ decay chain and on the systematics of the observed $13/2^+ \rightarrow 9/2^- \rightarrow 7/2^-$ cascades in these nuclides (2010Sc02).
98.87 [‡] 10	$9/2^-$		B	
635.68 [‡] 15	$13/2^-$		B	
1218.41 [‡] 19	$17/2^-$		B	
1837.19 [‡] 21	$21/2^-$		B	
2339.03 [‡] 24	$25/2^-$		B	
2949.1 [‡] 12	$29/2^-$		B	
3171.9 4			B	
3511.4 4			B	
3618.5 [‡] 12	$33/2^-$		B	
3813.6 4			B	
4276.6 [‡] 12	$37/2^-$		B	
4878.6 [‡] 12	$41/2^-$		B	
5597.7 12			B	
6274.2 12			B	
7009.8 12			B	

[†] From band structure proposed by [2000Di18](#). See the high-spin data set for related comments.

[‡] Band(A): Band based on $9/2^-$.

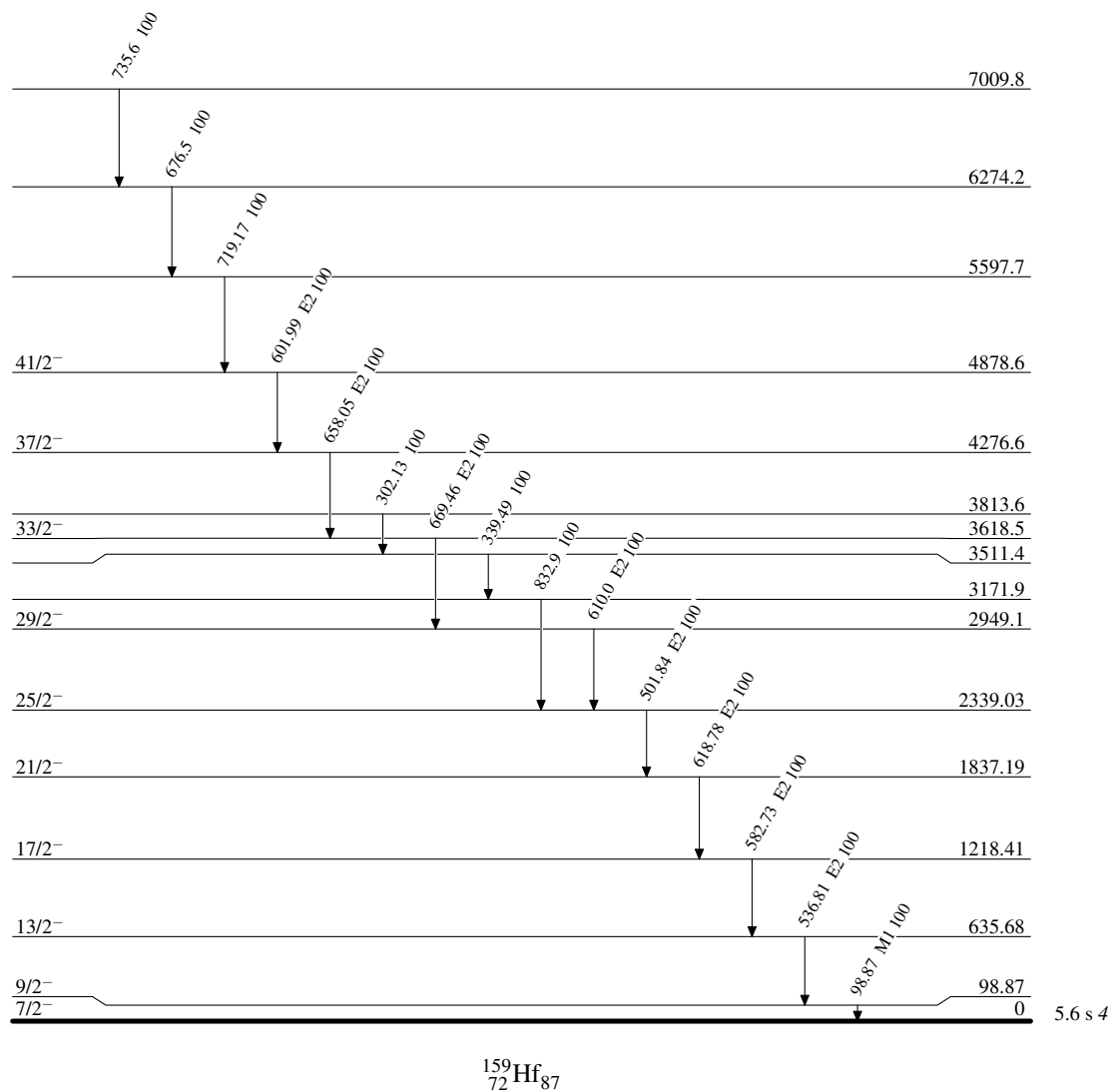
Adopted Levels, Gammas (continued) $\gamma(^{159}\text{Hf})$

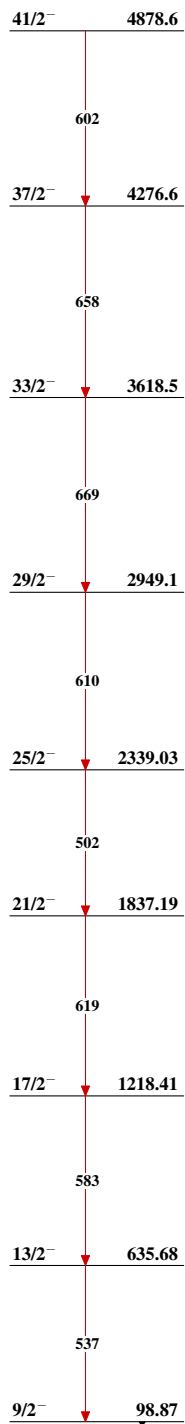
$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult. [†]
98.87	9/2 ⁻	98.87 10	100	0	7/2 ⁻	M1
635.68	13/2 ⁻	536.81 10	100	98.87	9/2 ⁻	E2
1218.41	17/2 ⁻	582.73 12	100	635.68	13/2 ⁻	E2
1837.19	21/2 ⁻	618.78 10	100	1218.41	17/2 ⁻	E2
2339.03	25/2 ⁻	501.84 11	100	1837.19	21/2 ⁻	E2
2949.1	29/2 ⁻	610.0 11	100	2339.03	25/2 ⁻	E2
3171.9		832.9 2	100	2339.03	25/2 ⁻	
3511.4		339.49 12	100	3171.9		
3618.5	33/2 ⁻	669.46 11	100	2949.1	29/2 ⁻	E2
3813.6		302.13 11	100	3511.4		
4276.6	37/2 ⁻	658.05 11	100	3618.5	33/2 ⁻	E2
4878.6	41/2 ⁻	601.99 12	100	4276.6	37/2 ⁻	E2
5597.7		719.17 14	100	4878.6	41/2 ⁻	
6274.2		676.5 2	100	5597.7		
7009.8		735.6 2	100	6274.2		

[†] From $\gamma(\theta)$ in the high-spin data set ([2000Di18](#)). See that data set for related comments.

Adopted Levels, GammasLevel Scheme

Intensities: Relative photon branching from each level



Adopted Levels, GammasBand(A): Band based on
 $9/2^-$  $^{159}_{72}\text{Hf}_{87}$