

**Adopted Levels, Gammas**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 200,2 (2025)	22-Aug-2022

S(n)=13500 *syst*; S(p)=1640 *syst*; Q(α)=3680 *syst* [2021Wa16](#)  
 ΔS(n)=420, ΔS(p)=340, ΔQ(α)=420 (*syst*,[2021Wa16](#)).  
 S(2p)=1040 340, Q(εp)=7140 360 (*syst*,[2021Wa16](#)).

[Additional information 1.](#)

The data on the excited states are all from the study of the <sup>154</sup>Hf IT decay ([1993Mc03](#),[1989Mc07](#)).

<sup>154</sup>Hf Levels

Cross Reference (XREF) Flags

- A <sup>154</sup>Hf IT decay (9 μs)
- B <sup>155</sup>Ta p decay
- C <sup>158</sup>W α decay (1.25 ms)
- D <sup>158</sup>W α decay (0.143 ms)

E(level) <sup>†</sup>	Jπ <sup>‡</sup>	T <sub>1/2</sub>	XREF	Comments
0	0 <sup>+</sup>	2 s 1	ABCD	%ε+%β <sup>+</sup> ≈100; %α≈0 T <sub>1/2</sub> : from growth and decay characteristics of its daughter, <sup>154</sup> Yb, in α decay studies ( <a href="#">1981Ho10</a> ). %ε+%β <sup>+</sup> : estimated by evaluator from failure to observe α decay ( <a href="#">1981Ho10</a> ) and the agreement of deduced half-life of 2 s with the estimate for ε+β <sup>+</sup> decay of 1-3 s ( <a href="#">1973Ta30</a> ). α systematics suggest %α≈2×10 <sup>-11</sup> . From theoretical calculations, <a href="#">1997Mo25</a> estimate T <sub>1/2</sub> =0.479 s.
1513	(2 <sup>+</sup> )		A	
2011	(3 <sup>-</sup> )		A	
2146	(5 <sup>-</sup> )		A	
2457	(7 <sup>-</sup> )		A	
2671	(8 <sup>+</sup> ) <sup>#</sup>		A	
2713	(10 <sup>+</sup> ) <sup>@</sup>	9 μs 4	A	%IT=100 T <sub>1/2</sub> : from γ(t) in the IT decay dataset ( <a href="#">1989Mc07</a> ).

<sup>†</sup> The ordering of the γ's and thus the level energies are based on the systematics of the levels in the lighter-mass N=82 nuclides <sup>148</sup>Dy, <sup>150</sup>Er and <sup>154</sup>Yb (see the <sup>154</sup>Hf IT decay data set).

<sup>‡</sup> Based on the systematics of the lighter-mass doubly even N=82 nuclides.

<sup>#</sup> Configuration=(π h<sub>11/2</sub>)<sup>6</sup>(π h<sub>11/2</sub>)<sup>2</sup><sub>8+</sub>, seniority=2.

<sup>@</sup> Configuration=(π h<sub>11/2</sub>)<sup>6</sup>(π h<sub>11/2</sub>)<sup>2</sup><sub>10+</sub>, seniority=2.

γ(<sup>154</sup>Hf)

E <sub>i</sub> (level)	J <sub>i</sub> <sup>π</sup>	E <sub>γ</sub>	E <sub>f</sub>	J <sub>f</sub> <sup>π</sup>	Mult.	α <sup>†</sup>	Comments
1513	(2 <sup>+</sup> )	1513	0	0 <sup>+</sup>			
2011	(3 <sup>-</sup> )	498	1513	(2 <sup>+</sup> )			
2146	(5 <sup>-</sup> )	135	2011	(3 <sup>-</sup> )			
2457	(7 <sup>-</sup> )	311	2146	(5 <sup>-</sup> )			
2671	(8 <sup>+</sup> )	214	2457	(7 <sup>-</sup> )			
2713	(10 <sup>+</sup> )	≈42	2671	(8 <sup>+</sup> )	[E2]	≈166	B(E2)(W.u.)=0.059 +44-19 E <sub>γ</sub> : 42 28 from <a href="#">1989Mc07</a> and based on systematics.

Continued on next page (footnotes at end of table)

**Adopted Levels, Gammas (continued)** $\gamma(^{154}\text{Hf})$  (continued)

<u><math>E_i(\text{level})</math></u>	<u><math>E_\gamma</math></u>	Comments
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B(E2)(W.u.): Uncertainty is only from  $T_{1/2}$  value.  
[Additional information 2.](#)

† [Additional information 3.](#)

**Adopted Levels, Gammas**Level Scheme