

^{159}W α decay **2011Sa59,1996Pa01,1981Ho10**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 160, 1 (2019)	21-Oct-2019

Parent: ^{159}W : $E=0.0$; $J^\pi=(7/2^-)$; $T_{1/2}=8.4$ ms 7; $Q(\alpha)=6450$ 4; $\% \alpha$ decay ≈ 99.5

^{159}W - J^π : suggested in 2011Sa59 based on their $7/2^-$ assignment of ^{155}Hf g.s. (see comment in Adopted Levels section): the reduced α -decay width of ^{159}W is compatible with an s-wave decay, indicating that the g.s. of ^{159}W is also $7/2^-$.

^{159}W - $T_{1/2}$: From 1996Pa01 report $T_{1/2}=8.2$ ms 7. 1981Ho10 report $T_{1/2}=7.3$ ms 27. 2019Hi06 report 10.3 ms +21-15. Weighted average of all values is 8.4 ms +7-6.

^{159}W - $Q(\alpha)$: From 2017Wa10.

^{159}W - $Q(\alpha)$: Additional information 1.

^{159}W - $\% \alpha$ decay: From the ratio of calculated half-lives for α and for $\varepsilon+\beta^+$ decay, as summarized in 1981HoZM. Calculated $T_{1/2}(\alpha)=5.5$ ms (near the observed $T_{1/2}$ value); calculated $T_{1/2}(\varepsilon+\beta^+)=1.2$ s. 1996Pa01 report $\% \alpha=92$ 23, while 1981HoZM quote $\% \alpha=200$ 120.

Additional information 2.

Data set includes the XUNDL compilation, by W. D. Kulp (NNDC, BNL) from 2011Sa59.

2011Sa59: source material produced in the reaction $^{106}\text{Cd}(^{58}\text{Ni}, p3n\gamma)$. Reaction products separated using recoil ion transport unit (RITU) gas-filled separator and implanted into DSSDs in the Gamma Recoil Electron Alpha Tagging (GREAT) spectrometer. Measured α , protons, α and delayed α correlations. Characteristic alpha decay of the ^{159}W ground state and anti-coincidence with any decay within 20 ms after the initial decay observed population of both $11/2^-$ and $1/2^+$ states in ^{155}Lu .

1996Pa01: source material produced in heavy-ion fusion reactions followed by separation in a recoil mass separator and analysis using a double-sided Si strip detector.

1981HoZM: Sources produced in heavy-ion induced reactions followed by velocity separation and implantation into position-sensitive Si detector array.

 ^{155}Hf Levels

E(level)	J^π	$T_{1/2}$	Comments
0.0	(7/2 ⁻)	843 ms 30	$J^\pi, T_{1/2}$: from Adopted Levels dataset.

 α radiations

E_α	E(level)	I_α^\ddagger	HF^\dagger	Comments
6295 5	0.0	100	1.96 18	E_α : weighted average of 6292 5 (1996Pa01) and 6299 6 (1981Ho10).

[†] The nuclear radius parameter $r_0(^{155}\text{Hf})=1.5566$ 82 is deduced from interpolation (or unweighted average) of radius parameters of the adjacent even-even nuclides.

[‡] For absolute intensity per 100 decays, multiply by ≈ 0.995 .