

^{163}W α decay

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

Parent: ^{163}W : $E=0$; $J^\pi=7/2^-$; $T_{1/2}=2.67$ s 10; $Q(\alpha)=5519$ 5; $\% \alpha$ decay=14 2

^{163}W - $Q(\alpha)$: computed from $E\alpha=5384$ 5, assuming that the α transition connects the two ground states. [2009AuZZ](#) and [2003Au03](#) list $Q(\alpha)=5520$ 50, with the quoted uncertainty introduced to account for the possibility that the α transition feeds an excited state rather than the ^{159}Hf g.s.

^{163}W - $T_{1/2}$: from ^{163}W Adopted Levels ([2010Re03](#)). Value is a weighted average of: 2.6 s 1 ([2010Sc02](#)); 3.0 s 10 ([1996Pa01](#)); 3.0 s 2 ([1979Ho10](#)); and 2.5 s 3 ([1973Ea01](#)).

^{163}W - J^π : from ^{163}W Adopted Levels, based on $L=0$ 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](#)).

^{163}W - $\% \alpha$ decay: from ^{163}W Adopted Levels ([2010Re03](#)), from an average of $\% \alpha=13$ 2 ([1996Pa01](#)) and $\% \alpha=15$ 2 ([2010Sc02](#)). Earlier references give much larger values, namely, 41 5 ([1979Ho10](#)), 36 6 ([1978Ca11](#)), and ≈ 50 ([1973Ea01](#)). The calculations of [1997Mo25](#) give $T_{1/2}(\beta)=1.9$ s and $T_{1/2}(\alpha)=24$ s, which corresponds to $\% \alpha=8$, in good agreement with the new measurements.

Additional information 1.

[1973Ea01](#): $^{144,147}\text{Sm}(^{24}\text{Mg},\text{xn})$, excitation functions measured from 110 to 205 MeV.

[1975To05](#): $^{156}\text{Dy}(^{16}\text{O},\text{xn})$.

[1979Ho10](#): $\text{Ag}(^{58}\text{Ni},\text{xn})^{163}\text{Re}(\varepsilon)$ and separation in velocity filter.

[1982De11](#): ^{63}Cu bombardment of various targets.

[1983Fa03](#): ^{208}Pb bombardment of uranium targets.

[1996Pa01](#): ^{163}W produced in heavy-ion fusion reactions followed by separation of fragments by recoil-mass separator.

[2010Sc02](#): ^{163}W produced in the α -decay chain headed by ^{171}Pt , as well as in the $^{106}\text{Cd}(^{60}\text{Ni},2\text{pny})$, $E(^{60}\text{Ni})=270$ MeV, and the $^{92}\text{Mo}(^{78}\text{Kr},\alpha 2\text{pny})$, $E(^{78}\text{Kr})=380$ MeV, reactions. The information listed here is from the α -decay-related study. For the experimental details, see, e.g., the high-spin data set in the evaluation of the data for ^{163}W ([2010Re03](#)).

 ^{159}Hf Levels

E(level)	J^π
0.0	$7/2^-$

 α radiations

$E\alpha$	E(level)	Comments
5384 [†] 5	0.0	$E\alpha$: Unweighted average of 5385 5 (1973Ea01), 5384 10 (1975To05), 5384 5 (1979Ho10), 5384 3 (1982De11), 5383 6 (1996Pa01). Uncertainty is assigned as 5 keV, based on the value of the majority of the measurements. It is assumed that this transition feeds the ^{159}Hf g.s.

[†] Existence of this branch is questionable.