

^{164}W α decay

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 176, 1 (2021)	1-May-2021

Parent: ^{164}W : E=0.0; $J^\pi=0^+$; $T_{1/2}=6.3$ s 2; $Q(\alpha)=5278.3$ 20; $\% \alpha$ decay=3.8 12

Additional information 1.

α -related data are taken from the evaluation of 2021Si16.

$T_{1/2}(^{164}\text{W})=6.0$ s 3, the weighted average of 6.3 s 5 (1973Ea01), 5.5 s 5 (1975To05) and 6.4 s 8 (1979Ho10) and 6.44 s 17 (1994TeZZ) is used in calculations of the r_0 parameter.

$\% \alpha=3.8$ 12 is obtained from the experimental α branchings of 2.6% 17 (1979Ho10) and 5% 1 (1996Pa01). The calculated r_0 parameters are 1.548 for $\% \alpha=2.6$ and 1.582 for $\% \alpha=5.0$. Since both of the r_0 values can be said to fit the systematics, an unweighted average of $\% \alpha=3.8$ 12 is used here. It should be noted, however, that $r_0=1.548$ fits the r_0 systematics better than $r_0=1.582$ does, favoring $\% \alpha=2.6$ 17.

$Q(\alpha)(^{164}\text{W})=5278.3$ 20 is from 2021Wa16.

 ^{160}Hf Levels

E(level)	J^π
0.0	0^+

 α radiations

$E\alpha$	E(level)	$I\alpha^\ddagger$	HF †	Comments
5149.6 23	0.0	100	1.000	$E\alpha=5149.8$ 23 was recommended by 1991Ry01 from the measured energies of 5153 5 (1973Ea01), 5146 5 (1975To05) and 5150 3 (1982De11). $E\alpha=5148$ 6, measured by 1996Pa01, agrees well with the previous values. The weighted average of these $E\alpha$'s becomes 5149.6 23. $I\alpha$: only one α group was observed. An upper limit of 1.09% of α decay is calculated for an unobserved 4769.7-keV α to the 2^+ state at 389.6 keV in ^{160}Hf by requiring $\text{HF}(4769.7\alpha)>1$.

† The nuclear radius parameter $r_0(^{160}\text{Hf})=1.565$ 18 is deduced by assuming $\text{HF}=1.0$ for the ground-state to ground-state alpha decay branch.

‡ For absolute intensity per 100 decays, multiply by 0.038 12.