

^{194}Po α decay (0.392 s) 1993Wa04,1994Wa13,1989De18

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, ¹ and Jun Chen ²		NDS 169, 1 (2020)	15-Oct-2020

Parent: ^{194}Po : $E=0.0$; $J^\pi=0^+$; $T_{1/2}=0.392$ s 4; $Q(\alpha)=6987$ 3; $\% \alpha$ decay=93 7

^{194}Po - $T_{1/2}$: From ^{194}Po Adopted Levels in the ENSDF database (April 2006 update). Other: 0.34 s +11-7 (2014Ka23).

^{194}Po - $Q(\alpha)$: From 2017Wa10.

^{194}Po - $\% \alpha$ decay: $\% \alpha=93$ 7 for ^{194}Po decay was obtained by M. Leino, Ph.D. Thesis (1983), as quoted in reference 19 of 1993Wa04. Other: $\% \alpha > 88\%$, estimated by 2014Ka23 from their α data.

1993Wa04 (also 1994Wa13,1989De18): ^{194}Po source was produced in the reaction of 240 MeV Ne beam on ^{182}W target at the Leuven Isotope Separator On-Line (LISOL) facility. Measured $E\alpha$, $I\alpha$, half-life of ^{194}Po decay.

Others: 2005Uu02, 2005Uu03, 1985Va03, 1981Le23, 1977De32, 1967Si09, 1967Tr06.

 ^{190}Pb Levels

E(level)	J^π	$T_{1/2}$	Comments
0.0	0^+		
658 4	0^+	≤ 0.22 ns	E(level): from ce data (1989De18). $T_{1/2}$: from $(\alpha)(\text{ce})(t)$ (1989De18).
774	2^+		E(level): rounded value from the Adopted Levels.

 α radiations

$E\alpha$	E(level)	$I\alpha^{\dagger\#}$	HF ‡	Comments
(6085 4)	774			$E\alpha$: α transition has not been observed. $E\alpha$ is deduced from $Q(\alpha)=6987$ 3 and $E(\text{level})=773.8$ 5. The calculations by using hindrance factor of $\text{HF}>1$ yield $I\alpha(6085\alpha)<0.10$.
6194 7	658	0.24 3	1.27 19	$E\alpha$: measurement of 1989De18. $E\alpha=6191$ 7 was measured by 1985Va03. Other $E\alpha=6194$ keV (2002Va13, 1994Wa13). $I\alpha$: 0.22 (2002Va13).
6843 3	0.0	99.71 6	1.0	$E\alpha$: the measured energies are $E\alpha=6843$ 14 (2005Uu02,2005Uu03), 6842 6 (1993Wa04), 6846 (1985Va03), 6840 (1977De32), 6847 10 (1967Si09) and 6846 7 (1967Tr06; energy is increased by 1 keV due to a change in calibration energy, as recommended by 1991Ry01). $Q(\alpha)(^{194}\text{Po})=6987$ 3 yields $E\alpha=6843$ 3. See also 2002Va13 for 6842 α line from ^{194}Po decay.

[†] Intensities per 100 α decays are deduced from $I\alpha(6843)/I\alpha(6194\alpha)=93/0.22$ measured by 1994Wa13 (also 1995Bi12), and from the expectation of $I\alpha=0.05$ 5 (<0.10), obtained from $\text{HF}(\text{unobserved } 6085\alpha)>1$. The uncertainties in $I\alpha$ values are obtained from the uncertainty calculated by 1994Wa13 for $\text{HF}(6194\alpha)$.

[‡] Deduced using $r_0(^{190}\text{Pb})=1.5113$ fm 39, deduced by evaluators from assumed $\text{HF}(\text{g.s. to g.s. } \alpha \text{ transition})=1.0$.

[#] For absolute intensity per 100 decays, multiply by 0.93 7.

 $\gamma(^{190}\text{Pb})$

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	Comments
658	658	0^+	0.0	0^+	E0	E_γ : implied from $\alpha(\text{ce})$ -coin data in 1989De18.

Decay Scheme

