

^{218}Pa α decay (0.13 ms) 2020Zh01

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Shaofei Zhu and E. A. Mccutchan		NDS 175, 1 (2021)	1-May-2021

Parent: ^{218}Pa : $E=83\ 6$; $J^\pi=(1^-)$; $T_{1/2}=0.13\ \text{ms} +6-3$; $Q(\alpha)=9791\ 12$; $\% \alpha$ decay=100.0

^{218}Pa -E: from $Q(\alpha)(^{218\text{m}}\text{Pa}-^{214\text{g}}\text{Ac})-Q(\alpha)(^{218\text{g}}\text{Pa}-^{214\text{g}}\text{Ac})$.

^{218}Pa - $Q(\alpha)$: from 2021Wa16.

^{218}Pa - $T_{1/2}$: from 2020Zh01.

^{218}Pa - J^π : based on systematics (2020Zh01).

2020Zh01: $^{218\text{m}}\text{Pa}$ was produced in $^{182}\text{W}(^{40}\text{Ar},1\text{p}3\text{n})$ reaction with a beam at 190 MeV at HIRFL, China; evaporation residues (ER) were separated in-flight by the SHANS gas-filled separator and implanted into PSSD silicon detectors at the focal plane. γ rays from the decay were detected by a clover detector with four HPGe crystals and two single crystal HPGe detectors. $E\alpha$, $I\alpha$ and $T_{1/2}$ were measured by ER- α - α time and position correlations.

 ^{214}Ac Levels

E(level) [†]	J^π [†]	$T_{1/2}$	Comments
0.0	5 ⁽⁺⁾	8.2 s 2	$T_{1/2}$: from the Adopted Levels.
91.8 4	(4 ⁺)		

[†] From the Adopted Levels.

 α radiations

$E\alpha$ [†]	E(level)	$I\alpha$ [#]	HF [‡]	Comments
9596 21	91.8	<10	>863.3	$E\alpha$: from 2020Zh01, tentatively assigned based on α - γ correlation with probability of being random less than 2×10^{-3} . $I\alpha$: estimated by evaluators from 9 ER- α 1 correlation events and 1 α - γ event observed in 2020Zh01.
9691 15	0.0	>90	<423	$E\alpha$: from 2020Zh01, based on ER- α 1- α 2 correlation with α 2 as ^{214}Ac decay. The probability of being random is less than 3×10^{-27} . $I\alpha$: estimated by evaluators from 9 ER- α 1 correlation events and 1 α - γ event observed in 2020Zh01.

[†] From 2020Zh01.

[‡] Using $r_0(^{214}\text{Ac})=1.510\ 23$ from unweighted average of $r_0(^{212}\text{Ra})=1.4695\ 14$, $r_0(^{214}\text{Ra})=1.5487\ 30$ and $r_0(^{214}\text{Th})=1.512\ 14$ (2020Si16). No data on $r_0(^{216}\text{Th})$ available.

[#] Absolute intensity per 100 decays.

 $\gamma(^{214}\text{Ac})$

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
92.2	91.8	(4 ⁺)	0.0	5 ⁽⁺⁾	E_γ : from (2020Zh01).

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