

^{210}Ra α decay **2003He06,1967Va22**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 201,346 (2025)	21-Jan-2025

Parent: ^{210}Ra : $E=0.0$; $J^\pi=0^+$; $T_{1/2}=3.9$ s *1*; $Q(\alpha)=7151$ *3*; % α decay \approx 100

^{210}Ra - $T_{1/2}$: Weighted average of 4.0 s *1* (2008Ha12), 3.8 s *2* (1967Va22) and 3.6 s *2* (1968Lo15). Others: 4.3 s *+5-4* (2022Zh45), 6.6 s *+317-30* and 1.4 s *+67-6* (2015Ma37).

^{210}Ra - $Q(\alpha)$: From 2021Wa16.

2003He06: Source produced using $^{204}\text{Pb}(^{12}\text{C},6n)$ reaction. Projectile: $E(^{12}\text{C})=78$ -110 MeV, beam intensity 100-200 pA. Target: enriched to 99.73% ^{204}Pb , 0.45 mg/cm² thick, evaporated on carbon layers of 0.04 mg/cm² (upstream) and covered with 0.005 mg/cm² carbon (downstream), mounted on a rotating wheel (50 Hz repetition frequency) and synchronized with the beam time macro structure. Detectors: velocity filter SHIP, position sensitive 16-strip detector (PIPS) with a typical resolution of 20-24 keV. HPGe detector located behind PIPS. Measured: $E\alpha$, $I\alpha$; $E\alpha$ - $E\gamma$ correlations.

1967Va22: Source produced using $^{197}\text{Au}(^{19}\text{F},6n)$ and $^{206}\text{Pb}(^{12}\text{C},8n)$ reactions. Projectiles: $E(^{19}\text{F})=197$ MeV and $E(^{12}\text{C})=125$ MeV. Targets: ^{197}Au , 2.5 mg/cm² thick and enriched to 97.22% ^{206}Pb , 0.3 mg/cm² thick. Detectors: Si (Au) surface barrier detectors. Measured: $E\alpha$, $I\alpha$, $T_{1/2}$.

 ^{206}Rn Levels

E(level)	J^π	$T_{1/2}$	Comments
0.0	0^+	5.67 min <i>17</i>	$T_{1/2}$: From Adopted Levels.
575.30 <i>10</i>	2^+		

 α radiations

$E\alpha$	E(level)	$I\alpha^\ddagger$	HF †	Comments
6452 <i>3</i>	575.30	≈ 0.03	≈ 21	$E\alpha$: From $Q(\alpha)$ and the excitation energy of the 2^+ level. Other: 6447 keV <i>5</i> (2003He06). $I\alpha$: From 2003He06.
7014 <i>4</i>	0.0	≈ 99.97	≈ 1	$E\alpha$: Weighted average of 7019 keV <i>5</i> (1967Va22), 7010 keV <i>8</i> (2007Le14), 7003 keV <i>10</i> (2003He06) and 7006 keV <i>14</i> (2022Zh45). Others: 7010 keV <i>30</i> (1997Mi03), 6968 keV <i>25</i> and 6983 keV <i>25</i> (2015Ma37). $I\alpha$: From 2003He06.

† $r_0(^{206}\text{Rn})=1.4885$ *17*, from HF(7014 α)=1.0.

‡ For absolute intensity per 100 decays, multiply by ≈ 1.00 .

 $\gamma(^{206}\text{Rn})$

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
574.9 <i>1</i>	575.30	2^+	0.0	0^+	E_γ : From 2003He06.

^{210}Ra α decay 2003He06,1967Va22Decay Scheme