

**URANIUM 238 TO LEAD 206 DECAY SERIES**—Two additional charts of the decay series of uranium 238

ISOTOPE	HALF-LIFE	EMMISSION
Uranium 238	$4.55 \times 10^9$ years	Alpha
Thorium 234	24.1 days	Beta
Protactinium 234	1.14 minute	Beta
Uranium 234	235,000 years	Alpha
Thorium 230	80,000 years	Alpha
Radium 226	1,660 years	Alpha
Radon 222	3.85 days	Alpha
Polonium 218	3.05 minutes	Alpha
Lead 214	26.8 minutes	Beta
Bismuth 214	19.7 minutes	Beta
Polonium 214	$15 \times 10^{-6}$ seconds	Alpha
Lead 210	2.22 years	Beta
Bismuth 210	4.97 days	Beta
Polonium 210	139 days	Alpha
Lead 206	stable	none

Element	Nuclide	Mode of decay	Half-life
Uranium I	$U^{238}$	$\alpha$	$4.47 \times 10^9$ y
Uranium X1	$Th^{234}$	$\beta^-$	24.10 d
Uranium X2	$Po^{234m}$	$\beta^-$	1.175 m
	$Po^{234}$	$\beta^-$	6.66 h
Uranium II	$U^{234}$	$\alpha$	$2.48 \times 10^5$ y
Ionium	$Th^{230}$	$\alpha$	$7.52 \times 10^4$ y
Radium	$Ra^{226}$	$\alpha$	1622 y
Radium emanation, radon, niton	$Rn^{222}$	$\alpha$	3.82 d
Radium A	$Po^{218}$	$\alpha, \beta^-$	3.05 m
$\alpha$ (99.98%)	Radium B	$\beta^-$	$Pb^{214}$ 26.8 m
$\beta^-$ (0.02%)	Astatine	$\alpha, \beta^-$	$At^{218}$ 1.5–2 s
$\alpha$ (99.9%)	Radium C	$\beta^-$	$Bi^{214}$ $\beta^-, \alpha$ 19.7 m
$\beta^-$ (0.1%)	Radon	$\alpha$	$Rn^{218}$ $\alpha$ 0.019 s
$\alpha$ (0.04%)	Radium C'	$\alpha$	$Po^{214}$ $\alpha$ $1.64 \times 10^{-4}$ s
$\beta^-$ (99.96%)	Radium C''	$\beta^-$	$Tl^{210}$ $\beta^-$ 1.32 m
	Radium D	$\beta^-$	$Pb^{210}$ $\beta^-$ 19.4 y
	Radium E	$\beta^- \alpha$	$Bi^{210}$ $\beta^- \alpha$ 5.01 d
$\alpha$ ( $5 \times 10^{-5}\%$ )	Thallium	$\beta^-$	$Tl^{206}$ $\beta^-$ 4.19 m
$\beta^-$ (99+%)	Radium F	$\alpha$	$Po^{210}$ $\alpha$ 138.4 d
	Radium G	stable	$Pb^{206}$ stable —