

13.1: Appendix E - Half-Lives for Several Isotopes

Half-Lives for Several Radioactive Isotopes

Isotope	Half-Life ¹	Type of Emission ²	Isotope	Half-Life ³	Type of Emission ⁴
$^{14}_6\text{C}$	5730 y	(β^-)	$^{210}_{83}\text{Bi}$	5.01 d	(β^-)
$^{13}_7\text{N}$	9.97 m	(β^+)	$^{212}_{83}\text{Bi}$	60.55 m	(α or β^-)
$^{15}_9\text{F}$	4.1×10^{-22} s	(p)	$^{210}_{84}\text{Po}$	138.4 d	(α)
$^{24}_{11}\text{Na}$	15.00 h	(β^-)	$^{212}_{84}\text{Po}$	3×10^{-7} s	(α)
$^{32}_{15}\text{P}$	14.29 d	(β^-)	$^{216}_{84}\text{Po}$	0.15 s	(α)
$^{40}_{19}\text{K}$	1.27×10^9 y	(β or $E. C.$)	$^{218}_{84}\text{Po}$	3.05 m	(α)
$^{49}_{26}\text{Fe}$	0.08 s	(β^+)	$^{215}_{85}\text{At}$	1.0×10^{-4} s	(α)
$^{60}_{26}\text{Fe}$	2.6×10^6 y	(β^-)	$^{218}_{85}\text{At}$	1.6 s	(α)
$^{60}_{27}\text{Co}$	5.27 y	(β^-)	$^{220}_{86}\text{Rn}$	55.6 s	(α)
$^{87}_{37}\text{Rb}$	4.7×10^{10} y	(β^-)	$^{222}_{86}\text{Rn}$	3.82 d	(α)
$^{90}_{38}\text{Sr}$	29 y	(β^-)	$^{224}_{88}\text{Ra}$	3.66 d	(α)
$^{115}_{49}\text{In}$	5.1×10^{15} y	(β^-)	$^{226}_{88}\text{Ra}$	1600 y	(α)
$^{131}_{53}\text{I}$	8.040 d	(β^-)	$^{228}_{88}\text{Ra}$	5.75 y	(β^-)
$^{142}_{58}\text{Ce}$	5×10^{15} y	(α)	$^{228}_{89}\text{Ac}$	6.13 h	(β^-)
$^{208}_{81}\text{Tl}$	3.07 m	(β^-)	$^{228}_{90}\text{Th}$	1.913 y	(α)
$^{210}_{82}\text{Pb}$	22.3 y	(β^-)	$^{232}_{90}\text{Th}$	1.4×10^{10} y	(α)
$^{212}_{82}\text{Pb}$	10.6 h	(β^-)	$^{233}_{90}\text{Th}$	22 m	(β^-)
$^{214}_{82}\text{Pb}$	26.8 m	(β^-)	$^{234}_{90}\text{Th}$	24.10 d	(β^-)
$^{206}_{83}\text{Bi}$	6.243 d	($E. C.$)	$^{233}_{91}\text{Pa}$	27 d	(β^-)
$^{233}_{92}\text{U}$	1.59×10^5 y	(α)	$^{242}_{96}\text{Cm}$	162.8 d	(α)
$^{234}_{92}\text{U}$	2.45×10^5 y	(α)	$^{243}_{97}\text{Bk}$	4.5 h	(α or $E. C.$)
$^{235}_{92}\text{U}$	7.03×10^8 y	(α)	$^{253}_{99}\text{Es}$	20.47 d	(α)
$^{238}_{92}\text{U}$	4.47×10^9 y	(α)	$^{254}_{100}\text{Fm}$	3.24 h	(α or $S. F.$)
$^{239}_{92}\text{U}$	23.54 m	(β^-)	$^{255}_{100}\text{Fm}$	20.1 h	(α)
$^{239}_{93}\text{Np}$	2.3 d	(β^-)	$^{256}_{101}\text{Md}$	76 m	(α or $E. C.$)
$^{239}_{94}\text{Pu}$	2.407×10^4 y	(α)	$^{254}_{102}\text{No}$	55 s	(α)
$^{239}_{94}\text{Pu}$	6.54×10^3 y	(α)	$^{257}_{103}\text{Lr}$	0.65 s	(α)
$^{241}_{94}\text{Pu}$	14.4 y	(α or β^-)	$^{260}_{105}\text{Ha}$	1.5 s	(α or $S. F.$)
$^{241}_{95}\text{Am}$	432.2 y	(α)	$^{263}_{106}\text{Sg}$	0.8 s	(α or $S. F.$)

Footnotes

1. ¹ y = years, d = days, h = hours, m = minutes, s = seconds
2. ² $E.C.$ = electron capture, $S.F.$ = Spontaneous fission
3. ³ y = years, d = days, h = hours, m = minutes, s = seconds

4. ⁴*E.C.* = electron capture, *S.F.* = Spontaneous fission