

## Uranium decay

Natural uranium consists of:

Isotope	Half-life	Abundance
234	$2.455 \times 10^5$ years	0.000054
238	$4.468 \times 10^9$ years	0.992742
235	$0.7038 \times 10^9$ years	0.007204

Number of disintegrations per second for one gram of natural uranium.

$$|dn| = n \times \log 2 \times \frac{1}{T} dt \quad dt = \text{one second}$$

Contribution of isotope 238:

$$\begin{aligned} |dn_1| &= \frac{0.992742 \times 6.023 \times 10^{23}}{238} \times 0.6931 \times \frac{1}{4.468 \times 10^9 \times 365 \times 24 \times 3600} \\ &= 12358 \end{aligned}$$

Contribution of isotope 235:

$$\begin{aligned} |dn_2| &= \frac{0.007204 \times 6.023 \times 10^{23}}{235} \times 0.6931 \times \frac{1}{0.7038 \times 10^9 \times 365 \times 24 \times 3600} \\ &= 577 \end{aligned}$$

Contribution of isotope 234:

$$\begin{aligned} |dn_3| &= \frac{0.000054 \times 6.023 \times 10^{23}}{234} \times 0.6931 \times \frac{1}{2.455 \times 10^5 \times 365 \times 24 \times 3600} \\ &= 12443 \end{aligned}$$

Total: 25378 decays per second per gram of natural uranium.

Reference: Nuclear Wallet Cards, January 2000, Brookhaven National Laboratory, Upton, New-York, U.S.A.