

Answer on Question #48319 - Chemistry – Other

Question

After 24.0 days, 2.00 milligrams of an original 128.0 milligram sample remains. What is the half-life of the sample?

Answer:

Half-life is a time required for one half the atoms of a radioactive nuclide to decay.

Let's find out the number of half-lives in 24.0 days:

$$128.0 (1/2)^n = 2.00$$

$$(1/2)^n = 0.015625$$

$$n \log 0.5 = \log 0.015625$$

$$n = \log 0.5 / \log 0.015625$$

$$n = 6$$

If 24.0 days have 6 half-lives, then the length of the half-life is:

$$24 \text{ days} / 6 \text{ half-lives} = 4.00 \text{ days}$$

Answer: 4.00 days