

$$t_{1/2} = 3.82 \text{ days}$$

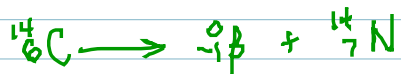
What is the initial reaction rate if we start with 4.6g ${}^{222}\text{Rn}$?

$$\text{rate} = k (4.6g \text{ } {}^{222}\text{Rn}) \quad t_{1/2} = \frac{0.693}{k}$$

$$k = \frac{0.693}{t_{1/2}} = \frac{0.693}{3.82 \text{ days}} = 0.18 \text{ days}^{-1}$$

$$\text{rate} (0.18 \text{ d}^{-1})(4.6g) = 0.83 \text{ g/day}$$

RADIOISOTOPIC DATING

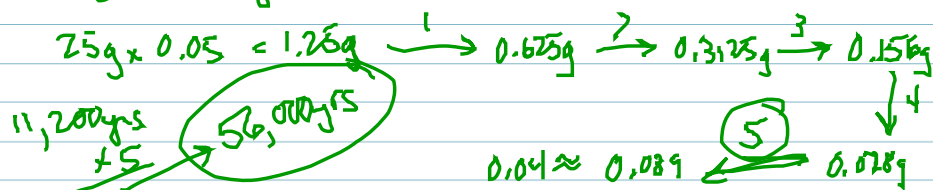


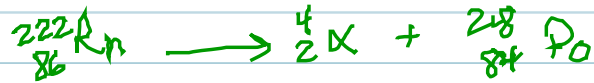
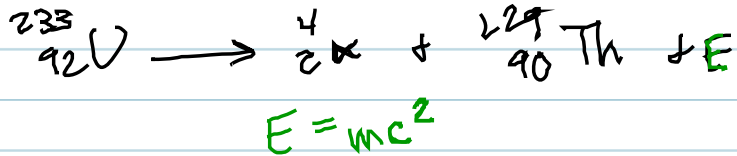
radioisotope $\xrightarrow{\text{time}}$ stable atom

5% radioisotope upon formation 95% stable

25g sample studied \rightarrow 0.04g radioisotope today

$$t_{1/2} = 11,200 \text{ yrs}$$





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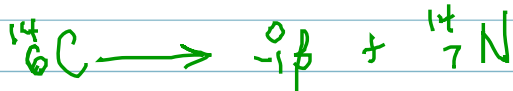
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RADIOISOTOPIC DATING



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$$25g \times 0.05 = 1.25g \xrightarrow{1} 0.625g \xrightarrow{2} 0.3125g \xrightarrow{3} 0.156g$$

$$11,200 \text{ yrs} \times 5 \rightarrow 56,000 \text{ yrs}$$

$$0.156g \xrightarrow{4} 0.078g$$

5

$$0.04 \approx 0.089$$