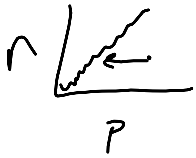
21/ (12a) $^{191}_{79}Au + ^{0}_{-1}e \rightarrow ^{191}_{78}Pt$



$^{201}_{79}Au \rightarrow ^{201}_{80}Hg + ^{0}_{-1}e$

$^{105}_{45}Rh$

n : p

60 : 45

1.3 : 1

Apr 21-7:40 AM

21/30

$^{238}_{92}U\,(n,\gamma)\,^{239}_{92}U$

$^{238}_{92}U + ^{1}_{0}n \rightarrow ^{0}_{0}\gamma + ^{239}_{92}U$

Artificial

Apr 21-7:53 AM

Nuclear   1st order rxn

$$\ln A_t = -kt + \ln A_0$$

- $\ln A_t$: What's left at that time "t"
- k: rate constant
- t: time
- rate constant and time: Same time units
- A_0: Initial amount

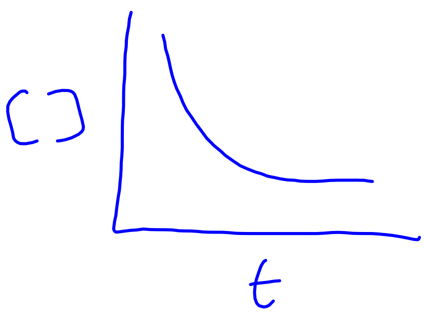
$$\ln \frac{A_t}{A_0} = -kt$$

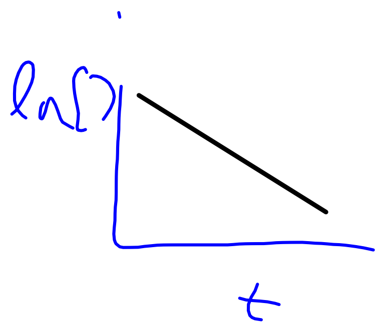
Half life - time for ½ substance to decay.

1° :

$$t_{1/2} = \frac{0.693}{k}$$

Apr 21-8:03 AM





Apr 21-8:09 AM

(a) start 1g ^{90}Sr, 0.953g remains after 2yrs.

(a) $t_{1/2} = ?$

$$\ln A_t = -Kt + \ln A_0$$

$$\ln(0.953) = -K(2) + \ln 1$$

$$K = 0.024\ yr^{-1}$$

$$t_{1/2} = \frac{0.693}{K} = 28.8\ yr$$

(b) how much ^{90}Sr remains after 5yrs.

$$\ln A_t = -Kt + \ln A_0$$

$$\ln A_t = (-0.024)(5) + \ln 1$$

$$A_t = 0.887g$$

Apr 21-8:10 AM

ROCK ⇒ $\frac{0.257mg\ ^{206}Pb}{1mg\ ^{238}U}$ $4.5 \times 10^9\ yrs = t_{1/2}$

How OLD?

$$\ln A_t = -Kt + \ln A_0$$
$$= (-1.54 \times 10^{-10})t + \ln 1$$

$$\frac{t_{1/2}}{1} = \frac{0.693}{K}$$

$$\frac{K}{1} = \frac{0.693}{t_{1/2}} = 1.54 \times 10^{-10}\ yr^{-1}$$

$^{238}U \rightarrow U + Pb$

START 1.297 $1 + 0.257\left(\frac{238}{206}\right)$

Pb → U

MASS RATIO

Have 1mg U now

1mg U (now) + 0.257mg Pb

$0.257 \times \frac{238U}{206Pb}$

0.297mg U transmutated

Apr 21-8:20 AM

21/34, 36, 40

Apr 21-8:28 AM