

$1^{\circ}$   
 $\ln[A]$  vs time graph showing an exponential decay curve. A red box above it contains  $Y = mx + b$ .

$$y = mx + b$$

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

end                      start

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

$2^{\circ}$   
 $\frac{1}{[A]}$  vs time graph showing a linear increase curve.

$$\frac{1}{[A]_{end}} = Kt + \frac{1}{[A]_{start}}$$

$$t_{1/2} = \frac{1}{k[A]_0}$$

K and t must have same units of time

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(14.24) (a) Rate =  $k [A]^1 [B]^0 [C]^2$

Rate =  $k [A]^1 [C]^2$

$10^1$        $10^0$   
 $10^2$

$3^1$     $3^0$     $3^2$   
 $(27)^3$

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(14.32)

$$\text{Rate} = k [\text{NO}]^2 [\text{O}_2]$$

$\begin{matrix} 1 \rightarrow 2 & & 2 \rightarrow 3 \\ \frac{\text{NO}}{2} = \frac{\text{rate}}{4} & \left. \vphantom{\frac{\text{NO}}{2}} \right\} & \frac{\text{O}_2}{2} = \frac{\text{rate}}{2} \end{matrix}$

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$\text{Rate} = k (A)^3$   
 $\frac{\text{m}^3}{\text{sec}} = k \frac{\text{m}^3}{\text{m}^3}$

$k = \frac{1}{\text{m}^3 \cdot \text{sec}}$

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$k = \frac{1.45}{\text{yr}}$

$5 \times 10^{-7} \text{ g/cm}^3 \text{ A}_0$   
 $1 \text{ yr from Now A}_t$

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