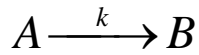


1. First-order reacti



請求：

$$[A]_t = ?$$

$$t_{\frac{1}{2}} = ?$$

ANS :

(1)

$$\frac{d[A]}{dt} = -k[A]$$

$$\int \frac{1}{[A]} d[A] = -\int k dt + c$$

$$\ln[A] = -kt + c$$

$$[A] = e^c e^{-kt}$$

初始濃度： $[A]_0 = A_0$, $[A] = A_0 e^{-kt}$

(2)

$$t_{\frac{1}{2}} = ?$$

$$\frac{1}{2}[A]_0 = A_0 e^{-kt/2}$$

$$-\ln 2 = -kt_{\frac{1}{2}}$$

$$t_{\frac{1}{2}} = \frac{\ln 2}{k}$$

$$2. xy' + y = 0, y(4) = 6$$

$$y' = \frac{-y}{x}$$

$$\frac{dy}{dx} = \frac{-y}{x}$$

$$\int \frac{1}{y} dy = \int -\frac{1}{x} dx + c$$

$$\ln y = -\ln x + c = \ln \frac{1}{x} + c$$

$$y = \frac{1}{x} e^c$$

$$y(4) = 6 \Rightarrow \frac{1}{4} e^c = 6, e^c = 24$$

$$y = \frac{24}{x}$$