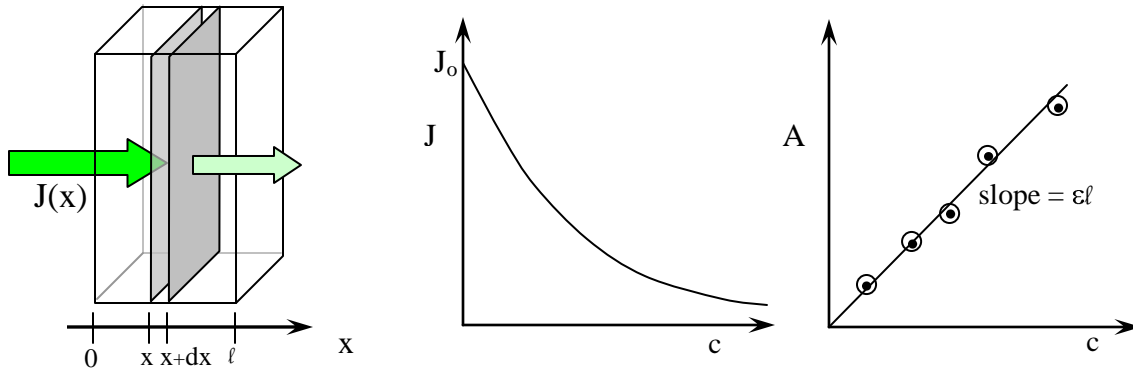


Absorption Spectroscopy



$$dJ = -\beta c J(x) dx$$

β the intrinsic ability of the molecules in the sample to absorb light at the given wavelength
 fraction of the light flux absorbed by the molecules
 probability of absorbing photons

$\int I$ General form of $df = -a f dx$

$$\ln \frac{J}{J_0} = -\beta \ell c$$

Beer-Lambert Law:

$$J = J_0 e^{-\beta \ell c}$$

$$\ln \frac{J_0}{J} = \beta \ell c$$

$$A \equiv \log \frac{J_0}{J}$$

$\ln x = 2.303 \log x$:

$$A = \log \frac{J_0}{J} = \frac{\beta}{2.303} \ell c$$

Define $\epsilon \equiv \beta/2.303$

$$A = \epsilon \ell c$$

$$J = J_0 10^{-\epsilon \ell c}$$

$$T = I/I_0 \quad \text{and} \quad \%T = (I/I_0) 100\%$$

$$A = \log \frac{J_0}{J} = \log \frac{P_0}{P} = \log \frac{I_0}{I} = \log 1/T = \log \frac{100}{\%T}$$