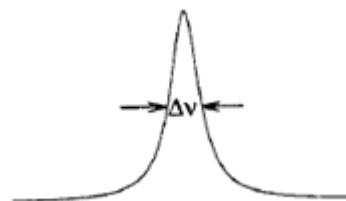## (6) Applications – digression into dynamics: lineshape

- **Slow** exchange:

$$\Delta \nu = \frac{k}{\pi} = \frac{1}{\pi \tau}$$

- **Intermediate** exchange (coalescence):

$$k = \frac{\pi \delta \nu}{\sqrt{2}} \approx 2.2 \delta \nu$$

Eyring's equation: $\Delta G^{\neq} = 19.13 T_c (9.97 + \log \frac{T_c}{\delta \nu})$ $[\text{Jmol}^{-1}]$

- **Fast** exchange:

$$\Delta \nu = \frac{\pi (\delta \nu)^2}{2k} = \frac{1}{2} \pi (\delta \nu)^2 \tau$$