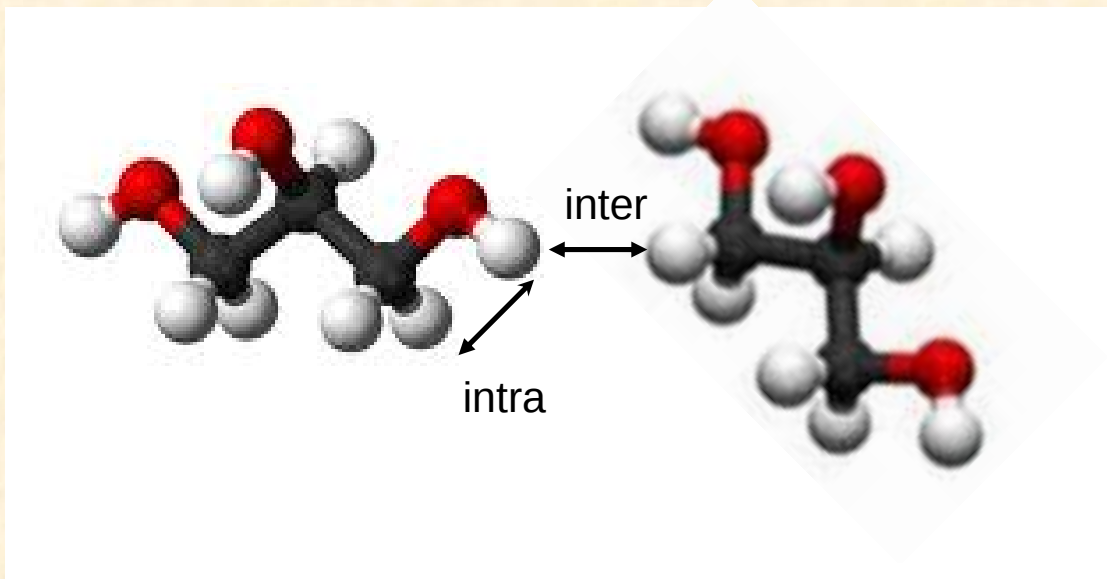


Intra- and inter-molecular interactions



$$R_1^{HH} = R_{1,\text{int } ra}^{HH} + R_{1,\text{int } er}^{HH}$$

$$R_{1,\text{int } ra}^{HH}(\omega_H) = \frac{2}{5} I_H (I_H + 1) (C_{\text{int } ra}^{HH})^2 [J_{\text{int } ra}(\omega_H) + 4J_{\text{int } ra}(2\omega_H)]$$

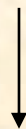


spectral density

$$J_{\text{int } ra}(\omega) = \frac{\sin[\beta \arctan(\omega \tau_R)]}{\omega [1 + (\omega \tau_R)^2]^{\frac{\beta}{2}}}$$

Intra- and inter-molecular interactions

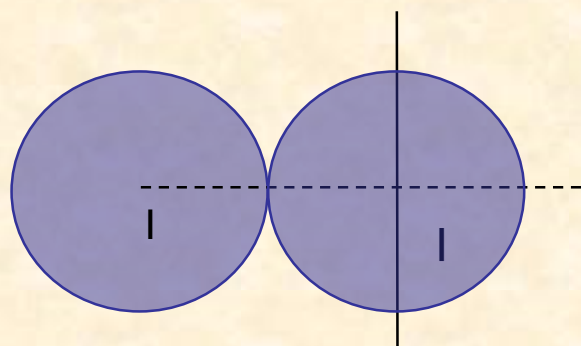
$$R_1^{HH} = R_{1,\text{int } ra}^{HH} + R_{1,\text{int } er}^{HH}$$



$$R_{1,\text{int } er}^{HH}(\omega_H) = \frac{2}{5} I_H (I_H + 1) N_H \frac{4\pi}{3} \frac{1}{d^3} (C_{\text{int } er}^{HH})^2 [J_{\text{int } er}(\omega_H) + 4J_{\text{int } er}(2\omega_H)]$$



$$J_{\text{int } er}(\omega) = 72 \frac{3}{4\pi} \int_0^\infty \frac{u^2}{81 + 9u^2 - 2u^4 + u^6} \frac{u^2 \tau_{\text{trans}}}{u^4 + (\omega \tau_{\text{trans}})^2} du$$



$$d = 2r$$

$$\tau_{\text{trans}} = \frac{d^2}{D_{\text{trans}}}$$

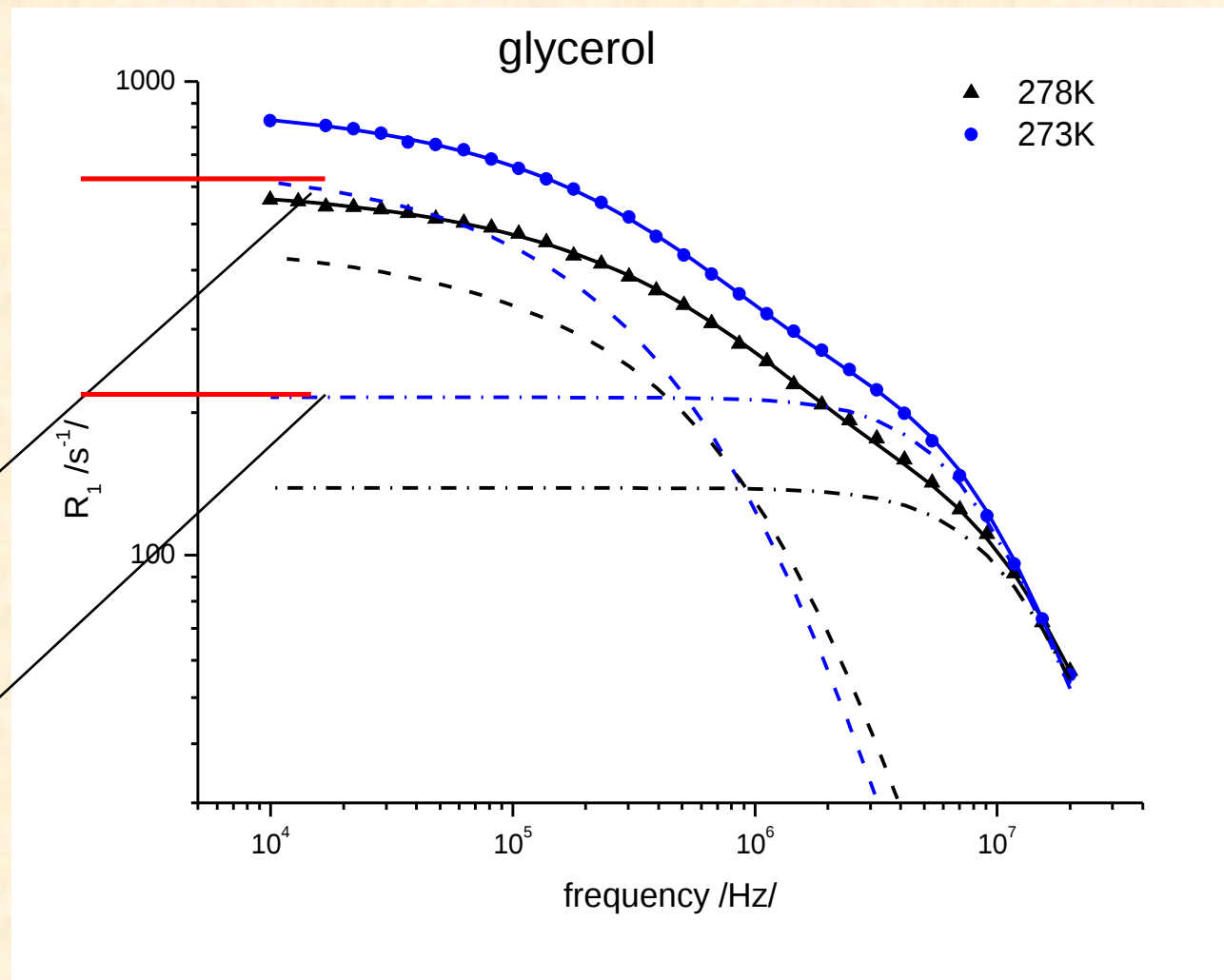
Stokes-Einstein equation

$$\tau_{\text{trans}} / \tau_R = 9$$

$$\frac{R_{1,inter}}{R_{1,intra}} \cong 2N_H \frac{r^6}{dD_{trans}\tau_R}$$

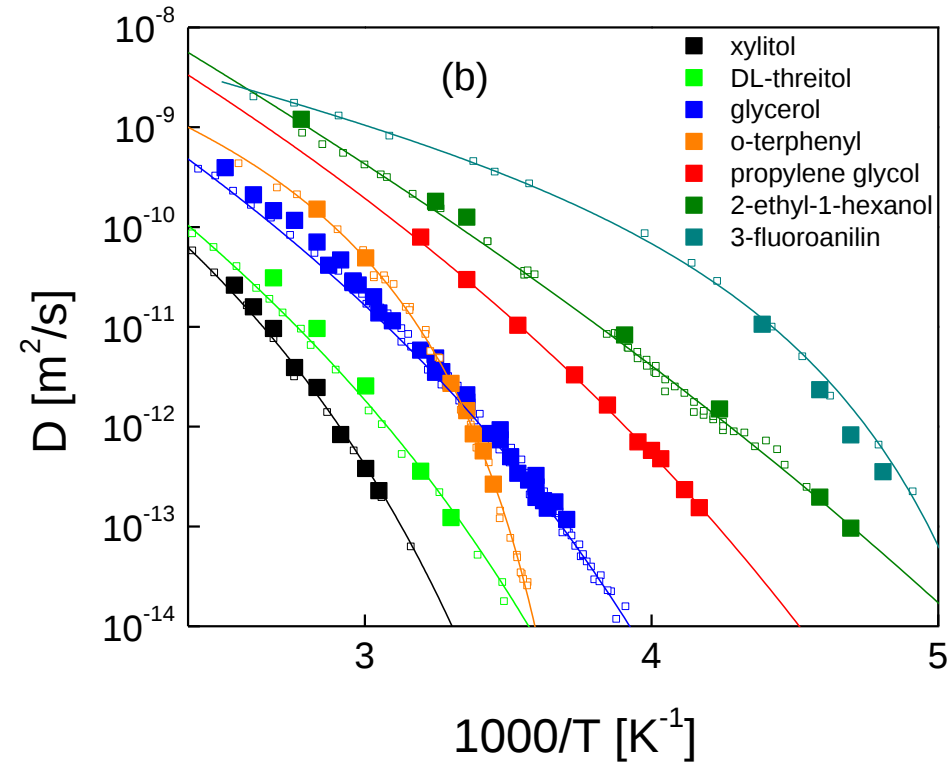
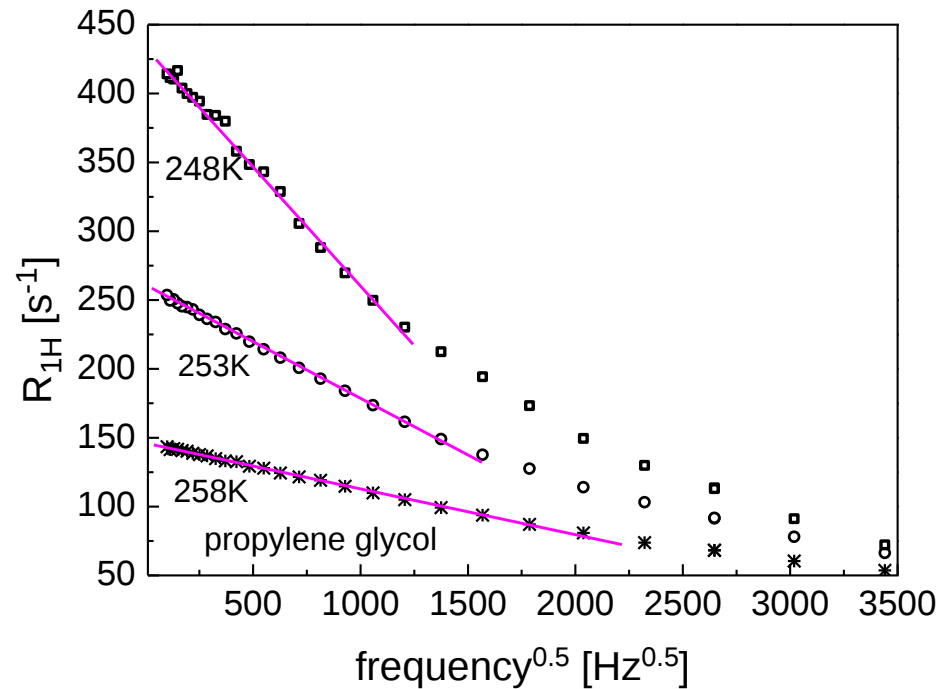
Inter-molecular

Intra-molecular



Translation diffusion

Diffusion coefficient D
as obtained from FC ^1H NMR (full symbols)
and field-gradient NMR (open symbols)



$$R_1(\nu) \cong R_1(0) - B\sqrt{\nu} = R_1(0) - N \left(\frac{\mu_0}{4\pi} \gamma_H^2 \hbar \right)^2 \left(\frac{\sqrt{2} + 8}{30} \right) \left(\frac{\pi}{D} \right)^{3/2} \sqrt{\nu}$$