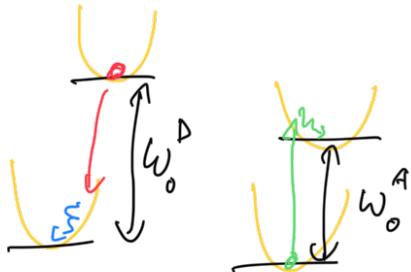


Detailne rovornostia ve Försterove teorii

Försterova teorie



$$\Delta\omega = \omega_0^D - \omega_0^A$$

Termodynamická
rovnostia mezi
energiemi

$$\frac{\gamma(\omega_0^D - \lambda_D)}{2} \quad \frac{\gamma(\omega_0^A + \lambda_A)}{2}$$

Rovnorovnost svedca ma' tvar

$$K_{AD} = \alpha e \int \chi_A(\omega) f_D(\omega) \quad D \rightarrow A$$

$$K_{DA} = \alpha \int \chi_D(\omega) f_A(\omega) \quad A \rightarrow D$$

mile by plati

$$\frac{K_{DA}}{K_{AD}} = \ell \frac{\gamma(\omega_0^D - \omega_0^A)}{\epsilon_B T}$$

Využitie F. teorie je dnu m'ky neúčinné!

$$\begin{aligned}
 K_{AD} &= \frac{(\gamma_{AD})^2}{\gamma^2} 2\pi \int_0^\infty dt e^{-\gamma_D t} \left\{ U_0^+(t) U_A(t) \omega_{eq}^D \right\} \\
 &= \frac{(\gamma_{AD})^2}{\gamma^2} \int_{-\infty}^\infty dt e^{-\gamma_D |t|} \left\{ U_0^+(t) U_A(t) \omega_{eq}^D \right\}
 \end{aligned}$$

$$\text{tr}_B \{ \dots \} = \sum_v \langle v | U_D^T(f) | v \rangle \langle v | U_A(f) | v \rangle P(v)$$

↑ diagonal in
v/v ↑ mag for the 'diagonal'
v/v

$U_A(f)$ non 'diagonal' in $|v\rangle$

$$\langle v | U_A(f) | v \rangle = \sum_{\text{gu}} \langle v | e_i^r \rangle \underbrace{\langle u |}_{\text{de}^r} \underbrace{| U_A(f) |}_{\text{diagonal in f's}} \langle e^r | v \rangle$$

$$\langle v | U_A(f) | v \rangle = \sum_{\text{gu}} |Kv| e^r|^2 U_{gu}^A(f)$$

$$\begin{aligned} \text{tr}_B \{ \dots \} &= \sum_{\text{gu}} e^{\frac{i}{\hbar} \epsilon_D^r t - \frac{i}{\hbar} \epsilon_{gu}^A t} |Kv| e^r|^2 P_D(v) \\ &= \sum_{\text{gu}} e^{i \omega_{gu}^{DA} t} |Kv| e^r|^2 P_D(v) \end{aligned}$$

$$\boxed{K_{AD} \approx \int_{-\infty}^{\infty} dt \sum_{\text{gu}} e^{i \omega_{gu}^{DA} t} |Kv| e^r|^2 P_D(v)}$$

$\approx \sum_{\text{gu}} \delta(\omega_{gu}^{DA}) |Kv| e^r|^2 P_D(v)$

$$\boxed{K_{DA} \approx \int_{-\infty}^{\infty} dt \sum_{\text{gu}} \delta(\omega_{gu}^{AD}) |Kv| e^r|^2 P_A(v)}$$

$$\hbar \omega_{gu}^{AD} = \hbar \omega_0^{AD} + \hbar \omega_r^A - \hbar \omega_u^D = 0$$

$$\hbar \omega_{gu}^{DA} = \hbar \omega_0^{DA} + \hbar \omega_v^D - \hbar \omega_u^A = 0$$

$$\begin{aligned}
 K_{DA} &\propto \sum_{\gamma u'} \delta(\omega_0^{AD} + \omega_v^A - \omega_{u'}^D) |Kv|_{u'}|^2 \ell \frac{\frac{\gamma \omega_0^{AD}}{\epsilon_0 T} - \frac{\gamma \omega_{u'}^D}{\epsilon_0 T}}{\epsilon_0 T} \\
 &= \sum_{\gamma u'} \delta(\omega_0^{AD} + \omega_v^A - \omega_{u'}^D) |Kv|_{u'}|^2 P_D(u') \ell \frac{\frac{\gamma \omega_0^{AD}}{\epsilon_0 T}}{\epsilon_0 T} \\
 K_{AD} &\approx \sum_{\gamma u'} \delta(\omega_0^{DA} + \omega_v^D - \omega_{u'}^A) |Kv|_{u'}|^2 P_D(v) \quad \begin{matrix} u' \rightarrow v \\ v \rightarrow u' \end{matrix} \\
 &= \sum_{\gamma u'} \delta(\omega_0^{DA} + \omega_{u'}^D - \omega_v^A) |Kv|_{u'}|^2 P_D(u') \quad \delta(\omega) \rightarrow \delta(-\omega) \\
 &= \sum_{\gamma u'} \delta(\omega_0^{DA} + \omega_v^A - \omega_{u'}^D) |Kv|_{u'}|^2 P_D(u')
 \end{aligned}$$

$$K_{DA} = K_{AD} \ell \frac{\frac{\gamma \omega_0^{AD}}{\epsilon_0 T}}{\epsilon_0 T}$$

$$\boxed{\frac{K_{DA}}{K_{AD}} = \ell \frac{-\frac{\gamma \omega_0^{DA}}{\epsilon_0 T}}{\frac{\gamma \omega_0^{AD}}{\epsilon_0 T}}}$$