

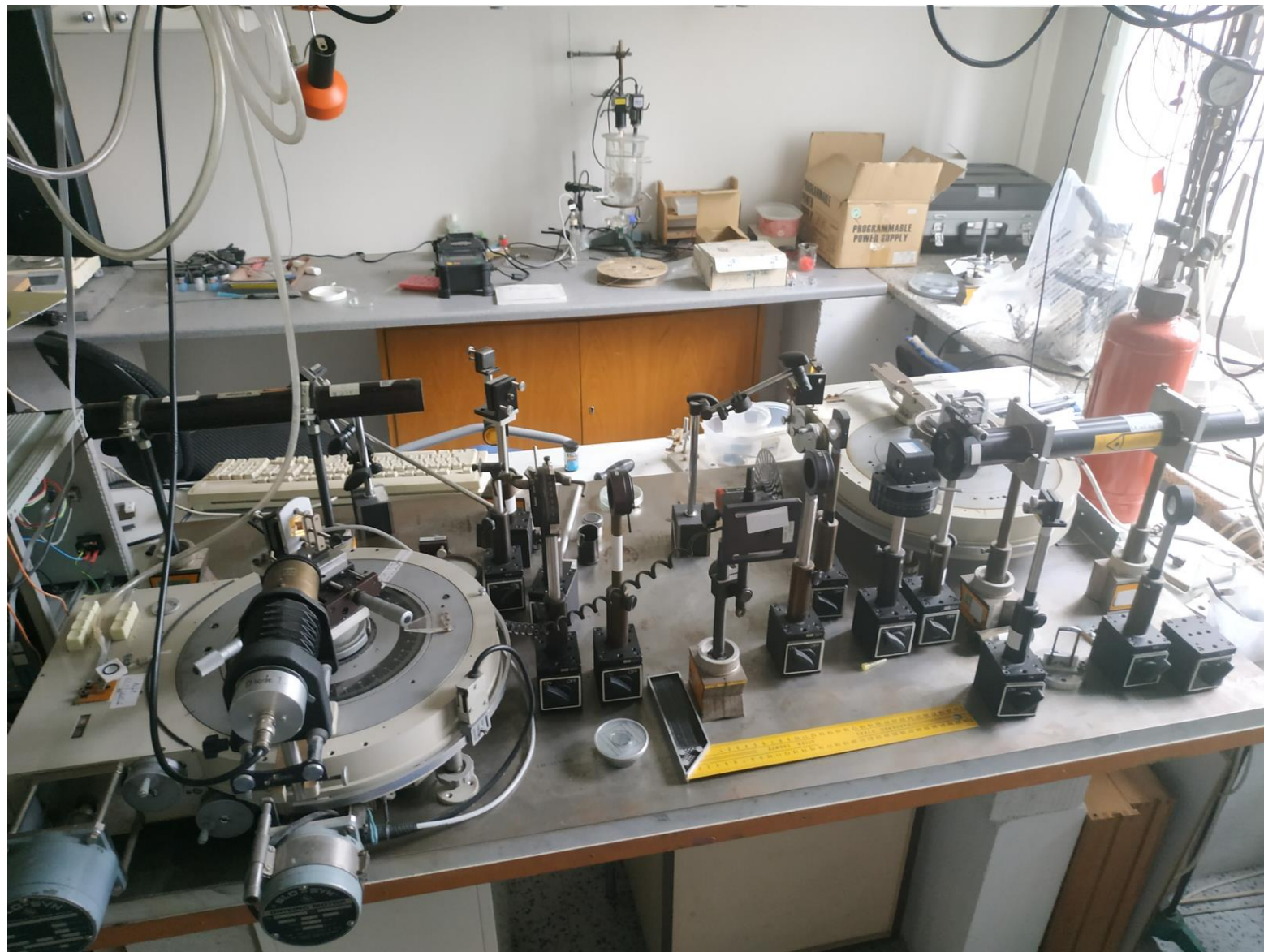
Proč je zlato lesklé?

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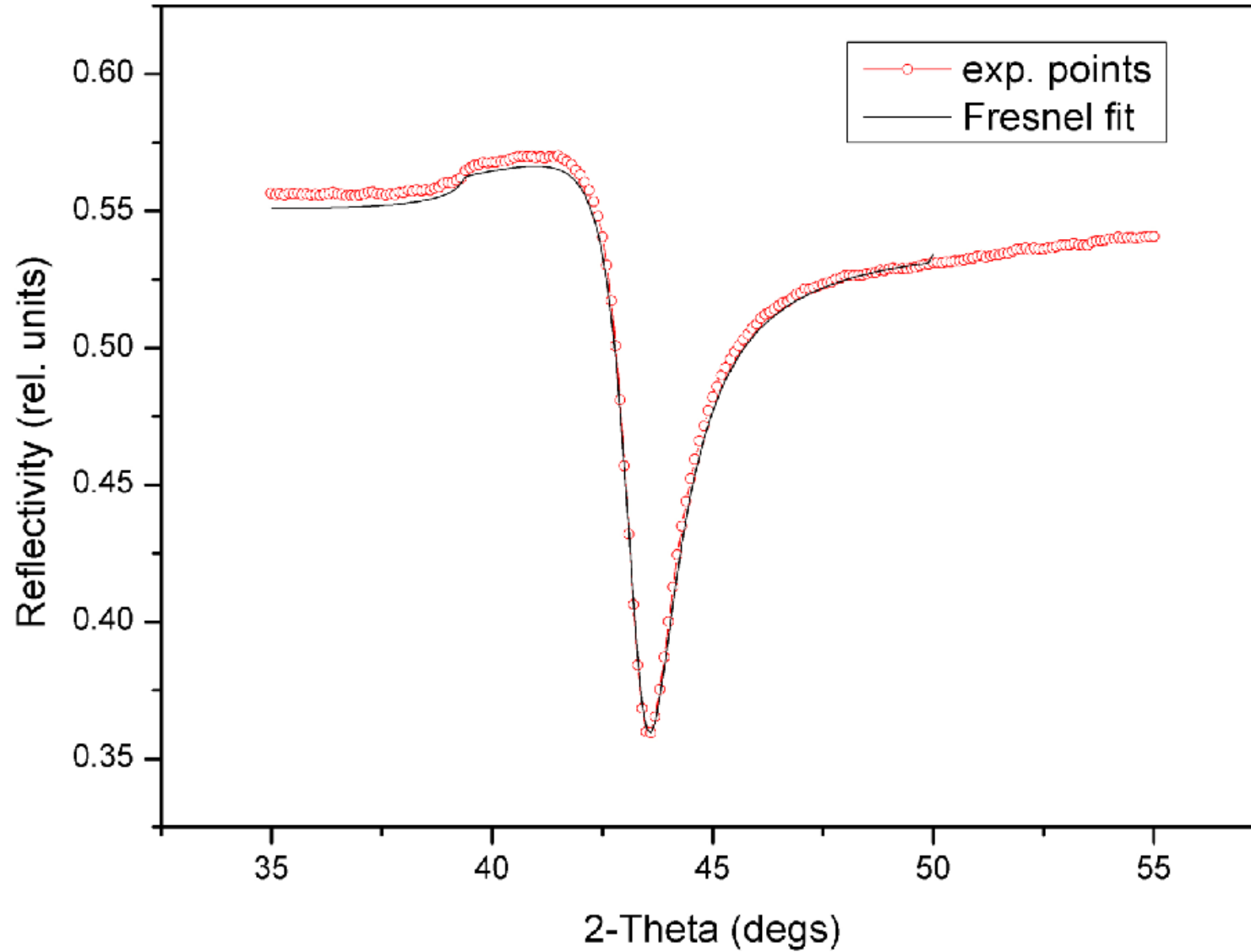
PVD – fyzikální depozice z plynné fáze



Sestava ATR



Graf reflektivity na úhlu



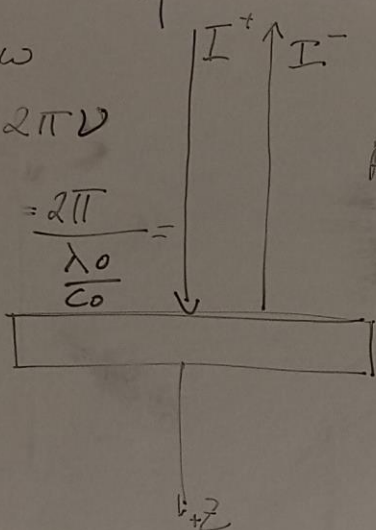
Teoretické výpočty

$$\nu = \frac{1}{T}$$

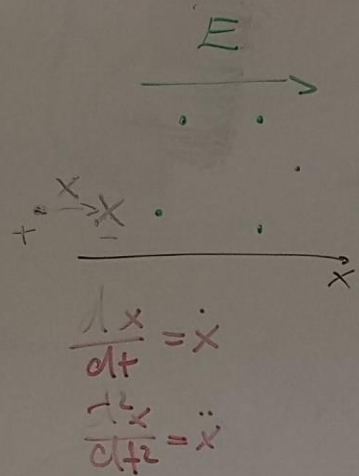
$$E = h\nu$$

$$\omega = 2\pi\nu$$

$$= \frac{2\pi}{T}$$

$$= \frac{2\pi}{\frac{\lambda_0}{c_0}} = \frac{2\pi c_0}{\lambda_0}$$


$$R = \frac{I^-}{I^+}$$



$$\bar{P} = Ne\bar{x}$$

$$m_e \ddot{x} = -\frac{e^2 N x}{\epsilon_0}$$

$$\ddot{x} + \underbrace{\frac{e^2 N}{\epsilon_0 m_e}}_{\omega_p^2} x = 0$$

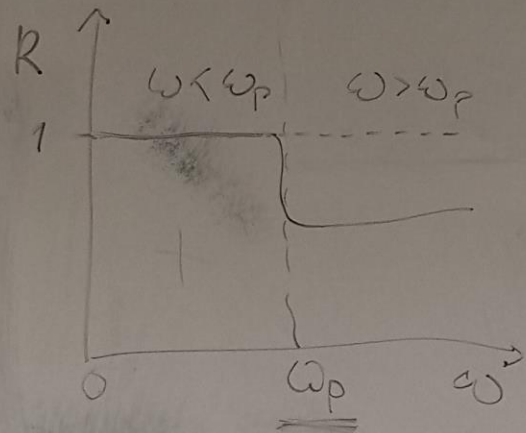
$$F = eE = -e \frac{P}{\epsilon} = -\frac{e^2 N x}{\epsilon}$$

$$x^c = A e^{i\omega t} = A (\cos \omega t - i \sin \omega t)$$

$$x = \text{Re}\{x^c\} = A \cos \omega t$$

$$\frac{dx^c}{dt} = A i \omega e^{i\omega t}$$

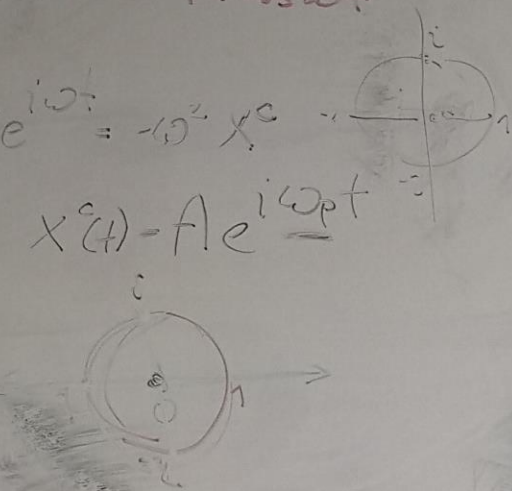
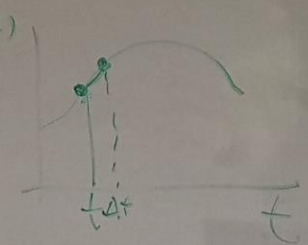
$$\frac{d^2x^c}{dt^2} = A (-1) \omega^2 e^{i\omega t} = -\omega^2 x^c$$



$$\frac{d^2 f(t)}{dt^2} = \lim_{\Delta t \rightarrow 0} \frac{f(t+\Delta t) - f(t)}{\Delta t} = -\omega^2 x^c + \omega_p^2 x^c = 0$$

$$x^c (\omega_p^2 - \omega^2) = 0$$

$$\omega^2 = \omega_p^2$$



Teoretické výpočty 2

ATR

$R = \frac{I_1}{I_0}$
 λ_0
 $\vec{E}(t, \vec{r}) = \vec{E}_0 e^{-i(\omega t + \vec{k} \cdot \vec{r})}$

sklo: $n = 1.512$ $n^2 = \epsilon$

$k_{||} = n \cdot \sin \theta_R$

TEM

$\epsilon_{sklo} \approx 2.3$

$\epsilon = 1$

SPR

$f(\omega) = \frac{1}{2\pi} \int F(\vec{k}) d\vec{k}$

$\epsilon(\omega) = 1 - \frac{\omega_p^2}{\omega^2} \rightarrow \omega_p$

Děkujeme za pozornost