

A Practical Guide To Optical Metrology For Thin Films

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ERRATA

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Eqs. (2.85) and (2.86) must be

$$\varepsilon_1 = n^2 - \kappa^2 \quad (2.85)$$

$$\varepsilon_2 = 2 \cdot n \cdot \kappa \quad (2.86)$$

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With this *Tauc-Lorentz model* the imaginary part of the complex dielectric function of amorphous materials with band gap (mainly semiconductor materials) can be modeled as

$$\varepsilon_{2TL}(\omega) = \begin{cases} \frac{S \omega_{\text{res}}^2 \cdot \gamma \cdot (\omega - \omega_{\text{gap}})^2}{\omega \left(\omega^2 - \omega_{\text{res}}^2 \right)^2 + \omega^2 \gamma^2} & \omega > \omega_{\text{gap}} \\ 0 & \omega \leq \omega_{\text{gap}} \end{cases} \quad (2.106)$$

The oscillator has a resonance frequency ω_{res} , a damping constant γ and an oscillator strength S . ω_{gap} is the frequency corresponding to the band gap energy $E_{\text{gap}} = \hbar\omega_{\text{gap}}$. Note that in the original paper, the formula is expressed in terms of photon energies. Moreover, the square of ω_{res} is missing there.