

Graph referenced as "Light scattering. Zimm plot for cellulose nitrate in acetone (Bernoit, Holtzer + Doty)"

Contributors

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on graph paper.

An example of such a plot is shown in Fig. 18-3. From it we obtain, as seen, the two types of limiting plot. Extrapolating to $\theta = 0^\circ$, we obtain a plot of $\mathcal{K}c/R_\theta$ versus kc , which, by equation 17-30, gives $1/M$ as intercept

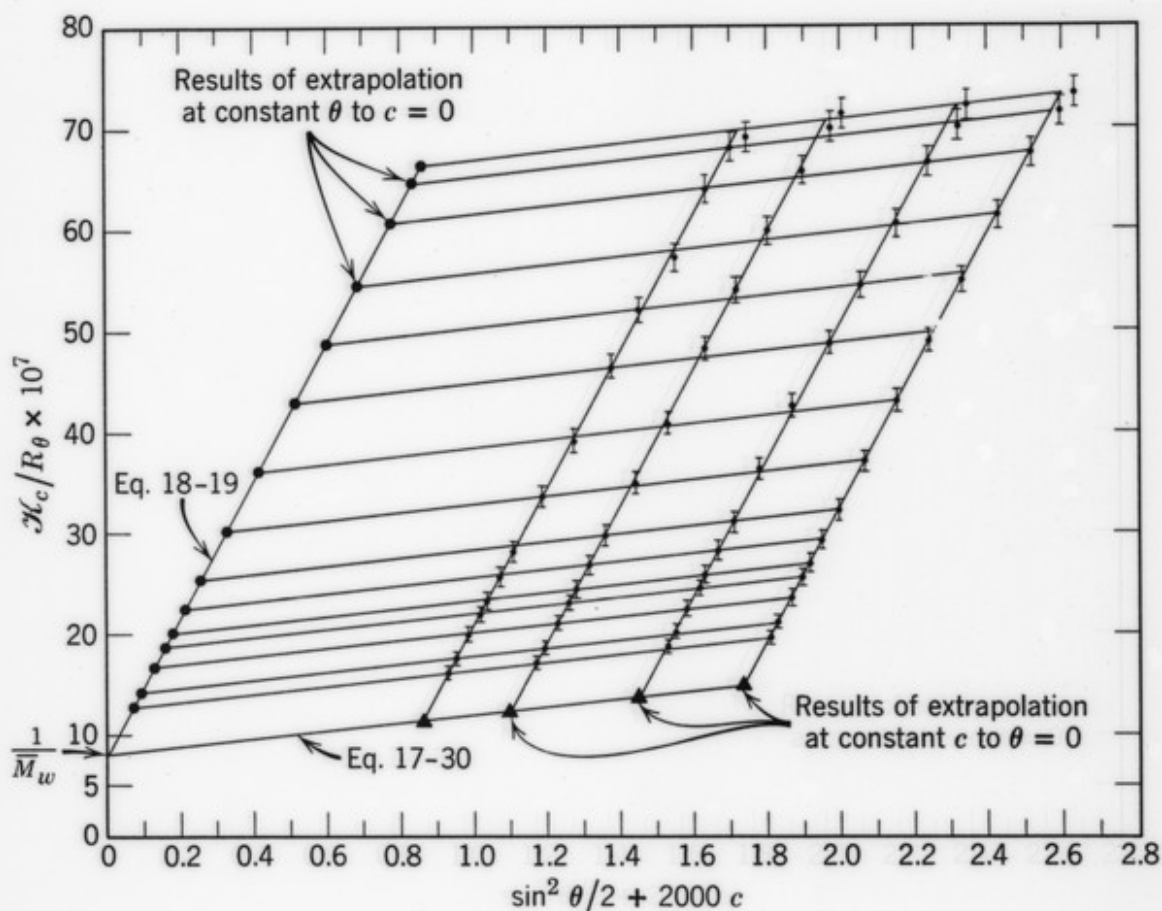


Fig. 18-3. Zimm plot for extrapolation of light scattering data. The data are for a cellulose nitrate fraction in acetone (Benoit, Holtzer, and Doty.⁴⁷)

and $2B/k$ as limiting slope. Extrapolating to $c = 0$, we obtain a plot of $\mathcal{K}c/R_\theta$ versus $\sin^2(\theta/2)$. Since R_θ is directly proportional to i_θ (equation 17-27), we get, by combining equations 17-30, 18-1, and 18-18,

$$\lim_{c \rightarrow 0} \frac{\mathcal{K}c}{R_\theta} = \frac{1}{M P(\theta)} = \frac{1}{M} \left(1 + \frac{16\pi^2}{3\lambda^2} R_G^2 \sin^2 \frac{\theta}{2} + \dots \right) \quad (18-19)$$