結晶化度

結晶化度の解析法

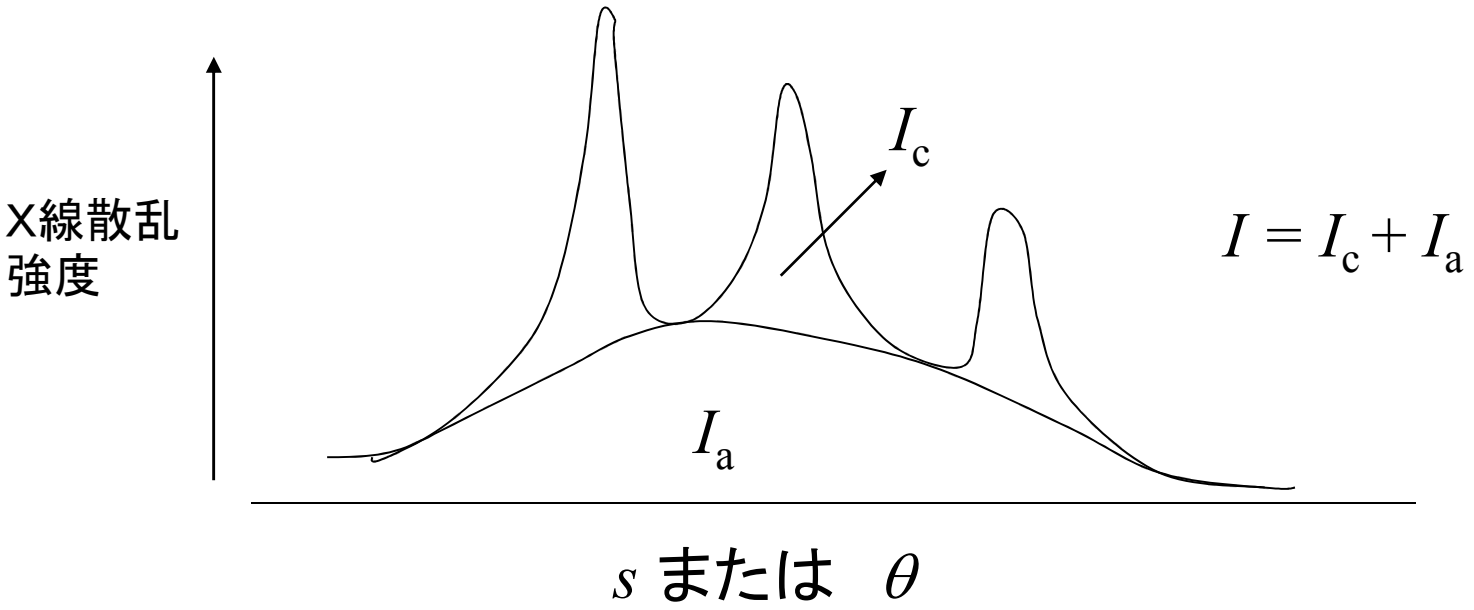
X線散乱

$$X_c = \frac{\int_0^\infty s^2 I_c(s) ds}{\int_0^\infty s^2 I(s) ds}$$

基本原理
（周期構造からの散乱強度／全散乱強度）

$$X_c = \frac{\int_{2\theta_1}^{2\theta_2} I_c(2\theta) d(2\theta)}{\int_{2\theta_1}^{2\theta_2} I(2\theta) d(2\theta)}$$

簡便法



その他の結晶化度測定法

密度法

$$X_c^{\,V} = \frac{\rho - \rho_a}{\rho_c - \rho_a}$$

体積分率結晶化度

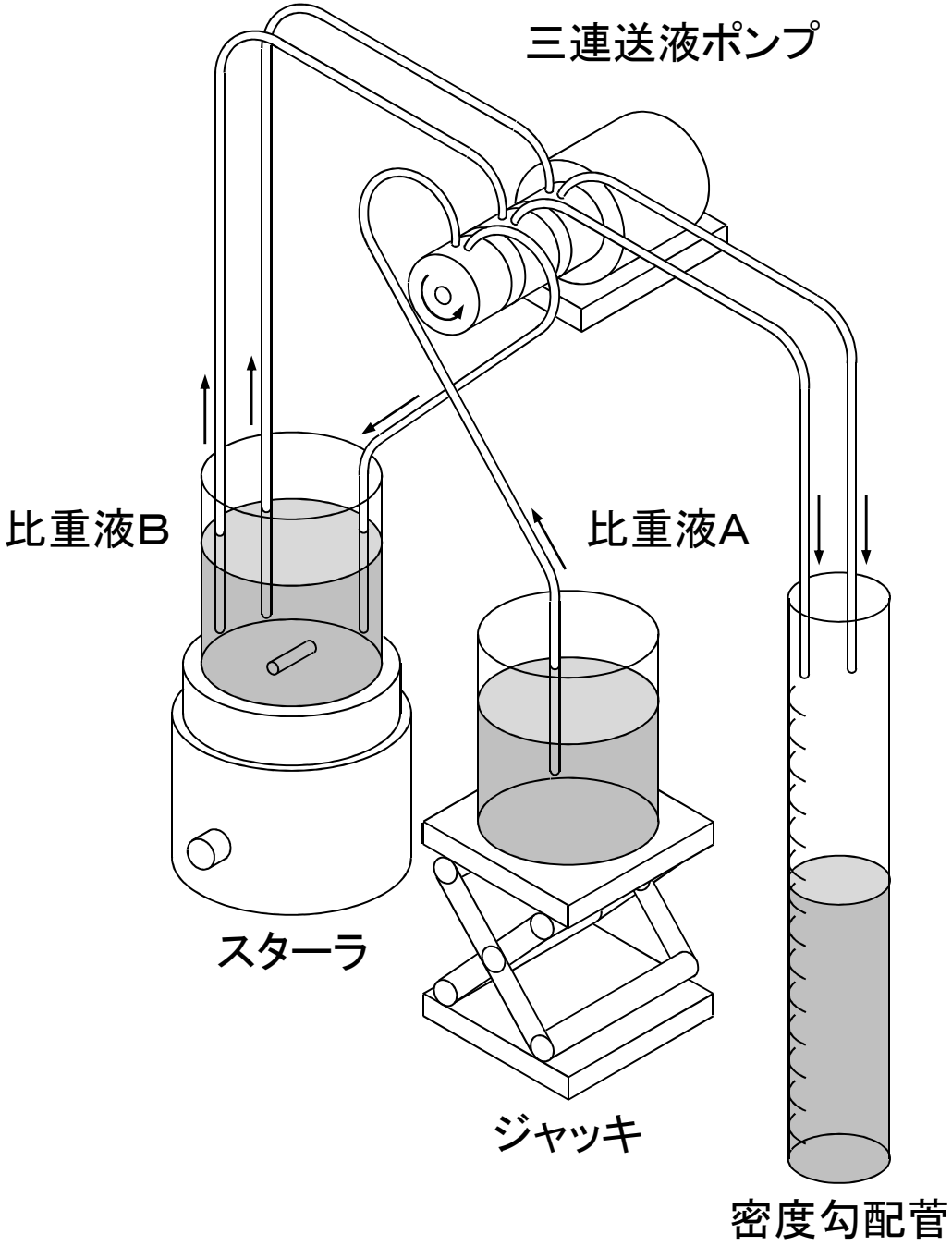
$$X_c = \frac{\rho_c}{\rho}\frac{(\rho - \rho_a)}{(\rho_c - \rho_a)}$$

質量分率結晶化度

$$X_c = \frac{\Delta H_e}{\Delta H_m^0}$$

熱量法（DSC測定）

密度勾配管の作製法



Analysis of crystallinity

X-ray scattering

Principle:

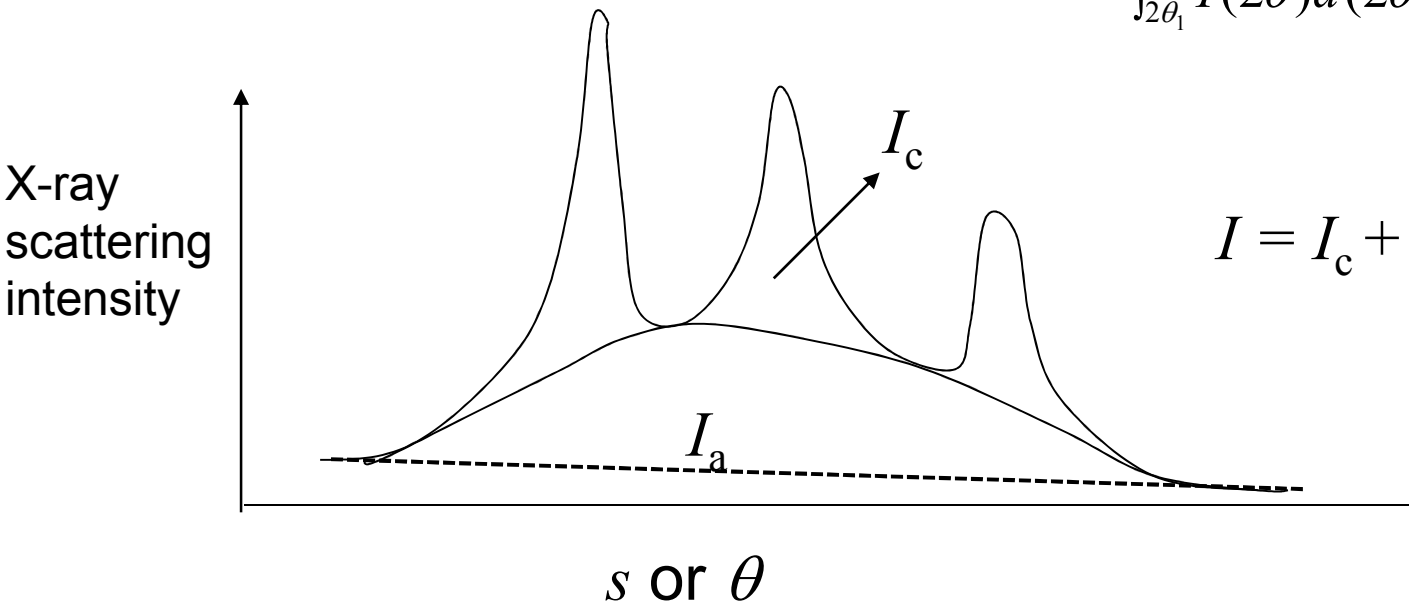
Crystallinity =

$$\frac{\text{scattering intensity from periodic structure}}{\text{total scattering intensity}}$$

$$X_c = \frac{\int_0^\infty s^2 I_c(s)ds}{\int_0^\infty s^2 I(s)ds}$$

Simplified method

$$X_c = \frac{\int_{2\theta_1}^{2\theta_2} I_c(2\theta)d(2\theta)}{\int_{2\theta_1}^{2\theta_2} I(2\theta)d(2\theta)}$$



$$I = I_c + I_a$$

Other methods for analysis of crystallinity

Density measurement

Volume fraction crystallinity

$$X_c^{\,V} = \frac{\rho - \rho_a}{\rho_c - \rho_a}$$

Mass fraction crystallinity

$$X_c = \frac{\rho_c}{\rho}\,\frac{(\rho - \rho_a)}{(\rho_c - \rho_a)}$$

Thermal analysis

DSC (differential scanning calorimetry)

$$X_c = \frac{\Delta H_e}{\Delta H_m^0}$$