Review

Application for Bragg Scattering, Thin Films, and CD's

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$\lambda = 650nm$
$k = 2$
$d = 1.15\times10^-3cm$

$$\begin{aligned}\sin\theta &= \frac{k\lambda}{d} \\ &= \frac{2(650nm)}{1.15\times10^{-3}cm} \\ &= 6.49^\circ\end{aligned} \tag{1}$$

$d = \frac{1}{2500}cm = 4.00\times10^{-6}m$
$k = 3$
$\theta = 12^\circ$

$$\begin{aligned}\sin\theta &= \frac{k\lambda}{d} \\ \sin 22^\circ &= \frac{1(650nm)}{d} \\ d &= 3.13\times10^{-6}m \\ \sin\theta &= \frac{4(650nm)}{3.13\times10^{-6}m} \\ \sin\theta &= 0.831 \\ \theta &= 56^\circ\end{aligned} \tag{2}$$

$d = \frac{1}{10000} cm = 1.0 \times 10^{-6} m$
$k = 1$
$\theta_1 = 31.2^\circ$
$\theta_2 = 36.4^\circ$
$\theta_3 = 47.5^\circ$

$$\begin{aligned} \sin\theta_1 &= \frac{k\lambda_1}{d} \\ \sin 31.2^\circ &= \frac{1\lambda_1}{1.0 \times 10^{-6} m} \\ \lambda_1 &= \sin 31.2^\circ \times 1.0 \times 10^{-6} m \\ \lambda_1 &= 518 nm \end{aligned} \tag{3}$$

$d = \frac{1}{10000} cm$