

56. (a) For the first beam $2d \sin \theta_1 = \lambda_A$ and for the second one $2d \sin \theta_2 = 3\lambda_B$. The values of d and λ_A can then be determined:

$$d = \frac{3\lambda_B}{2 \sin \theta_2} = \frac{3(97 \text{ pm})}{2 \sin 60^\circ} = 1.7 \times 10^2 \text{ pm} .$$

(b)

$$\lambda_A = 2d \sin \theta_1 = 2(1.7 \times 10^2 \text{ pm})(\sin 23^\circ) = 1.3 \times 10^2 \text{ pm} .$$