

54. We use Eq. 37-31. From the peak on the left at angle 0.75° (estimated from Fig. 37-38), we have

$$\lambda_1 = 2d \sin \theta_1 = 2(0.94 \text{ nm}) \sin(0.75^\circ) = 0.025 \text{ nm} = 25 \text{ pm} .$$

This estimation should be viewed as reliable to within $\pm 2 \text{ pm}$. We now consider the next peak:

$$\lambda_2 = 2d \sin \theta_2 = 2(0.94 \text{ nm}) \sin 1.15^\circ = 0.038 \text{ nm} = 38 \text{ pm} .$$

One can check that the third peak from the left is the second-order one for λ_1 .