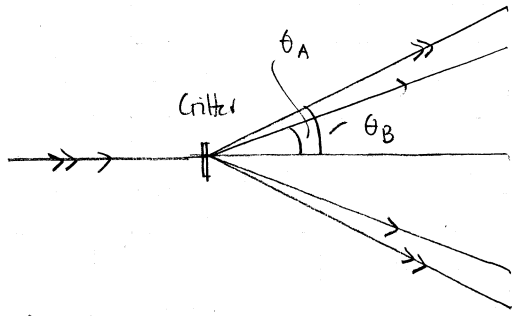
B2002-10



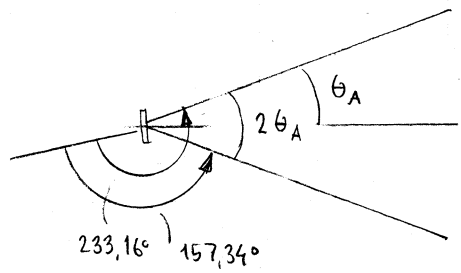

Gitterkonstanten

$$d = \frac{1 \cdot 10^{-3}\ \text{m}}{520} = 1{,}92 \cdot 10^{-6}\ \text{m}$$

Avböjningsvinklarna:

$$\theta_A = \frac{233{,}16^\circ - 157{,}34^\circ}{2} = 37{,}91^\circ$$

$$\theta_B = \frac{233{,}16^\circ - 157{,}39^\circ}{2} = 37{,}86^\circ$$




Gitterekvationen (med $n = 2$) ger nu de sökta våglängderna:

$$d \sin\theta = n\lambda \quad \Rightarrow \quad \lambda_A = \frac{d \sin\theta_A}{2} = \frac{1{,}92 \cdot 10^{-6}\ \text{m} \cdot \sin 37{,}91^\circ}{2}$$

$$= 591 \cdot 10^{-9}\ \text{m}$$

$$\lambda_B = \frac{d \sin\theta_B}{2} = \frac{1{,}92 \cdot 10^{-6}\ \text{m} \cdot \sin 37{,}86^\circ}{2}$$

$$= 590 \cdot 10^{-9}\ \text{m}$$

Svar: Gitterkonstanten 1,92 µm, våglängderna 590nm och 591nm