

Atomvibrationen in einem Metall

a)

b)

c)

Zwei-atomige Kette

a)

b)

c)

Eigenschaften eines Natriumkristalls

$$m = 22.9897 \text{ u}; \quad \rho = 0.968 \text{ g/cm}^3$$

a)

$$a^3 = \frac{9m}{\rho} = \underline{\underline{7.08 \times 10^{-10} \text{ m}}}$$

b) $I \propto |F_{\text{hkl}}|^2$

$$|F_{111}|^2 = f^2 \left(\left| e^0 + e^{3i\pi} \right|^2 \right) = 0$$

$$|F_{110}|^2 = f^2 \left(\left| e^0 + e^{2i\pi} \right|^2 \right) = 2f^2$$

The Intensity for a (111) Lattice is lower than for a (110) lattice.

c) $T_D = 150 \text{ K}$

$$\Omega_D = \frac{T_D k_B}{\hbar} = \underline{\underline{1.96 \times 10^{13} \text{ Hz}}}$$