1. Problem 2.1 in Kittel (Interplanar separation)

2. Analyzing spectral data

In a diffraction measurement using incoming radiation with wavelength \( \lambda = 1.5417 \, \text{Å} \), the following set of Bragg angles (the scattering angle is twice the Bragg angle, as a matter of definition of the latter) was observed:

19.48°, 22.64°, 33.00°, 39.68°, 41.83°, 50.35°, 57.05°, 59.42°

Aluminum has atomic weight 27 g and density 2.7 g/cm\(^{-3}\). Determine the type of lattice (assuming it is of the cubic type: sc, bcc or fcc) and calculate the Avogadro number using this information.

**Hint.** The smallest reciprocal vector IS observed.

3. Problem 2.2 in Kittel (Hexagonal space lattice)

4. Problem 2.7 in Kittel (Diatomic line)