

2024W710201 VU Festkörper-Eigenschaften

Exercise sheet 1

1. Bravais lattices

Why are the following structures not Bravais lattices?

- a) Edge-centered cube
- b) Basis-centered tetragonal
- c) Face-centered tetragonal

2. Reciprocal lattices

Show that the reciprocal lattice of a fcc lattice a bcc lattice is and viceversa.

3. Lattice of hard spheres

Consider hard spheres with radius r .

- a) What is the densest packing of those spheres in two dimensions?
- b) How can one stack those layers to build a three dimensional solid? Is there only one way to stack them or more?
- c) What is the percentage of volume filling?