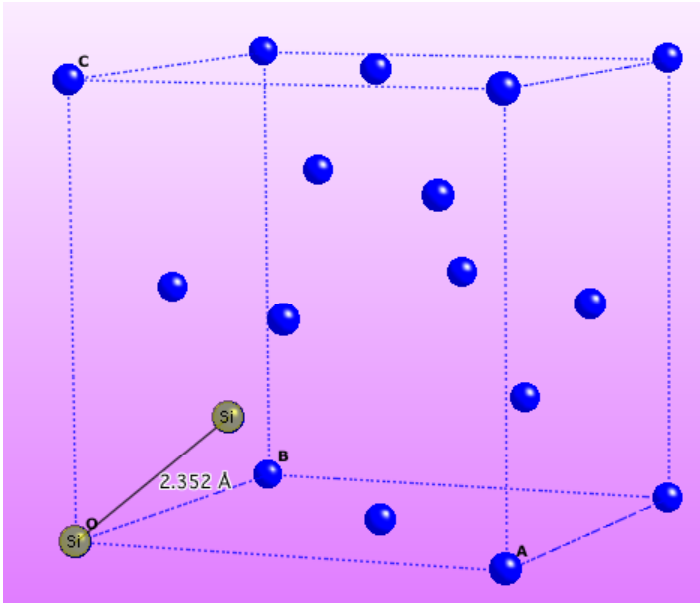


FYS4310 Solutions

PROBLEM 1

- a) Assume a Si single-crystal. Calculate the value of the smallest distance between Si atoms.



Lattice constant Si = 0.35658 nm = a

Smallest distance is along $\langle 111 \rangle$.

For example there is an atom at the position $xyz=(0,0,0)$ and at $(0.25,0.25,0.25)= a/4*(1,1,1)$

So distance is $\sqrt{3}/4 * a = 0.2352$ nm

- b) Assume a diamond single crystal. Calculate the smallest distance between C atoms.

Lattice constant diamond is 0.35668 nm

The distance is $\sqrt{3}/4 * a = 0.15445$ nm