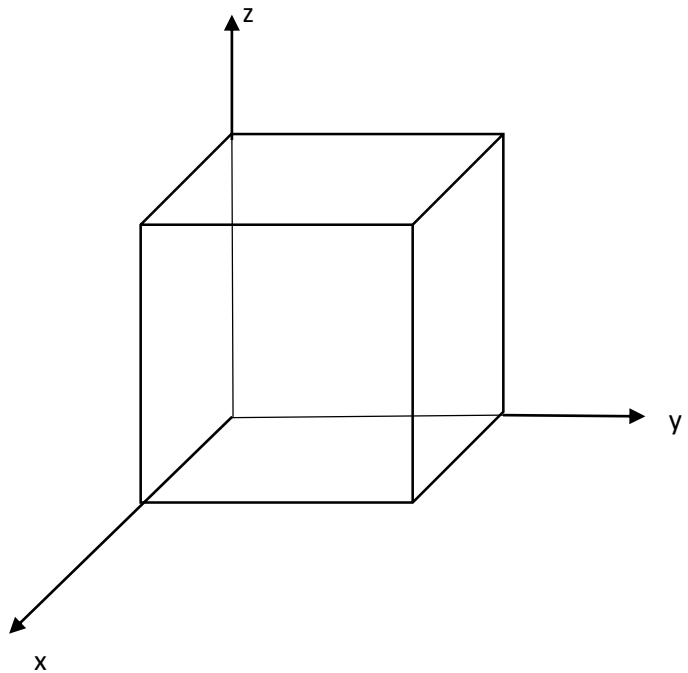
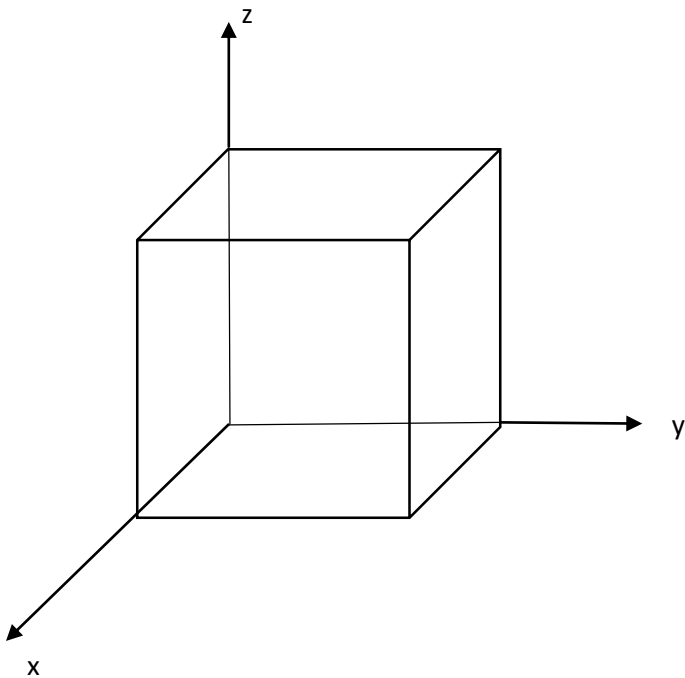


THE STRUCTURE OF CRYSTALLINE SOLIDS

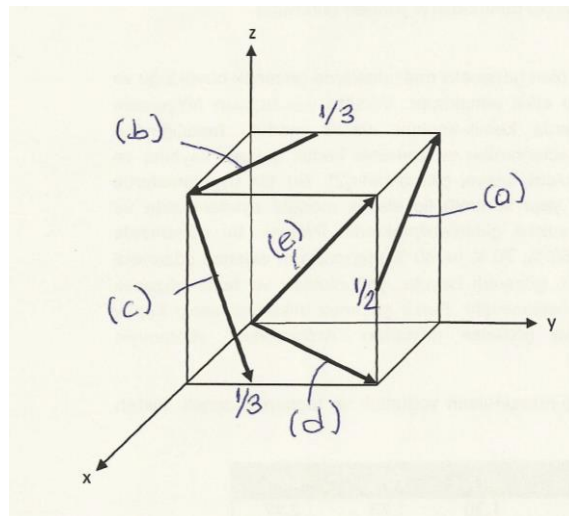
- 1) Calculate the radius of chromium atom, given that Cr has an BCC crystal structure, a density of 7.19 g/cm^3 , and an atomic weight of 52 g/mol .
- 2) Below are listed the atomic weight, density, and atomic radius for two hypothetical alloys. For each determine whether its crystal structure is FCC, BCC or simple cubic and then justify your determination.

Alloy	Atomic Weight (g/mol)	Density (g/cm^3)	Atomic Radius (nm)
X	184.4	12.3	0.146
Y	43.1	6.4	0.122

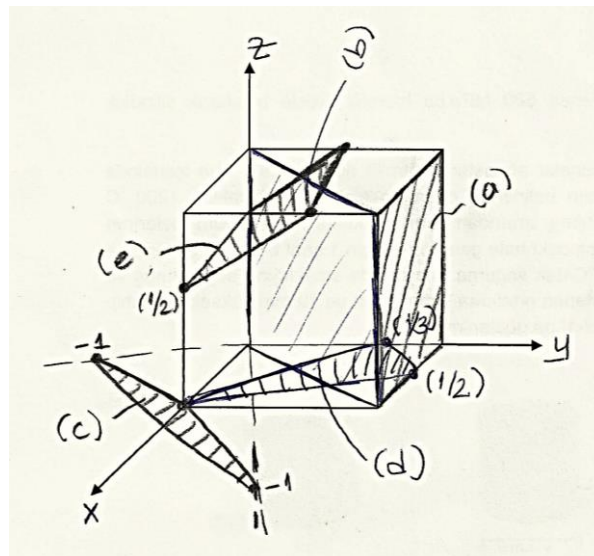
- 3) Within a cubic unit cell, sketch the following directions and planes:
[101], [211], [10 $\bar{2}$], [3 $\bar{1}$ 3], [$\bar{1}$ 1 $\bar{1}$]
(220), (0 $\bar{2}$ 1), (1 $\bar{1}$ $\bar{1}$), ($\bar{2}$ $\bar{3}$ 1), (002)



4) Determine the indices for the directions shown in the following cubic unit cell:



5) Determine the miller-indices for the planes shown in the following unit cell:



6) Compute and compare the linear densities of the $[101]$ direction for BCC and $[011]$ direction for FCC crystal structures.

7) Compute and compare the planar densities of the (100) and (111) planes for FCC and BCC crystal structures.