Homework 4, CHEM 281
Chapter 4.

1. Define the following terms: (a) electron-sea model of bonding; (b) unit cell, (c) alloy.
2. Explain the meanings of the following terms:(a) crystal lattice; (b) coordination number;(c) amalgam.
3. Using a band diagram, explain how magnesium can exhibit metallic behavior when its 3s band is completely full.
4. What are the two types of layer arrangements in metals? Which has the closer packing?
5. What is the difference in layer structure between cubic close-packed and hexagonal close-packed arrangements?
6. Draw the body-centered cubic unit cell and show how the number of atoms per unit cell is derived.
7. Suggest two reasons why zinc and potassium are unlikely to form a solid solution alloy.
8. In a face-centered cubic unit cell, the atoms usually touch across the diagonal of the face. If the atomic radius is r, calculate the length of each side of the unit cell.
9. Chromium forms a body-centered cubic lattice in which the edge length of the unit cell is 288 pm. Calculate (a) the metallic radius of a chromium atom, and (b) the density of chromium metal.
10. Undertake a critical study of the controversy on the use of mercury amalgam in teeth fillings.