

# Announcements

To join clicker to class today  
(Clickers with LCD display  
join automatically):

- Turn on the Clicker (the red LED comes on).
- Push “Join” button followed by “20” followed by the “Send” button (switches to flashing green LED if successful).
- Last exam 1 week from Friday.
- Lab does not meet the last week of the semester.
- Discussion quiz this week will cover everything since last exam through Monday's lecture.
- Next week you will have an analytical reasoning quiz in discussion.

# Review

- For molecular compounds “like dissolves like”.
- Vocabulary:
  - miscible means the liquids are soluble in each other.
  - Immiscible means the liquids do not mix.
- Reading phase diagrams (normal boiling point,  $T_{\text{trip}}$ ,  $T_c$ , phase boundaries)
- Raoult's Law:  $P_{\text{vap}} = X_{\text{solvent}} P^{\circ}_{\text{solvent}}$

# Solids

- A. Crystalline materials
- B. Molecular solids
- C. Metals
- D. Network solids
- E. Amorphous solids
- F. Crystal Field theory (why gems are colored).

# X-ray crystallography

# Crystal Lattice

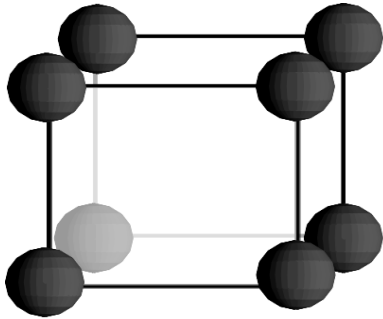
Chang Fig. 12.14

Chang fig. 12.21

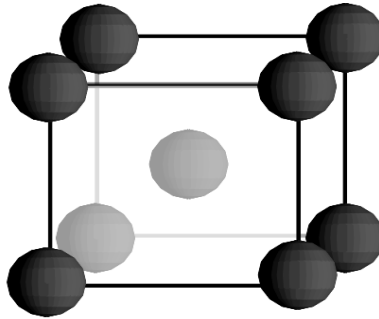
# Bragg Equation

- $n\lambda = 2d\sin\theta$ 
  - $n$  = an integer      -  $\lambda$  = x-ray wavelength
  - $d$  = distance between planes in crystal
  - $\theta$  = angle as shown before at which constructive interference occurs.
- **YOU ARE NOT EXPECTED TO DO CALCULATIONS WITH THIS EQUATION!!!**

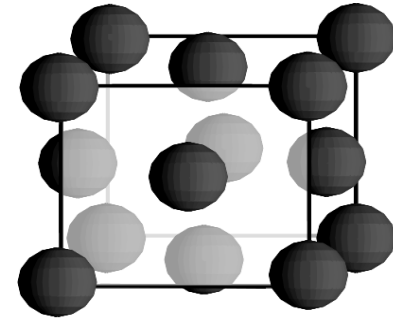
# Primitive Cubic Lattices



Simple Cubic



Body Centered Cubic



Face Centered Cubic

Chang Figure 12.17

# Where atoms touch in bcc crystal

