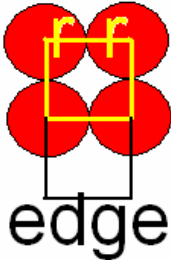
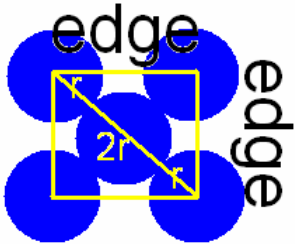
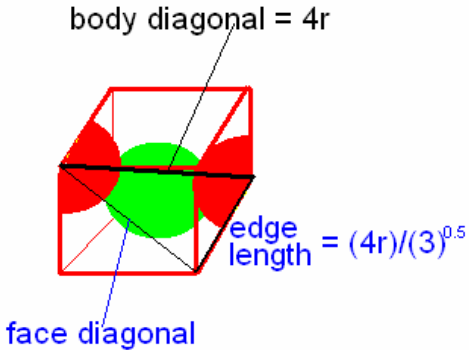


CHEM 122 -- Problem Set 7

General Rules – a little more compact and user friendly than from lecture – MEMORIZE ‘em	
<p>SCC edge = $2r$ r = radius of atom</p>	
<p>FCC edge length = $(4r)/\sqrt{2}$ r = radius of atom</p>	
<p>BCC edge length = $(4r)/\sqrt{3}$ r = radius of atom</p>	

- 1) X-ray diffraction measurements show that Cu crystallizes in a FCC lattice with a unit cell length of 0.3615 nm. Determine the atomic radius of Cu.
- 2) Silver crystallizes in a FCC lattice with a unit cell edge length of 0.408 nm. Calculate the atomic radius of the Ag.
- 3) Fe crystallizes in a BCC lattice with a unit cell edge of 0.286 nm. What is the atomic radius of the iron?
- 4) Nickel crystallizes in a FCC arrangement. The edge of a unit cell is 0.352 nm. Determine the atomic radius of the Ni.
- 5) Lead crystallizes in a FCC unit cell measuring 495 pm on an edge – what is the atomic radius of the Pb?

- 6) Potassium crystallizes in a BCC unit cell measuring 533 pm on the edge. What is the atomic radius of the K?
- 7) Mn atoms have an atomic radius of 129 pm and crystallize in a BCC unit cell. What is the edge length of the cell?
- 8) Chromium crystallizes in a BCC lattice with an edge measurement of 288 pm. What is the atomic radius of the Cr?
- 9) Vanadium crystallizes in a BCC lattice with an edge length of 301 pm. What is its atomic radius?
- 10) Au crystallizes in a FCC lattice with an edge length of 407 pm. What is its atomic radius?

Use the following table for the next 10 questions (11-20)
(NOT all discussed in class – see answer key for method):

Element	Density (g/cm ³)	MW (g/mol)	Element	Density (g/cm ³)	MW (g/mol)
Ag	10.6	108	K	0.862	39
Au	19.3	197	Mn	7.43	55
Cr	7.2	52	Ni	8.90	59
Cu	8.934	64	Pb	11.3	204
Fe	7.87	56	V	5.96	51

- 11) Determine the number of atoms in the arrangement and Avogadro's number for the info in #1.
- 12) Determine the number of atoms in the arrangement and Avogadro's number for the info in #2.
- 13) Determine the number of atoms in the arrangement and Avogadro's number for the info in #3.
- 14) Determine the number of atoms in the arrangement and Avogadro's number for the info in #4.
- 15) Determine the number of atoms in the arrangement and Avogadro's number for the info in #5.
- 16) Determine the number of atoms in the arrangement and Avogadro's number for the info in #6.
- 17) Determine the number of atoms in the arrangement and Avogadro's number for the info in #7.

- 18) Determine the number of atoms in the arrangement and Avogadro's number for the info in #8.
- 19) Determine the number of atoms in the arrangement and Avogadro's number for the info in #9.
- 20) Determine the number of atoms in the arrangement and Avogadro's number for the info in #10.