

# Homework #4

September 28 (for weekly quiz on Tuesday, October 5)

**From the text,**

Chapter 5: 5, 47, 49, 51, 55 (2<sup>nd</sup> ed.); 5, 23, 25, 27, 31 (1<sup>st</sup> ed.)

Chapter 4: 34, 37, 42, 51, 59, 86, 87, 88, 111, 113, A5, A6 (2<sup>nd</sup> ed.); 17, 20, 26, 35, 43, 57, 58, 59, 75, 77, A-2 and A-3 (1<sup>st</sup> ed.).

**Additional questions:**

1. Estimate the ionic radius of  $\text{Cs}^+$ . The lattice energy of  $\text{CsCl}$  is 633 kJ/mol. For  $\text{CsCl}$  the Madelung constant is 1.763, and the Born exponent,  $n$ , is 10.7. The ionic radius of  $\text{Cl}^-$  is known to be 1.81 Å.
- 2.(a) CFCs have been implicated in ozone depletion. Show that when Freon 12 ( $\text{CCl}_2\text{F}_2$ ) is exposed to ultraviolet radiation, the compound decomposes to produce chlorine.
  - (b) Draw the Lewis structure of Freon 12 and indicate the polarities of each bond within this compound.
  - (c) Determine the percent ionic character of the C-Cl and C-F bonds.

**DATA:****Average Bond Energies (kJ/mol)**

<u>Single Bonds</u>		<u>Multiple Bonds</u>	
H-H	435	C=C	610
F-F	155	C≡C	836
Cl-Cl	242		
C-C	347		