

Homework #4

(for weekly quiz)

From the text,

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

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

Additional questions:

1. Estimate the ionic radius of Cs^+ . The lattice energy of CsCl is 633 kJ/mol. For CsCl the Madelung constant is 1.763, and the Born exponent, n , is 10.7. The ionic radius of Cl^- is known to be 1.81 Å.
- 2.(a) CFCs have been implicated in ozone depletion. Show that when Freon 12 (CCl_2F_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 | | |