REVIEW QUESTIONS
Chapter 9

1. For each set shown below, select the atoms or ions that are isoelectronic with each other, and write their electron configuration:

   a) K^+, Rb^+, Ca^{2+}

   b) S^{2-}, Ar , Se^{2-}

   c) Mg^{2+}, Cl^-, Al^{3+}

2. Explain each of the following trends in ionic radii:

   a) $I^- > I > I^+$

   b) $Ca^{2+} > Mg^{2+} > Be^{2+}$

3. Arrange the atoms or ions in each of the following sets in order of increasing radius:

   a) Br^- , Na^+ , Mg^{2+}

   b) Ar, Cl^-, S^{2-}

   c) Co^{3+}, Fe^{2+}, Fe^{3+}

   d) K^+ , Cl^-, Ca^{2+}, P^{3-}

4. Draw Lewis structures for each of the following structures and assign formal charges to each atom:

   a) SF_2

   b) NH_2OH (N and O are bonded to one another)

   c) PO_4^{3-}

   d) I_3^-

5. Draw two possible resonance structures for the isocyanate ion (NCO^-) and using formal charges determine which structure is more plausible.

6. Arrange the bonds in each of the following sets in order if increasing polarity:

   a) C — S B — F N — O

   b) O — Cl S — Br C — P

7. Classify each of the following bonds as ionic, polar covalent or non-polar covalent:

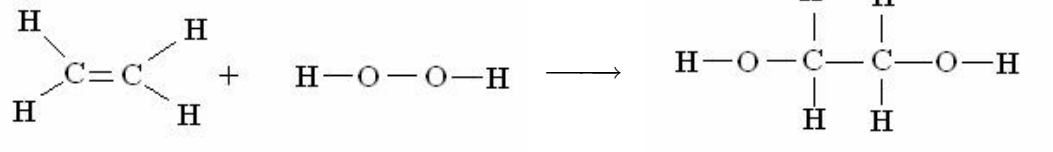
   a) B — Cl _____

   b) Mg — Br _____

   c) Cl — Cl _____

   d) Na — Br _____

8. Use bond energies listed in Table 9.5 in your textbook to find ΔH for the reactions shown below:

   a) 

   b) $CH_2NH + H_2O \longrightarrow CH_2O + NH_3$

9. Use the data provided below to calculate the lattice energy of RbCl. Is this value greater or less than the lattice energy of NaCl? Explain.

Electron affinity of Cl = –349 kJ/mol
1^{st} ionization energy of Rb = 403 kJ/mol
Bond energy of Cl_2 = 242 kJ/mol
Sublimation energy of Rb= 86.5 kJ/mol
ΔH_f [RbCl (s)] = –430.5 kJ/mol

10. Arrange the following compounds in order of increasing lattice energy:

NaF CaO CsI