**CHE1031 Module 7 Quiz: Chemical bonding**

*This is a take-home quiz. You may use any and all resources to answer the questions. However, be aware that this will not be the case for exams and quizzes are a chance to prepare for exams.*

* *Please show all work for full & partial credit.*

**7.1: Ionic bonding**

**1.** Write the electron configuration for each of the following ions:

(a) I–1

(b) Be+2

(c) O-2

(d) Li+1

(e) N-3

**7.2: Covalent bonding**

**2.** Identify the more polar bond in each of the following pairs of bonds:

(a) HF or HCl

(b) SH or OH

(c) PCl or SCl

**7.3: Lewis symbols and structures**

**3.** Write the Lewis symbols of the ions in each of the following ionic compounds and the Lewis symbols of the atom from which they are formed:

(a) K2O

(b) Li3N

(c) KF

**4.** Write Lewis structures for the following:

(a) NH4+1

(b) BF4−1

(c) HCCH

(d) ClCN

**7.4: Formal charges and resonance**

**5.** Write resonance forms that describe the distribution of electrons in each of these molecules or ions.

(a) selenium dioxide, OSeO

(b) benzene, C6H6:

(c) the formate ion, HCO-1





**6.** Calculate the formal charge of each element in the following compounds and ions:

(a) NO–1

(b) BF4−1

**7.5: Strengths of ionic and covalent bonds**

**7.** Using the bond energies in Table 7.2, determine the approximate enthalpy change for each of the following reactions:

(a) Cl2(g) + 3F2(g) ⟶ 2ClF3(g)

(b) H2C=CH2(g) + H2(g) ⟶ H3CCH3(g)

(c) 2C2H6(g) + 7O2(g) ⟶ 4CO2(g) + 6H2O(g)

**8.** The lattice energy of LiF is 1023 kJ/mol, and the Li–F distance is 201 pm. MgO crystallizes in the same structure as LiF but with a Mg–O distance of 205 pm. Which of the following values most closely approximates the lattice energy of MgO: 256 kJ/mol, 512 kJ/mol, 1023 kJ/mol, 2046 kJ/mol, or 4008 kJ/mol? Explain your choice.