**CHE1031 Module 8 Quiz: Thermochemistry**

*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.*

**8.1: Energy basics**

**1.** Explain the difference between heat capacity and specific heat of a substance.

**2.** Calculate the heat capacity, in joules and in calories per degree, of these samples. A tableof specific heat values is posted on the Module 8 web page.

(a) 28.4 g of water

(b) 1.00 oz of lead

**3.** A piece of unknown solid substance weighs 437.2 g, and requires 8460 J to increase its temperature from 19.3°C to 68.9 °C.

(a) What is the specific heat of the substance?

(b) If it is one of the substances found in Table 5.1, what is its likely identity?

**8.2: Calorimetry**

**4.** A 70.0-g piece of metal at 80.0 °C is placed in 100 g of water at 22.0 °C contained in a calorimeter like that shown in Figure 5.12. The metal and water come to the same temperature at 24.6 °C. How much heat did the metal give up to the water? What is the specific heat of the metal?

**8.3: Enthalpy**

**5.** How much heat is produced when 100 mL of 0.250 M HCl (density, 1.00 g/mL) and 200 mL of 0.150 M NaOH (density, 1.00 g/mL) are mixed?

HCl(aq) + NaOH(aq) ⟶ NaCl(aq) + H2 O(l) ΔH°298 = −58 kJ

If both solutions are at the same temperature and the heat capacity of the products is 4.19 J/g °C, how much will the temperature increase? What assumption did you make in your calculation?

**6.** Calculate ΔH°298 for the process Zn(s) + S(s) + 2O2(g) ⟶ ZnSO4(s) from the following information:

Zn(s) + S(s) ⟶ ZnS(s) ΔH°298 = −206.0 kJ

ZnS(s) + 2O2(g) ⟶ ZnSO4(s) ΔH°298 = −776.8 kJ