Name _____ Period _____ Date _____

Thermochemistry Worksheet 1

For problems 1, 2, and 3, write the balanced equations for each of the following chemical reactions and determine the heat energy produced per mole of reactant.

1) When 4 g of beryllium chloride reacts with 25 g of silver nitrate in 25 g of water, aqueous beryllium nitrate and silver chloride powder are produced (ΔT = +27 K).

2) When isopropanol (C_3H_8O) burns in oxygen, carbon dioxide, water, and heat are produced. This reaction is performed inside a sealed vessel submerged in a vessel of water with an excess of oxygen in the vessel. At completion, the water temperature rises 39 K.

3) When 35 g of sodium hydroxide reacts with an excess of sulfurous acid (H_2SO_3), aqueous sodium sulfite, water, and heat are formed. specific heat for H_2SO_3 = 1.0 j/gK

4) A vessel of water (15 mL) at a temperature of 290 K is cooled by placing it into a vessel of ethanol (C_2H_5OH) (35 mL) at a temperature of 240 K. What is the equilibrium temperature for the two vessels of liquid. (density of water = 1.0 g/mL and density of ethanol = 0.789 mg/L).

5) A vessel of water at a temperature of 30° C is heated by placing it into a vessel of glycerine ($C_3H_5(OH)_3$) (100 mL) at a temperature of 323 K. The equilibrium temperature for the two vessels of liquid was 37° C. What was the volume of water used? (density of glycerine = 1.261 g/mL)