Regents Chemistry
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Calorimetry Problems Worksheet 1

Note: the specific heat of water = 4.18 J/g^{o}C

1. A reaction takes place in a calorimeter containing 400.0 g of water at an initial temperature of 22.5^{o}C. The temperature of the water decreases to 17.0^{o}C.

    a) Was the reaction endothermic or exothermic? Explain.

    b) Calculate the amount of heat energy involved in the reaction.

2. Exactly 55 kJ of heat is added to a calorimeter containing 250.0 g of water at an initial temperature of 23.0^{o}C. Determine the final temperature of the water.

3. A sample of water absorbed 5650 J of heat resulting in a temperature change of 9.0^{o}C. Determine the mass of water.

4. A 30.5 g sample of a metal at a temperature of 97.0^{o}C is immersed in 100.0 g of water at a temperature of 21.0^{o}C.

    a) What will happen to the temperature of the metal? Explain.

    b) What will happen to the temperature of the water? Explain.

    The final temperature of both the metal and the water was measured to be 23.5^{o}C. Determine the specific heat of the metal.

5. If a 200.0 g sample of water at a temperature of 15.0^{o}C is mixed with a 100.0 g sample of water at 82.0^{o}C, what will be the final temperature of the water?

6. A substance undergoes combustion in a calorimeter and the following data are obtained:

Mass of water in calorimeter:	102.8 g
Initial temperature of water	24.0°C
Final temperature of water	73.1°C
Mass of sample burned:	6.70 g

Determine the heat of combustion of the substance and express your answer in kJ per gram of substance burned.

If the molar mass of the substance is 78.0 g/mol, determine the heat of combustion in kJ/mol.