Calorimetry Worksheet

1. A swimming pool, 20.0 m x 12.5 m, is filled with water to a depth of 3.75 m. If the initial temperature of the water is 18.4°C, how much heat must be added to the water to raise the temperature to 29.0°C? Assume that the density of water is 1.000 g/mL.

2. A 75.0 g sample of a metal is placed in boiling water until its temperature is 100.0°C. A calorimeter contains 100.00 g of water at a temperature of 24.4°C. The metal sample is removed from the boiling water and immediately placed in water in the calorimeter. The final temperature of the metal and water in the calorimeter is 34.9°C. Assuming that the calorimeter provides perfect insulation, what is the specific heat of the metal? The specific heat of water is 4.184 J/(g°C).

3. A 30.0 g sample of water at 280 K is mixed with 50.0 g of water at 330 K. Calculate the final temperature of the mixture assuming no heat loss to the surroundings. Remember that the heat gained by the cooler water is equal to the heat lost by the warmer water.

4. A 70.0 g sample of water at 95.00°C is mixed with 50.0 g of water at 135.0°C. Calculate the final temperature of the mixture assuming no heat loss to the surroundings. Remember that the heat gained by the cooler water is equal to the heat lost by the warmer water.