Calculating Heat

1. How much heat is needed to bring 12.0 g of water from 28.3°C to 43.87°C, if the specific heat capacity of water is 4.184 J/(g°C)?

2. How much heat is released when 14[illegible] g of ice is cooled from 14 °C to – 75 °C, if the specific heat capacity of ice is 2.087 J/(g°C)?

3. When 105 mL of water at 25 °C is mixed with 83 mL of water at 50 °C, what is the final temperature of the water? Assume that no heat is lost to the surroundings and that the density of water is 1.00 g/mL.

4. An unknown volume of water at 14.0 °C was added to 85.[illegible] mL of water at 37.0 °C. If the final temperature was 28.0 °C, what was the unknown volume? Assume that no heat is lost to the surroundings and that the density of water is 1.00 g/mL.

Determining Specific Heat Capacity

5. An alloy of unknown composition is heated to 115 °C and placed into 200.0 g of water at 22.0 °C. If the final temperature of the water was 28.4 °C, and the alloy weighed 175 g, what is the specific heat capacity of the alloy? The specific heat of water is 4.184 J/g°C.

6. A 45.0 g rock is heated to 87.2 °C and placed into 75.1 g of water originally at 22.0 °C. If the final temperature of the water was 46.3 °C, what is the specific heat capacity of the rock?

7. Given that the specific heat of gold is 0.129 J/g°C, calculate the final system temperature if a 100.0 g block of gold at 100.0 °C is placed in a coffee cup calorimeter containing 50.0 g of water at an initial temperature of 25.0 °C.

1. How many calories are needed to raise the temperature of exactly 100 g of water from 22.12°C to 24.58°C?

2. How many joules are released when 80.0 mL of chloroform cool 10.0°C? The s pecific heat of chloroform is 0.971 J/(g°C) and its density is 1.50 g/mL.

3. The specific heat of benzene is 1.80 J/(g°C). Suppose that you have a 200 g sample of benzene at 45.0°C and remove 1.465 kJ. What does its temperature become?

4. Determine the specific heat of Cu from the fact that 68.0 J are needed to raise the temperature of 15.0 g of Cu metal from 23.0°C to 28.0°C.

6.10 Calculate q when 12.0 g of water is heated from 20°C to 100 °C.