Heat and Calorimetry CW/HW

Name:

Period: 1 4

Directions: Solve each problem, show all your work and make sure your answers have the correct amount of significant figures and units!

1. The heat capacity of aluminum is 0.900 J/g°C.
   1. How much energy is needed to raise the temperature of a 8.50 × 102 g block of aluminum from 22.8°C to 94.6°C?
2. A coffee cup calorimeter initially contains 125g of water, at a temperature of 24.2°C. Potassium bromide (10.5g) is added to the water, and the final temperature is 21.1°C. What is the heat of solution (the heat flow accompanying the dissolving the salt) of potassium bromide? Assume the heat capacity of the solution is 4.184 J/g°C and that no heat is transferred to the surroundings or to the calorimeter?
3. A coffee cup calorimeter is filled with 100.0mL of water at a temperature of 20.0°C. A 0.35g peanut is burned in the calorimeter, heating the water to a final temperature of 26.6°C. The heat capacity of water is 4.184 J/g°C. Assuming there is no heat lost to the surroundings or absorbed by the calorimeter,
   1. What is the amount of heat absorbed by the water?
   2. What is the amount of heat given off by the peanut?
4. A swimming pool, 10.0m by 4.0m is filled to a depth of 3.0m with water at a temperature of 20.2°C. How much energy is required to raise the temperature of the water to 30.0°C? The density of water is 1.00 kg/m3.

(mass = density × volume)

(volume = length × width × height)

1. A 28.2g sample of nickel is cooled to 10.0°C and is placed in a coffee cup calorimeter containing 150.0g of water at a temperature of 23.5°C. After the system comes to equilibrium, the final temperature is 16.0°C. The heat capacity of water is 4.184 J/g°C. Assuming no heat is lost to the system or absorbed by the calorimeter,
   1. How much heat is released from the water?
   2. How much heat did the nickel absorb?