Chemistry SPECIFIC HEAT PRACTICE (#1)

Show all work, and watch sig.figs.

$q = m\ c\ \Delta T$

heat lost by metal = heat gained by water

$-[(m_m)(c_m)(\Delta T_m)] = (m_w)(c_w)(\Delta T_w)$

$-[(m_m)(c_m)(T_{final,\,m} - T_{initial,\,m})] = (m_w)(c_w)(T_{final,\,w} - T_{initial,\,w})$

SIMPLE SPECIFIC HEAT

1) How much energy must be absorbed by 20.0 g of water to increase its temperature from 283.0 °C to 303.0 °C? (c of water = 4.184 J/g °C)

2) When 15.0 g of steam drops in temperature from 275.0 °C to 250.0 °C, how much heat energy is released? (c of water = 4.184 J/g °C)

3) How much heat, in J, is given out when 85.0 g of lead cools from 200.0 °C to 10.0 °C? (c of lead = 0.129 J/g °C)

4) If it takes 41.72 joules to heat a piece of gold weighing 18.69 g from 10.0 °C to 27.0 °C, what is the specific heat of the gold?

5) A certain mass of water was heated with 41,840 Joules, raising its temperature from 22.0 °C to 28.5 °C. Find the mass of the water, in grams. (c of water = 4.184 J/g °C)

6) When a 120 g sample of aluminum (Al) absorbs 9.612 kJ of energy, its temperature increases from 25°C to 115°C. Find the specific heat of aluminum.

7) The specific heat of lead (Pb) is 0.129 J/g °C. Find the amount of heat released when 2.4 mol of lead are cooled from 37.2°C to 22.5°C.

ADVANCED CALORIMETRY

8) If 150.0 grams of iron at 95.0 °C, is placed in an insulated container containing 500.0 grams of water at 25.0 °C, and both are allowed to come to the same temperature, what will that final temperature be? The specific heat of water is 4.184 J/g °C, and the specific heat of iron is 0.444 J/g °C).

9) When 80.0 grams of a certain metal at 90.0 °C was mixed with 100.0 grams of water at 30.0 °C, the final equilibrium temperature of the mixture was 36.0°C. What is the specific heat of the metal?

10) A 33.50 g piece of chemium metal is heated thoroughly in a boiling water bath. The calorimeter is filled with 475.0 mL of water. The room's temperature is 22.5 °C. The final calorimeter temperature at the end of the experiment is 28.5 °C. What is the specific heat of chemium metal?