FLINN SCIENTIFIC

Name_____

Laboratory Report

What Is an Instant Cold Pack?

Name of solid	
Warning	
Formula of solid	
Molar mass	
Mass of solid	
Moles of solid	
Volume of water	

Measuring the Heat of Solution—Procedure

Measuring the Heat of Solution—Data Table

Post-Lab Questions

1. For each trial, calculate the **heat energy change in joules** when the cold pack solid dissolved in water. **Recall:** $q = m \times s \times \Delta T$, and assume that s (specific heat) is equal to 4.18 J/g·°C. Discuss the meaning of the **sign** for q.

2. Calculate the energy change in **joules per gram of solid** for the cold pack solid dissolving in water. Note the sign of the energy change.

3. Calculate the energy change in units of **kilojoules per mole** of solid for the cold pack solid dissolving in water. To do this:

   a. Convert the heat energy change found in Question 1 to kilojoules.

   b. Convert the grams of solid used in the experiment to moles.

   c. Divide the energy change in kilojoules by the number of moles of solid to determine the energy change in units of kJ/mole. If more than one trial was performed, calculate the **average value** of the heat of solution also.

4. Using the result from Question 3c and the information obtained for a commercial cold pack, calculate the kilojoules of heat energy transferred when the entire cold pack is activated. How cold will the instant cold pack's solution become?

5. Circle or highlight the correct choices in the following sentence to summarize the heat change that occurs when the commercial cold pack is activated.

   "When the white solid in the commercial cold pack dissolves in water, the pack feels (hot/cold) because the temperature of the solution (increases/decreases). Energy is (released/absorbed) from the surroundings during this reaction and the reaction is classified as (endothermic/exothermic). The sign of ΔH for the heat of solution is (positive/negative)."