Name: _____ Group: _____ Date: _____

LAB 19 EXPERIMENT

THE AMOUNT OF ENERGY INVOLVED DURING DISSOLUTION

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Goal

Determine if the variation of temperature during dissolution is the same for different substances.

1. What is the independent variable in this lab?

_____

2. What is the dependent variable in this lab?

_____

Hypothesis

I think _____

because _____

Materials

- wash bottle of distilled water
- 25-mL graduated cylinder
- polystyrene foam cup
- thermometer
- spatula
- container of table salt (NaCl)
- weighing pan
- balance (accurate to 0.01 g)
- container of ammonium chloride (NH_4Cl)
- container of calcium chloride ($CaCl_2$)

Procedure

1. Measure into the graduated cylinder 20 mL of distilled water.
2. Pour the water into the polystyrene foam cup.
3. Measure and record the initial temperature of the water.
4. Weigh 5.00 g of one solute.
5. Add the solute to the cup.
6. Stir slowly with the thermometer until dissolution is complete.
7. Measure and record the final temperature of the solution.
8. Empty and rinse the cup.
9. Repeat steps 1 to 8 for the two remaining solutes.
10. Clean up and put away materials.

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Results

Record your results in the table below. Give the table a title.

Title:

Solute	Mass of solute (g)	Initial temperature (^{o}C)	Final temperature (^{o}C)

Analysis of the results

1. Is variation of temperature the same for each solute?

_____

2. Which of the dissolutions involve absorption of energy? Explain your answer.

_____

_____

3. Which of the dissolutions involve release of energy? Explain your answer.

_____

4. What are the possible sources of error in this lab?

_____

5. How could you improve the protocol for this lab?

_____

Conclusion

1. Complete the following sentences:

a) When dissolution releases energy, the temperature of the solution _____.

b) When dissolution absorbs energy, the temperature of the solution _____.

2. Was your hypothesis confirmed or not? Explain your answer.

_____

Application

Which substance could be used to make a cooling pack? Explain your answer with the help of the results of tests you performed.

_____

_____