10 van't Hoff Determination (1073237)

Question | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12

Instructions

Purpose: To determine the experimental van't Hoff factor for iron(III) chloride at two different concentrations.

Equipment: ice,table salt, extra large size test tube, GoTemp probe and Logger Lite software, insulated cup, 150 mL beaker, 50 mL graduated cylinder, distilled water, magnetic stirrer, magnet

Procedure:

(The instructor should determine the empirical freezing point of pure water on the day of the lab while students set up the lab.)

1. Connect a temperature probe to an empty USB port on a computer with "Logger Lite" software. Open the program "Logger Lite". Go to the "Experiment" menu and choose "Data Collection". Change the length to 900 seconds and type in 3 seconds/sample. Samples to be collected should be 301.

2. Obtain an insulated cup. Fill the insulated cup about 1/3 full of ice. Sprinkle about 10 g of salt over the ice. Fill the cup with ice until it is about 2/3 full of ice. Sprinkle another 10 g of salt over the ice.

3. Pour 0.05 m Iron(III) chloride solution solution into an extra large test tube to fill it about 33% full.

4. Place a small magnet into the test tube.

5. Place the temperature probe into the test tube of iron(III) chloride solution. Make sure the magnet does not stick to the probe. Try to keep the probe in the middle of the test tube (not touching the glass). Place the test tube into the ice bath and attach the battery to the magnetic stirrer. Begin taking readings and determine the freezing point of the solution. Make amends for supercooling. You may need to add more ice and salt during the experiment.

6. Repeat the process (steps 6 and 7) with a solution of 0.20 m iron(III) chloride.

7. Determine the Van't Hoff factor for the two solutions.

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1. Question Details Objective and procedure summary [3413760]

Restate the objective in your own words using complete sentences. Summarize the steps in your procedure. (Be sure and include any safety concerns).

2. Question Details AP van't Hoff Factor Data [1763820]

a. Enter the empirical freezing point of the pure water: [4.0] [ ] °C

b. Enter the empirical freezing point of the 0.050 m solution of $FeCl_3$: [4.0] [ ] °C

c. Enter the empirical freezing point of the 0.20 m solution of $FeCl_3$: [4.0] [ ] °C

d. Calculate the Van't Hoff factor for the 0.050 m solution: [4.0] [ ]

e. Calculate the Van't Hoff factor for the 0.20 m solution: [4.0] [ ]

3. Question Details Van't Hoff #05 [1249395]

What mass of $FeCl_3 * 6H_2O$ is needed to make a 0.20 m solution with 50.0 g water? [ ] g

4. Question Details Van't Hoff #06 [1249430]

What is supercooling?

5. Question Details Van't Hoff #07 [1249447]

What is the expected van't Hoff factor for $FeCl_3$? [ ]

6. Question Details Van't Hoff #08 [1249450]

What is the expected van't Hoff factor for $C_{12}H_{22}O_{11}$? [ ]

7. Question Details Van't Hoff #09 [1249451]

Compare the expected van't Hoff factor to the empirical van't Hoff factor. Explain the results.

8. Question Details Van't Hoff #10 [1249452]

Compare the empirical van't Hoff factor of the 0.05 m solution to the 0.20 m solution. Explain the results.

9. Question Details Upload Calculations (Show Work) [3418656]

Upload a photo of your calculations, showing your work. Make sure your name and the date are written on the page. Title the image with a unique file name before you upload it.(Maybe use your initials and part of the lab title and the word Calcs)
Choose File no file selected

10. Question Details Upload Lab Photo [3413757]

Upload a photo of the lab apparatus with your face in the photo as you perform some part of the lab. Title the image with a unique file name before you upload it.(Maybe use your initials and part of the lab title) Choose File no file selected It must be less than 5 MB in size.

11. Question Details Observations, Skills utilized and learning [3413764]

What observations did you make during the lab? What chemistry concepts, laws, and/or skills were necessary to complete this lab? What did you learn or re-learn? Use complete sentences.

12. Question Details Upload Lab Graph [3414163]

Upload a photo of the graph you created in Data Analysis or Logger Lite. Choose File no file selected It must be less than 5MB in size.

Assignment Details

Name (AID): **10 van't Hoff Determination (1073237)**
Submissions Allowed: **5**
Category: **Lab**
Code:
Locked: **Yes**
Author: **Ryan, Matt (** mryan@allsaintsschool.org **)**
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