

Chemistry Lab: Crystallization of a Supersaturated Sucrose Solution

Lab Notebook Preparation

Introduction:

Purpose:

Tell WHAT you are going to do and HOW you are going to do it. Be sure you include the scientific terms for what you are going to be discovering. Read the entire lab before you write. (HINT: observe the behavior of a sucrose solution at 150° C and at 23° C — but that's not ALL you need!) Remember, detailed information and explanations will follow. **This is brief.**

Terms:

Define the following terms in your introduction: sucrose, solution, saturated, supersaturated, crystallization, solubility.

Background:

Remember, the reader has NO IDEA what any of these concepts are, or what you expect them to know. A good test of your abstract and introduction would be to let a non-chemist read them and see if they can explain the experiment to you when they finish reading.

Discuss the solubility of sucrose with respect to the proportions you will be using.

Using the information in your chemical data table, calculate the following:

- Mass of sucrose, fructose/glucose, water used
- Amount of sucrose that could be dissolved in the mass of water used at 20° C
- Amount of sucrose that could be dissolved in the mass of water used at 100° C
- Amount of water theoretically needed to dissolve the mass of sucrose used
- Molarity of a solution of only the sucrose and water used.

Explanation:

Explain how these concepts will be demonstrated in the process of making candy.

Source: this handout; references used for chemical data

Safety: goggles and aprons will be worn. Long hair will be confined.

PRELAB:

Chemical Data Table (as complete as you can make it) LH

Safety precautions (heat, sanitation, PPE) LH

Introduction

Materials list (given; attach),

Procedure (given, attach)

Data Table:

- Read the procedure and analysis questions carefully.
- Include in your table a place to record your observation of each question or directive to observe.
- Pre-label the table with the observations you intend to make.

***No credit will be given for lab until your work area has been inspected.**

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Analysis and Conclusion

Data Analysis: Answer in complete sentences that include the question.

1. Describe ingredients prior to mixing.
2. Describe ingredients after initial mixing.
3. Describe what you saw as the solution heated.
4. At about what temperature was all of the solute dissolved?
5. What do you think would happen if you heated the mixture only to 100°C? To 190°C? Explain each.
6. Water boils at 100°C. When it reaches that temperature, it turns to steam but the temperature does not increase.
7. This solution contains water, yet its temperature rose to 160°C. How could you explain this?
8. At what point in the procedure was the solution supersaturated?
9. Why was it necessary to cool the solution before adding the ester?
10. What evidence do you have that the solution was supersaturated? That it crystallized?
11. At each point in the procedure, tell whether the solution was unsaturated, saturated, or supersaturated and explain the reason for your decision.
12. What techniques did you use to dissolve the sucrose?
13. What factors affected the AMOUNT of sucrose that could be dissolved in the water?
14. What factors affected the RATE at which the sucrose dissolved?

Conclusion: In scientific terminology, answer and explain each question.

- What was the purpose of your work?
- What did you see to show that you accomplished your purpose?
- What suggestions would you have for someone wanting to replicate your work?