

# LABORATORY EXPERIMENT: SALTWATER TO SALT

## Introduction:

This laboratory investigation has many chemistry concepts but we will limit the applications to the following:

- Contrast physical properties and changes versus chemical properties and changes.
- Contrast homogeneous mixtures, solutions, versus heterogeneous mixtures.
- Contrast elements versus compounds.

Sodium chloride is the substance which you might commonly refer to as salt. Sodium chloride is a pure substance composed of two elements, sodium and chlorine, which are chemically bonded so it is a compound and not an element. Water is also a pure substance composed of two elements, hydrogen and oxygen, which are chemically bonded so it too is a compound and not an element. In this lab, you are going to mix sodium chloride with water to form a homogeneous mixture, more commonly called a solution. Recalling to mind the definitions of physical and chemical properties, you will note that a physical property can be determined without altering the identity of a substance whereas a chemical property can only be determined by altering the identity of the substance. Since changes of state are physical properties, you will be able to prove that saltwater is a mixture by separating the component parts, salt and water, by a physical change, vaporization of the water.

## Objective:

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## Materials:

- ring stand
- iron ring
- evaporation dish
- watch glass
- 100 mL beaker
- stirring rod
- tongs
- striker
- Bunsen burner and tubing
- Sodium chloride

## Procedure:

- Add a spatula of salt to approximately 50 mL of water in the 100 mL beaker. Stir using the stirring rod to help the dissolving process.
- Attach the Bunsen burner and tubing to the gas supply.
- Attach the iron ring to the ring stand.

4. Place the evaporation dish in the iron ring and pour some of the salt water into the dish using the decanting procedure. (Your teacher will demonstrate this decanting procedure to you). Cover the dish with the watch glass placed concave on the dish.
5. Place the Bunsen burner beneath the evaporation dish. Light the burner and adjust to a cool flame. The water should begin to boil which will allow the salt to separate from the solution.
6. After the water has completely vaporized leaving the salt, turn off the burner and allow the dish to cool.
7. After the evaporation dish is cool, remove the watch glass using the tongs.
8. Please note the difference in the form of the salt crystals after they have been forced to re-crystallize so quickly.
9. Clean the equipment by washing the salt from the watch glass and the evaporation dish. Replace all the equipment on the cart for use by the next class. Wipe all lab areas.

**Observations:**

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**Questions:**

1. What evidence do you note which indicates a physical change has occurred?

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2. Explain why this is a physical change and not a chemical change.

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3. What do you observe which would indicate this mixture is homogeneous and not heterogeneous?

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**Conclusion:**

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# RUBRIC FOR LABORATORY REPORTS

**All lab reports must contain the following items:**

1. Name of lab
2. Objective
3. Procedure
4. Observations
5. Calculations (if any are necessary)
6. Conclusion

1. **Excellent** – Lab report contains all required areas listed above, each of which contains substantial information to support findings or opinions. 25 points
2. **Good** – Lab report contains all required areas listed above, each of which contains sufficient information to support findings or opinions . 23 points
3. **Satisfactory** – Lab report has all required areas listed above, with limited information to support findings or opinions. 21 points
4. **Average** – Lab report has missing areas from those listed above, or has little information to support findings or opinions. 19 points
5. **Poor** – Lab report has missing areas from those listed above, what is included does not support findings or opinions. 17 points
6. **Unsatisfactory** – Lab report has few of the required areas from those listed above, does not contain any information to support findings or opinions or has erroneous information supporting findings or opinions. 15 points