

Review and apply Investigation 2

Let's review

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1. **One of the tests you did to learn about and compare the crystals was a dissolving test. Describe how you conducted the dissolving test.**

Explain what you did to control variables that might affect dissolving such as amount of water, temperature of water, amount of swirling, etc.

Students should describe controlling variables such as the following:

- Using equal amounts of each crystal—10 paperclips or 5 grams worth.
- Dissolving each crystal in 1 teaspoon of hot tap water.
The amount and temperature of water used to dissolve each crystal was the same.
- Pouring the crystals into the water at the same time.
- Swirl each cup in the same way for the same length of time.

After mixing the crystals and water, students carefully poured the solution from each clear plastic cup back into the small empty cup. Then they compared the amount of crystal remaining in each cup to the amount of crystal remaining in the “unknown” cup.

2. **You also did a recrystallization test. Explain what you did to control the variables in this test.**

Students either used the “24-hour method” or the “Same-day method”. With the “24-hour method”, students placed each solution in identical larger clear plastic cups. These solutions were placed in the same location and allowed to recrystallize overnight. With the “Same-day method”, students placed a similar amount of solution on similarly treated black circles. Since these solutions were all placed on the same piece of paper, they were all allowed to recrystallize in the same conditions.

Science in action!

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Students should conduct all of the tests conducted during the investigation—appearance, crushing, solubility, and recrystallization—on potassium chloride and sodium chloride. On the activity sheet, they should explain how they conducted each test and record their observations. Then students should design their own absorption test. Students should describe their original test and how they plan to control variables. After conducting the test, students will record their observations on the activity sheet.

Think about it

Pages 118-119

- 1. The reading suggests that salt deposits could have caused entire towns to be built. This is because...**
 - a. Where there is salt, there is water.
 - b. Where there is salt, it is easier to grow crops.
 - c. Animals like salt.
 - d. Salt was very useful and valuable.
- 2. In history, salt has been used as a *preservative*. Re-read the “Uses for salt” section. What is the main reason for using a preservative?**
 - a. Makes food taste better
 - b. Makes it harder for bacteria to live and grow
 - c. To help make roads safer in winter
 - d. To make soap and detergent
- 3. Salt is found dissolved in the oceans. In this sentence, what does the word “dissolve” mean?**
 - a. Water and salt are completely mixed, making salt water.
 - b. Salt is found on the shore line.
 - c. Salt is found in the ocean.
 - d. Salt is also found in the body systems, including the digestive system.
- 4. What is the most likely reason that the author included the information about salt?**
 - a. To tell readers how much salt should be used on their food
 - b. To explain to readers where they can find salt
 - c. To teach readers about the importance of salt
 - d. To encourage readers to put more salt on their foods
- 5. There are two places we can find salt on the earth. The type of salt that is found in solid rock is called...**
 - a. Halite.
 - b. Halitosis.
 - c. Heme.
 - d. Rockis saltis.
- 6. According to the details in the passage, what do sea turtles do to eliminate extra salt from their bodies?**
 - a. They remove the salt through their salt gills.
 - b. They remove the salt through their tears.
 - c. They remove the salt through their nose.
 - d. They leave the extra salt in their bodies.

7. People like the taste of salt, but we also need to have a certain amount of it in our bodies to keep us healthy. What is one of the roles of sodium in our bodies?

Students may mention any of the following roles salt plays in our bodies:

- Maintains the volume of fluid in the blood, cells, and tissues.
- Helps in nerve function.

Students may also mention that our bodies work to control the amount of salt taken in or let out of our bodies.

8. Animals that live in salt water need to get rid of excess salt. What is one way they do this?

Saltwater fish excrete salt in their urine and through their gills. Sea birds and reptiles like sea turtles send excess salt out of salt glands located near or in their eyes.

9. Salt makes food taste better. Name at least two other uses for salt.

Students may mention any of the following two uses for salt:

- Salt keeps the fluids balanced in human and animal bodies.
- Salt is used as a preservative to keep bacteria from growing on food and causing it to spoil.
- Salt is used in making soap, detergents, paper, dyes, cleaning agents, and antiseptics.
- Salt is used to treat icy roads.

10. What are two main sources of salt on Earth?

Salt is found dissolved in ocean water and underground as solid rock salt.

What's going on here?

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1. Explain why water is able to dissolve salt (sodium chloride).

Water molecules have a slight positive charge on one end and a slight negative charge on the other end. Salt is made up of sodium ions (Na^+) which have a strong positive charge and chloride (Cl^-) ions which have a strong negative charge. The positive end of water molecules are attracted to the negative chloride ions while the negative ends of water molecules are attracted to the positive sodium ions. These water molecules pull the ions that make up salt away from each other causing the salt to dissolve.

2. Explain why the amount of salt and kosher salt that dissolved was so similar.

Salt and kosher salt are both made of sodium chloride, so the attractions the ions have for each other is the same. Because they're made of the same ions, water molecules interact with the ions that make up salt and Kosher salt in the same way. This is why the amount of salt and Kosher salt that dissolves is so similar.

3. Why do you think the salt and kosher salt looked similar when they recrystallized but looked different from the other substances?

Salt and Kosher salt looked similar when they recrystallized because they are made of the same ions. When allowed to recrystallize under the same conditions, these crystals look alike. These looked different from the other crystals because they are made out of different ions. Also, these ions bond together in different arrangements making the crystals look different.