Name:	Class:	Date:	

Factors affecting the rate of dissolving investigation

Learner Outcomes:

 Investigate and identify factors that affect solubility and the rate of dissolving a solute in solvent.

Key Terms:

Solubility Unsaturated Solvent

Concentration Solution Saturation point

Saturated Solute

Background Information: The solubility of a substance depends upon a number of factors. By manipulating one or more of these factors, we can change the amount of solute that can dissolve in a specified amount of solvent.

Problem: How do temperature, stirring and size of particles affect the rate of dissolving of sugar?

Hypothesis:

Materials:

sugar cubes hot water rubber safety mitts powdered sugar scoopula stopwatch or timer 8-150 ml beakers 2 stir sticks hot plate or kettle cold water masking tape

Procedure:

- 1. Label the beakers #1 #8 using small pieces of masking tape.
- 2. Fill beakers #1 #4 three quarters full of cold water.
- 3. Fill beaker #5 with hot water (get the hot water from the kettle, your teacher will pour it for you)
- 4. Place 1 sugar cube in beaker #1 and 1 sugar cube in beaker #5.

 Record the time at which each was placed in the beaker. Observe at 2

This investigation / activity has been adapted from:

Mah K, Martha J, McClelland L, et al. *Science in Action 9*. Toronto, ON: Addison Wesley.

minutes intervals to see when complete dissolving has occurred. Record the time when all the sugar has dissolved for each beaker. Continue with step 5 while watching these beakers.

- 5. Repeat step #3 using beaker #6 instead of beaker #5.
- 6. Place 1 sugar cube in beaker #2 and 1 sugar cube in beaker #6.

 Record the time at which each was placed in the beaker. Have one person stir the mixtures using the stir sticks, one in each hand.

 Observe every few seconds to see when dissolving is complete.

 Record the time when all the sugar has dissolved for each beaker.
- 7. Repeat step #3 using beaker #7
- 8. Place 1 scoopula of powdered sugar into beaker #3 and 1 scoopula into beaker #7. Record the time at which each was placed in the beaker. Observe at 2 minute intervals to see when each has fully dissolved. Record the time when all the sugar has dissolved for each beaker.
- 9. Repeat step #3 using beaker #8.
- 10. Place 1 scoopula of powdered sugar into beaker #4 and 1 scoopula into beaker #8. Record the time at which each was placed in the beaker. Have one person stir the mixtures using the stir sticks, one in each hand. Observe every few seconds to see when dissolving is complete. Record the time when all the sugar has dissolved for each beaker.
- 11. Wash out all beakers and return the beakers, hot mitts, stir sticks and extra sugar to the trolley. Also ensure that your work space is tidy and dry.

Observations:

Beaker#	Time sugar was place in the beaker	Time when sugar was fully dissolved	Time Difference (calculate how long it took to
	Hour:Min:Sec	Hour:Min:Sec	dissolve the sugar)
1			
2			
3			

This investigation / activity has been adapted from: Mah K, Martha J, McClelland L, et al. *Science in Action 9*. Toronto, ON: Addison Wesley.

4							
5							
6							
7							
8							
Analysis: 1. Rank the beakers from FASTEST dissolving to SLOWEST dissolving.							
(In th	ne case of a tie, which 1 st :	should be the fastest 5 th :	r) – 1 marks				
	2 nd :	6 ^{†h} :					

2. Using the lab problem and procedure as a reference, identify the following lab variables.

7th:

8th:

a. Manipulated

3rd:

4th:

b. Responding

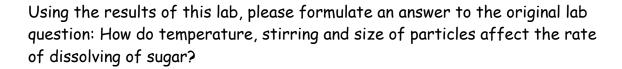
c. Controlled

3. What type of observations (qualitative or quantitative) were you recording in this lab?

This investigation / activity has been adapted from: Mah K, Martha J, McClelland L, et al. *Science in Action 9*. Toronto, ON: Addison Wesley.



Conclusion:



Research and describe at least 3 situations where we may want or need to change the solubility of a substance and explain how and why that is done.