SOLUBILITY

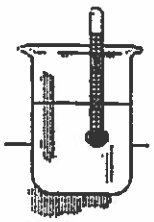
The Ability to Dissolve

LAB #

INTRODUCTION:

SOLUBILTY is the amount of a substance that can be dissolved in 100 ml of water at a certain temperature. There are 5 ways to increase the solubility of a substance:

1. Crush it
2. Stir It
3. Pressurize it
4. Heat it
5. Add a Catalyst



This activity will determine what changing the temperature of the water will have on the solubility of a substance.

PRE - LAB:

A group of students were asked to test the solubility of 3 different substances. They tested each of the 3 substances by recording how much solute could be added to 100 ml of water at a variety of temperatures. The students heated the 100 ml of water at 10°C intervals and added the substance until saturation occurred. They recorded the amount of solute that could be dissolved at that temperature on a data table. The results for each substance is below:

HYDROGEN CHLORIDE HCl

TEMP (°C)	GRAMS (g)
0	84
10	78
20	72
30	67
40	63
50	58
60	55
70	52
80	49
90	46
100	43

POTASSIUM CHLORATE KClO$_3$

TEMP (°C)	GRAMS (g)
0	6
10	7
20	9
30	12
40	16
50	21
60	28
70	36
80	45
90	52
100	60

SODIUM NITRATE NaNO$_3$

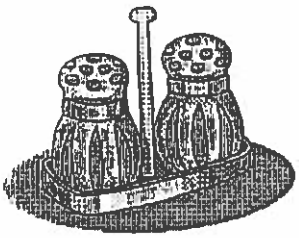
TEMP (°C)	GRAMS (g)
0	72
10	80
20	88
30	96
40	105
50	115
60	126
70	137
80	148
90	159
100	170

PROCEDURE:

Plot the data on the graph provided and analyze the results. When plotting the data, make a **separate line** for each of the 3 different compounds **and label each of the lines**.

LAB QUESTIONS

SOLUBILITY



1 Did the Temperature of the water have any effect on the solubility of the substances?

YES **NO**

2 Which substance(s) solubility INCREASED with an increase in temperature?

Sodium Nitrate ($NaNO_3$)	Potassium Chlorate ($KClO_3$)	Hydrogen Chloride (HCl)

3 Which substance(s) solubility DECREASED with an increase in temperature?

Sodium Nitrate ($NaNO_3$)	Potassium Chlorate ($KClO_3$)	Hydrogen Chloride (HCl)

INTERPRETING THE GRAPH

Answer the following using the graph that was made during the lab

SUBSTANCE		TEMPERATURE (oC)	AMOUNT OF SOLUTE (g)
Sodium Nitrate	($NaNO_3$)	35	
Sodium Nitrate	($NaNO_3$)	55	
Sodium Nitrate	($NaNO_3$)		105
Potassium Chlorate	($KClO_3$)	25	
Potassium Chlorate	($KClO_3$)	75	
Potassium Chlorate	($KClO_3$)		40
Hydrogen Chloride	(HCl)	5	
Hydrogen Chloride	(HCl)	45	
Hydrogen Chloride	(HCl)		50