**Solubility Lab Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Purpose:**

To determine the solubility of a salt at different temperatures.

**Hypothesis (written as an “if, then” statement):**

**Materials:**

salt, distilled water, tripod stand and gauze, Bunsen burner, beakers, ice, filter paper, funnel, thermometer, watch glass and stop-watch

**Method:**

1. Weigh out four equal amounts of the salt and place in four (4) separate test-tubes.
2. Measure out four 25cm3 of distilled water and place in four beakers.
3. Get the mass of the water

* First get the mass of the beaker empty (dry mass)
* Then add the 25cm3 of distilled water and get the mass again (net mass)
* Subtract the dry mass from the net mass to get the actual weight of the water, record: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Prepare the water to the following temperatures – 0°C, 30°C, 60 °C and 90°C

* For 0°C, prepare an ice bath, set the beaker in the ice bath and monitor the temperature
* For 30°C just leave the beaker on the lab table, that’s about room temperature
* For 60 °C, set the beaker on a hot plate, monitor the temperature using a thermometer. BE CAREFUL
* For 90 °C, set the beaker on a hot plate, monitor the temperature using a thermometer. BE CAREFUL

1. Once each beaker has reached the desired temperature, place the salt in each container of water and stir for 20 seconds.
2. Immediately pour the solution through a filter paper. Do this over the sink. Do not burn yourself.
3. Allow the residue to dry and reweigh.
4. Organize results, do calculations.

**Data:**

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| --- | --- |
| **Temperature of Water** | **Mass After Filtering** |
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**Calculations:**

To calculate the solubility of each salt at the different temperature, you will need to use the formula:

mass of salt (g) = x 🡪 solve for x 🡪 x = mass of salt (g) X 100 g water

mass of water (g) 100 g water mass of water (g)

\*note:

* Mass of salt: get this from weighing your filter paper once dry
* 100 g of water (remember that solubility is how many grams of solute will dissolve in every 100 grams of water)
* Mass of water: get this from the actual weight calculated in step 3

Solubility at 0°C:

Solubility at 30°C:

Solubility at 60°C:

Solubility at 90°C:

**Graph:**

When creating a solubility curve, the solubility should be on the y-axis and the temperature should be on the x-axis. You just calculated the solubility at each temperature in the previous step. Use those as your y-intercepts and the temperatures as your x-intercepts. Your curve should have 4 points on it. Plot each point and connect them with one solid line.

Solubility of NaCl

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60

90

0

30

Temperature (°C)

**Conclusion:**

1. What effect did the temperature have on the solubility of table salt in distilled water?
2. Did you reject or fail to reject your hypothesis? Why or why not? **Explain.**
3. List 3 variables that were held constant:
4. List the variable that was changed:
5. Compare the solubility curve you created above to an actual solubility curve for NaCl. Are they similar? Different? Why? **Explain.**
6. What are some factors that may cause errors in this experiment?