

Identification of an Unknown salt from its solubility Curve

Purpose: To test Solubility of the element with changing temperatures and volumes in the water which is polar ions (Negatively charge and Positive charges)

Procedures: 1.get the unknown salt from the professor and measure it without a cap on. Both with the container, empty bottom, calculating the substance by subtracting those.

2.get a beaker and put water in 300 ml as a bathtub for a test tube. For the test, starting add 3mL of water in it till it dissolves at the first time. Then watch the temperature which makes the particle become crystal again in the solution.

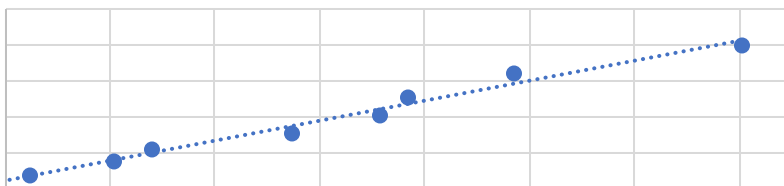
3. Then 0.5-1.mL to dilute and keeping boiling still till completely dissolve in the water. Then let it cool down and watch the temperature then repeat up to 8-9 times

Data: 20R

Mass of substance and bottle	7.8744b g
Mass of Empty bottom	2.8462 g
Mass of substance	5.0282 g

Temperature Vs. solubility(g/100mlH₂O)

Temperature (Celsius)	Solubility	Volume(ml)
75.3 C°	45.22 g/100ml	11.12 mL
53.4 C°	41.21 g/100ml	12.20 mL
43.4 C°	37.94 g/100ml	13.25 mL
40.7 C°	35.38 g/100ml	14.21 mL
32.4 C°	32.76 g/100ml	15.35 mL
19.0 C°	30.66 g/100ml	16.40 mL
15.3 C°	28.98 g/100ml	17.35 mL
7.3 C°	27.18 g/100ml	18.50 mL
2.30 C°	25.45 g/100ml	19.75 mL



Conclusion: The mass of the reactant stay the same but the volume which dilute concentration of the particle. The more you add the lower temperature you will get and also the solubility is directly proportional to Temperature. But it is inverse proportional to the volumes which add to dissolve in the water. It is hard to dissolve KCl because solubility of these is less than other substance. And it needs more water to make an ion solution when you dissolving it

Post Lab Questions

1. The temperature that we can find from the graph formula we get by plugging the values of the temperature at the point to the equation.

So we will get like

Temperature (Celsius)	Solubility
80 C°	47.19 g/100ml
70 C°	44.40 g/100ml
60 C°	41.62 g/100ml
50 C°	38.84 g/100ml
40 C°	36.06 g/100ml
30 C°	33.27 g/100ml
20 C°	30.491 g/100ml
10 C°	27.11 g/100ml

2. the solubility of KNO₃ is about 138-140 g/100 ml

It is approximately 117 gram-119 gram of KNO₃ dissolve in solutions

$$X/85\text{ml} \times 100 = 140 \rightarrow X = 117 \text{ g.} - 119 \text{ g.}$$

3. By the measurement that we can get inaccurate value of number g dissolve in water will be change the solubility because the solution will be significant large to solution you would get. Because it depends on how many gram that you have diluted. The slop will be shift up down to axis because of less mass in the process.

4.

a. The concentration of those thing will become really high and water is in vapor, so the mL of water is not the number we got from the initial point, So it would be inaccurate.

b. Depend on how much water is evaporated to air or out of the container. If it is significantly less, it will not cause any thing, if it is larger amount, it would have some changed