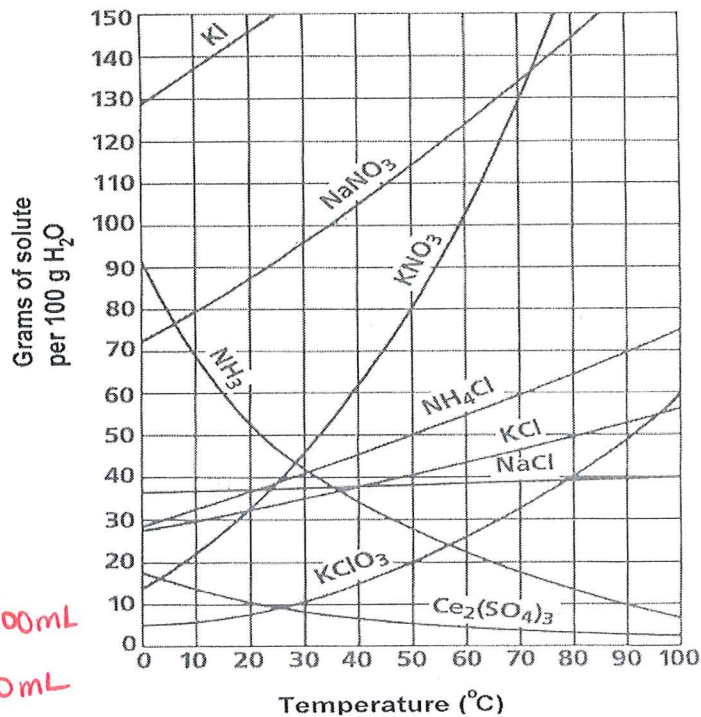


Solubility Worksheet

Honors Chemistry

1. Find the mass of solute that will dissolve in 100-mL of water at the following temperatures.

- a) KNO_3 at 70°C = 130 g
 b) NaCl at 100°C = 40 g
 c) NH_4Cl at 90°C = 70 g
 d) Which of the **above** three substances is most soluble in water at 15°C . = NaCl



2. Determine the solubility of the following substances:

- a) What is the solubility of KCl at 5°C ? 28 g/100 mL
 b) What is the solubility of KCl at 25°C ? 34 g/100 mL
 c) What is the solubility of $\text{Ce}_2(\text{SO}_4)_3$ at 10°C ? 13.5 g/100 mL
 d) What is the solubility of $\text{Ce}_2(\text{SO}_4)_3$ at 50°C ? 5 g/100 mL

3. Solution	Unsaturated or Saturated? Explain	If unsaturated, how much more solute can dissolve in the solution?
a solution that contains 70g of NaNO_3 at 30°C (in 100 mL H_2O)	unsaturated	26 more grams
a solution that contains 50g of NH_4Cl at 50°C (in 100 mL H_2O)	saturated	X
a solution that contains 20g of KClO_3 at 50°C (in 50 mL H_2O)	saturated	X
a solution that contains 70g of KI at 0°C (in 200 mL H_2O)	unsaturated	190 more grams

4. At 90°C , you dissolved 10 g of KCl in 100. g of water. Is this solution saturated or unsaturated? unsaturated

5. A mass of 100 g of NaNO_3 is dissolved in 100 g of water at 80°C .

- a) Is the solution saturated or unsaturated? unsaturated
 b) As the solution is cooled, at what temperature should solid first appear in the solution? Explain.

35°C , Solubility decreases as temperature decreases, when saturation occurs

6. Use the graph to answer the following two questions:

Which compound is most soluble at 20°C ? KI Which is the least soluble at 40°C ? $\text{Ce}_2(\text{SO}_4)_3$

7. Which substance on the graph is least soluble at 10°C? KClO₃

8. A mass of 80 g of KNO₃ is dissolved in 100 g of water at 50 °C. The solution is heated to 70°C. How many more grams of potassium nitrate must be added to make the solution saturated? Explain your reasoning

48 g more, Solubility increases with temperature, add enough to meet saturation

Part 2 Graphing Questions

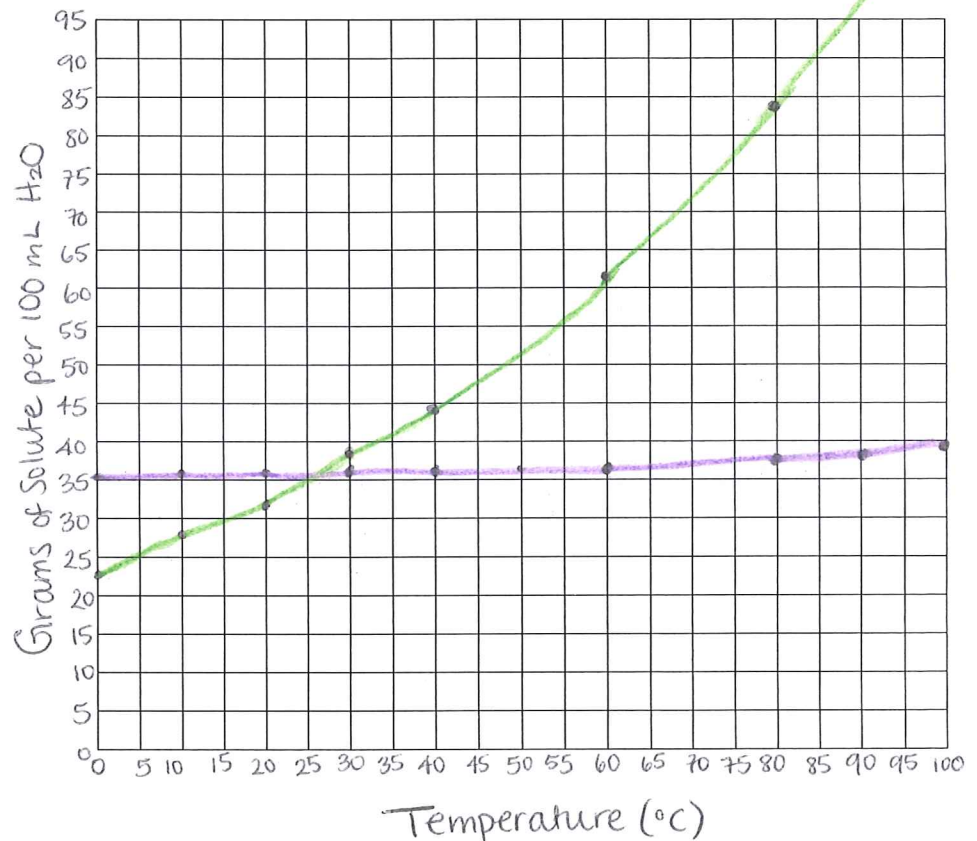
Graph the following tables of data:

- Be neat and organized (use a ruler)
- X and Y axis must have proper scale
- Have properly labeled axes
- Use a different color for the two different solubility curves.

Key:
NaCl
CuSO₄

Sodium Chloride Solubility	
Temperature °C	Solubility (g of solute/100-mL H ₂ O)
0	35.7
10	35.8
20	35.9
30	36
40	36.4
60	37.1
80	38
90	38.5
100	39.2

Copper Sulfate Solubility	
Temperature °C	Solubility (g of solute/100-mL H ₂ O)
0	23
10	27.5
20	32
30	38
40	44.5
60	62
80	84
100	114



At 80 °C, a solution has 38-grams of sodium chloride dissolved in 100-mL of water and another solution has 38-grams of copper sulfate dissolved in 100-mL of water.

1. Which solution is saturated? NaCl

2. Which solution is unsaturated? CuSO₄

3. How much more solute could you add to the unsaturated solution? 46 g