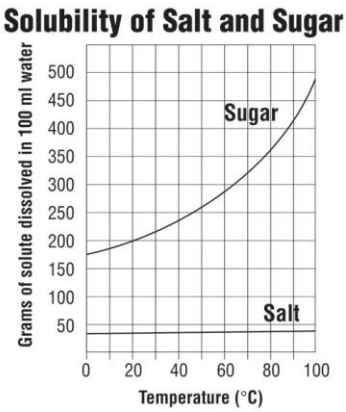
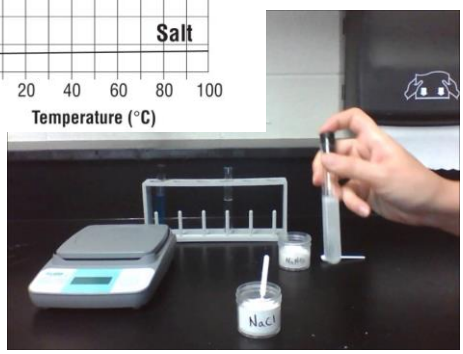
Solubility Curve Notes

A. Solubility Curves

- Solubility curves are made by determining the mass of solute that will dissolve in 100 grams of water at several temperatures.
- The data is then plotted on the graph.
- Each substance has a different line on the same graph.

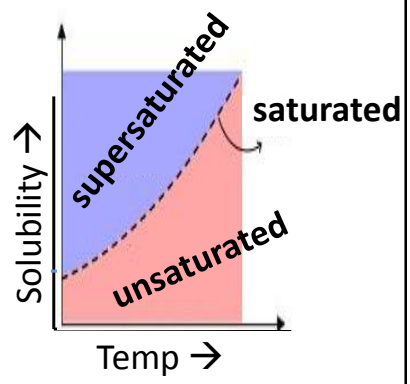




A. Solubility Curves

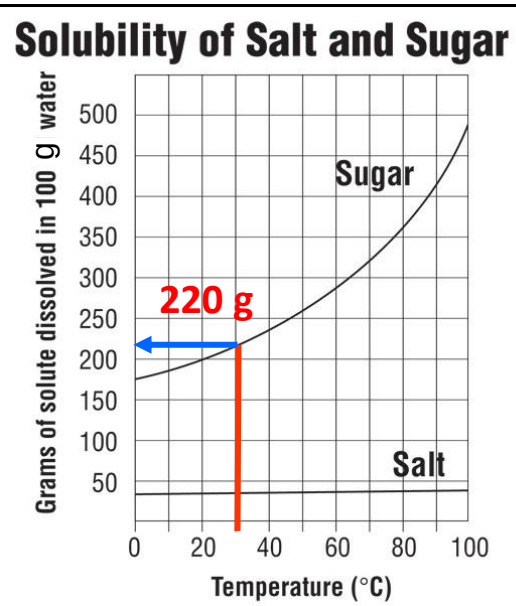
- We use solubility curves and the plot of new data to determine if the solution is…

1. Saturated= the plot will be _____on_____ the line
2. Unsaturated = the plot will be _____below_____ the line
3. Supersaturated = the plot will be _____above_____ the line



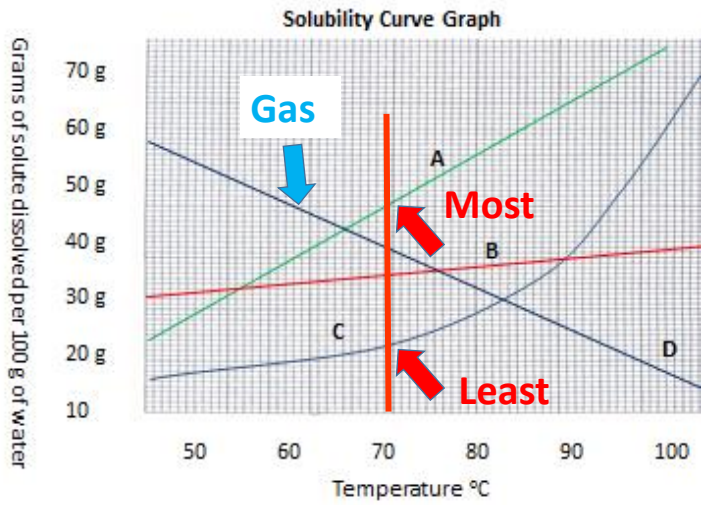
A. Solubility Curves

4. Or to determine the mass of substance that can dissolve in 100 g of water at a certain temperature



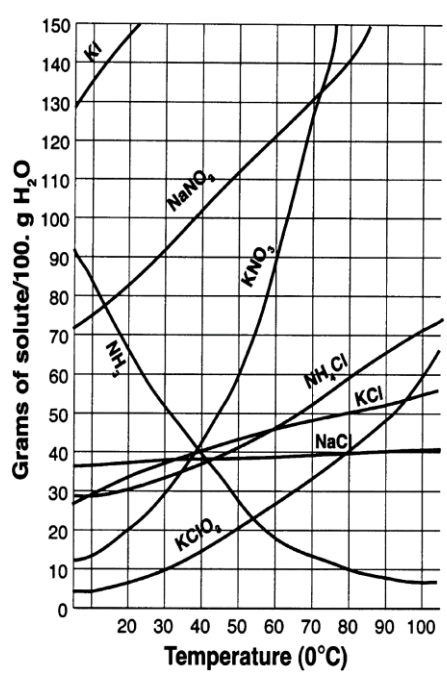
A. Solubility Curves

5. Or to determine the least or most soluble substances
6. Recall that __gases__ are more soluble at __low__ temperatures. This means that the graph should slope down for a gas.



B. How to use a Solubility Curves

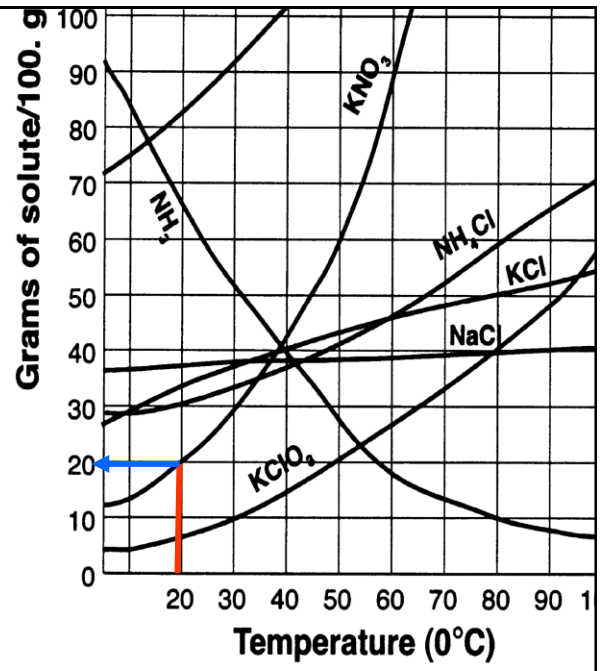
Use the solubility curve on the worksheet to answer the following questions



B. How to use a Solubility Curves

1. At 20°C, how many grams of potassium nitrate can be dissolved in 100 g of water?

20 g KNO_3



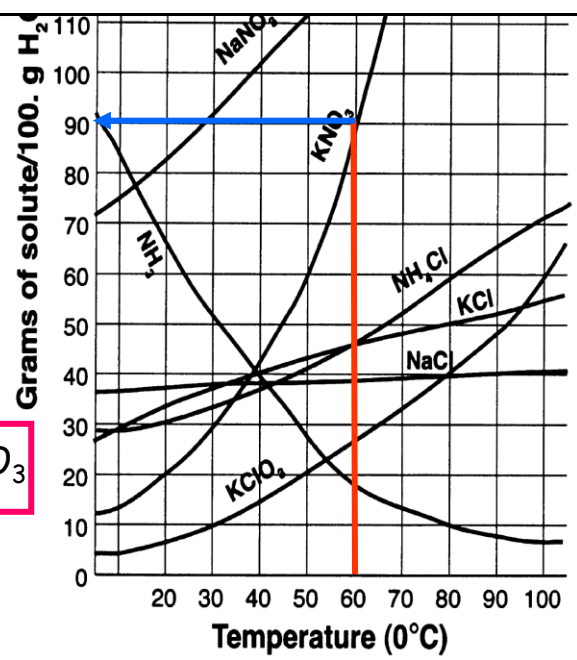
B. How to use a Solubility Curves

2. At 60°C, how many grams of potassium nitrate can be dissolved in 200 g of water?

$$\frac{90\ g\ KNO_3}{100\ g\ H_2O} = \frac{X}{200\ g}$$

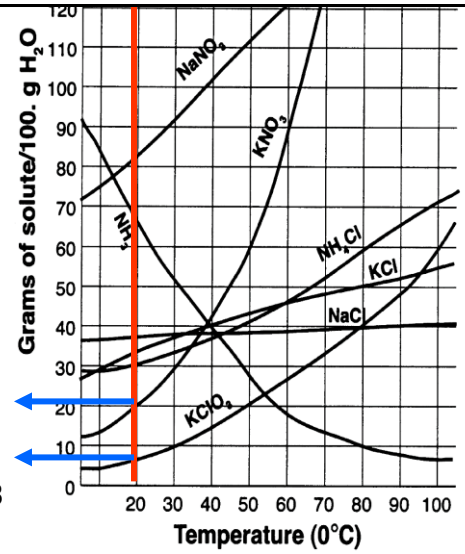
$$\frac{\cancel{100}\ X}{\cancel{100}} = \frac{200 \times 90}{100}$$

$$X = \boxed{180\ g\ KNO_3}$$



B. Solubility Curves

3. Which substance is the least soluble at 20°C? $KClO_3$



20 g KNO_3

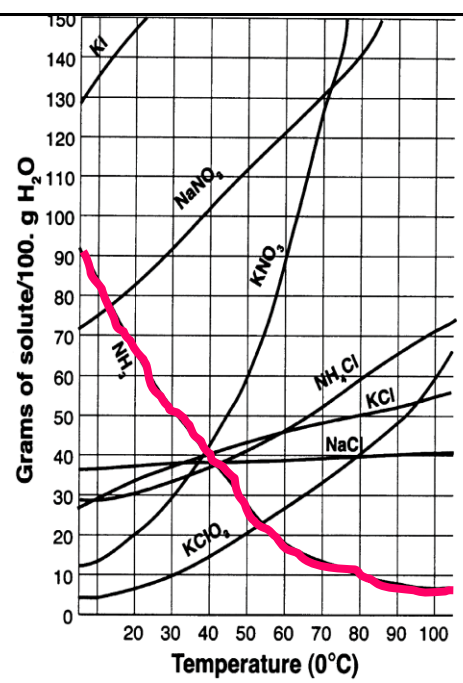
8 g $KClO_3$

B. How to use Solubility Curves

4. Which compound is likely to be a gas? Why?

NH_3

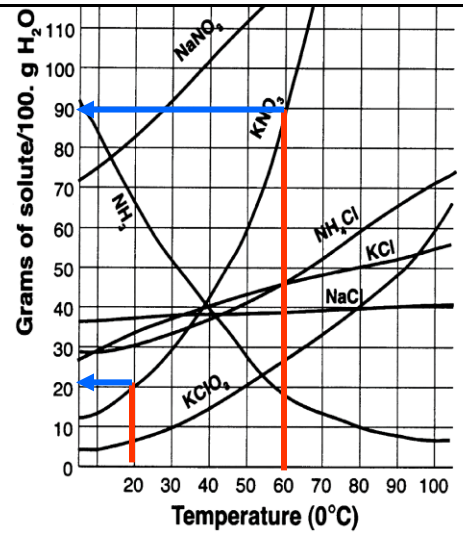
The solubility is decreasing as the temperature is increasing



B. How to use a Solubility Curves

5. A saturated solution of KNO_3 is formed from 100 grams of water. If the saturated solution is cooled from 60°C to 20°C, how many grams of precipitate are formed?

90 g KNO_3 @ 60°C
- 20 g KNO_3 @ 20°C
70 g KNO_3 lost (ppt)



B. How to Use Solubility Curves

6. 90g KNO_3 are added to 100 g H_2O, is this solution saturated, unsaturated, or supersaturated at 40°C?

supersaturated
(above KNO_3 line)