

The background features a light gray gradient with several realistic water droplets of various sizes scattered across the frame. In the center, there are faint, concentric ripples, suggesting a stone dropped into water. The overall aesthetic is clean and scientific.

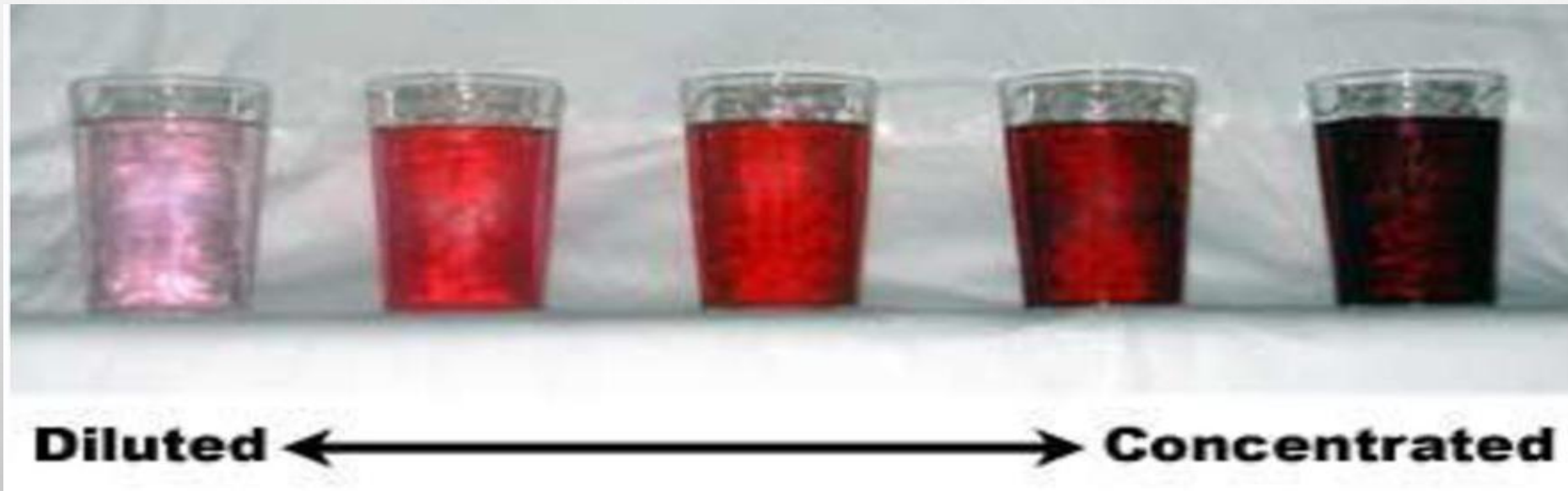
# **SOLUTIONS AND SOLUBILITY**

## A SOLUTION IS A MIXTURE OF TWO SUBSTANCES:

- A **SOLUTE** IS THE SUBSTANCE THAT DISSOLVES TO MAKE A SOLUTION.
- IN SALT SOLUTION, SALT IS THE SOLUTE.
- A **SOLVENT** IS THE SUBSTANCE THAT DOES THE DISSOLVING – IT DISSOLVES THE SOLUTE.
- IN SALT SOLUTION, WATER IS THE SOLVENT.

**Solutes and solvents may be of any form of matter: solid, liquid or gas.**

THE **CONCENTRATION** OF A SOLUTION IS A MEASURE OF THE NUMBER OF SOLUTE PARTICLES IN A VOLUME OF SOLUTION



<https://www.youtube.com/watch?v=VzhHK-0o3X8>

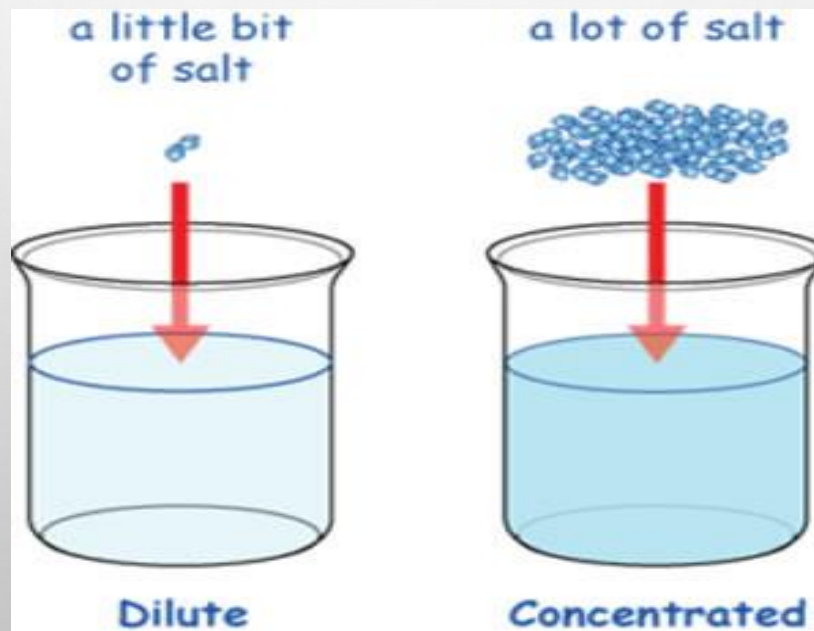
# SOLUTIONS AND CONCENTRATION

## DILUTED SOLUTION

- A DILUTED SOLUTION IS WHEN THE AMOUNT OF SOLUTE IN THE SOLVENT IS VERY LOW.

## CONCENTRATED SOLUTION

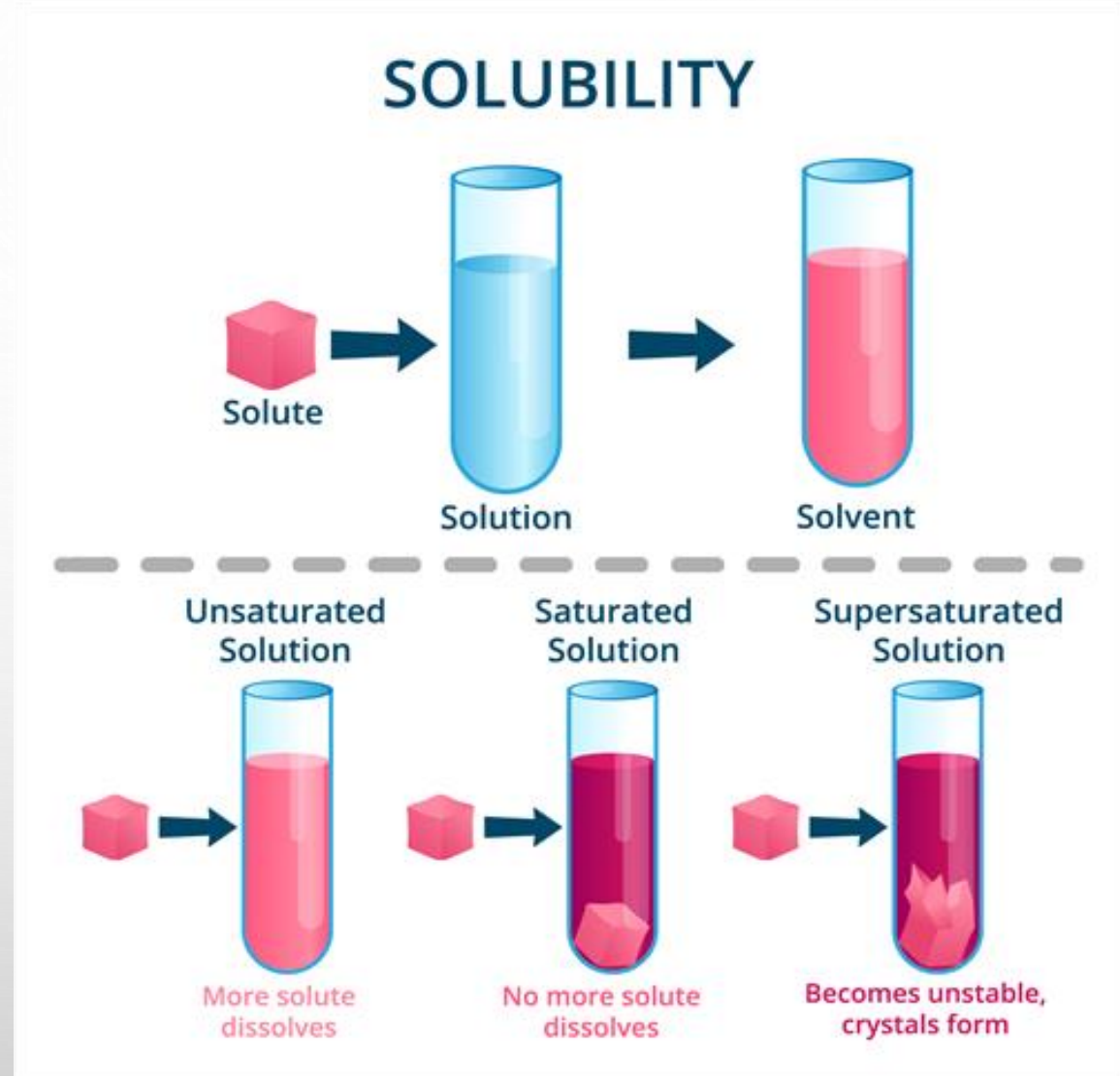
- A CONCENTRATED SOLUTION IS THE ONE THAT HAS A LARGE AMOUNT OF DISSOLVED SOLUTE.



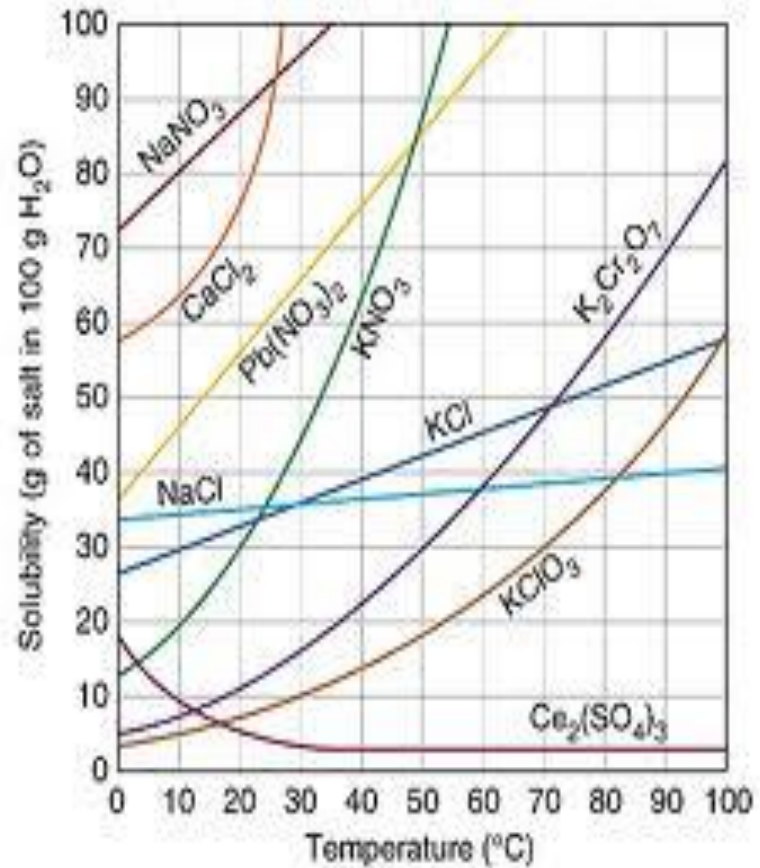
# SOLUBILITY

IS A MEASUREMENT OF HOW MUCH OF A SUBSTANCE WILL DISSOLVE IN A GIVEN VOLUME OF A LIQUID AT A SPECIFIC TEMPERATURE.

<https://www.youtube.com/watch?v=DwiNAMAuJ0k>





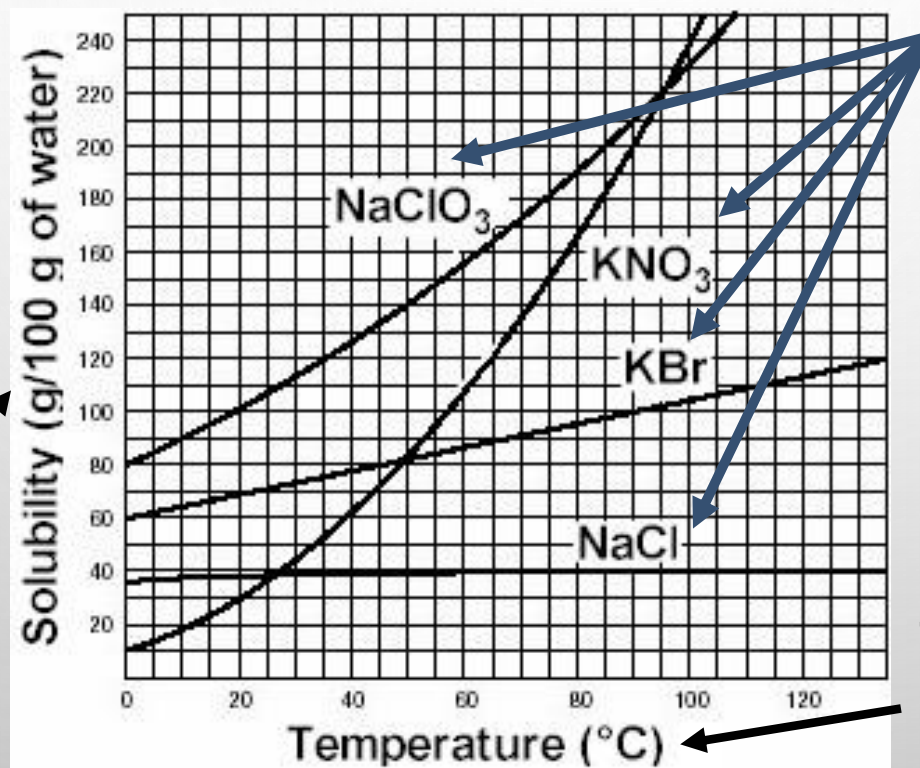


# SOLUBILITY CURVES

HOW TO INTERPRET A GRAPHICAL REPRESENTATION OF SOLUTE IN SOLVENT.

# SOLUBILITY CURVE

- **SOLUBILITY CURVE** – A GRAPHICAL REPRESENTATION OF THE AMOUNT OF SUBSTANCE THAT CAN DISSOLVE INTO 100 G OF WATER AT A SPECIFIC TEMPERATURE (CELSIUS)



## Substances:

Compound being dissolved in water (H<sub>2</sub>O)

## Y-axis:

Solubility of substance (g/100 g H<sub>2</sub>O)

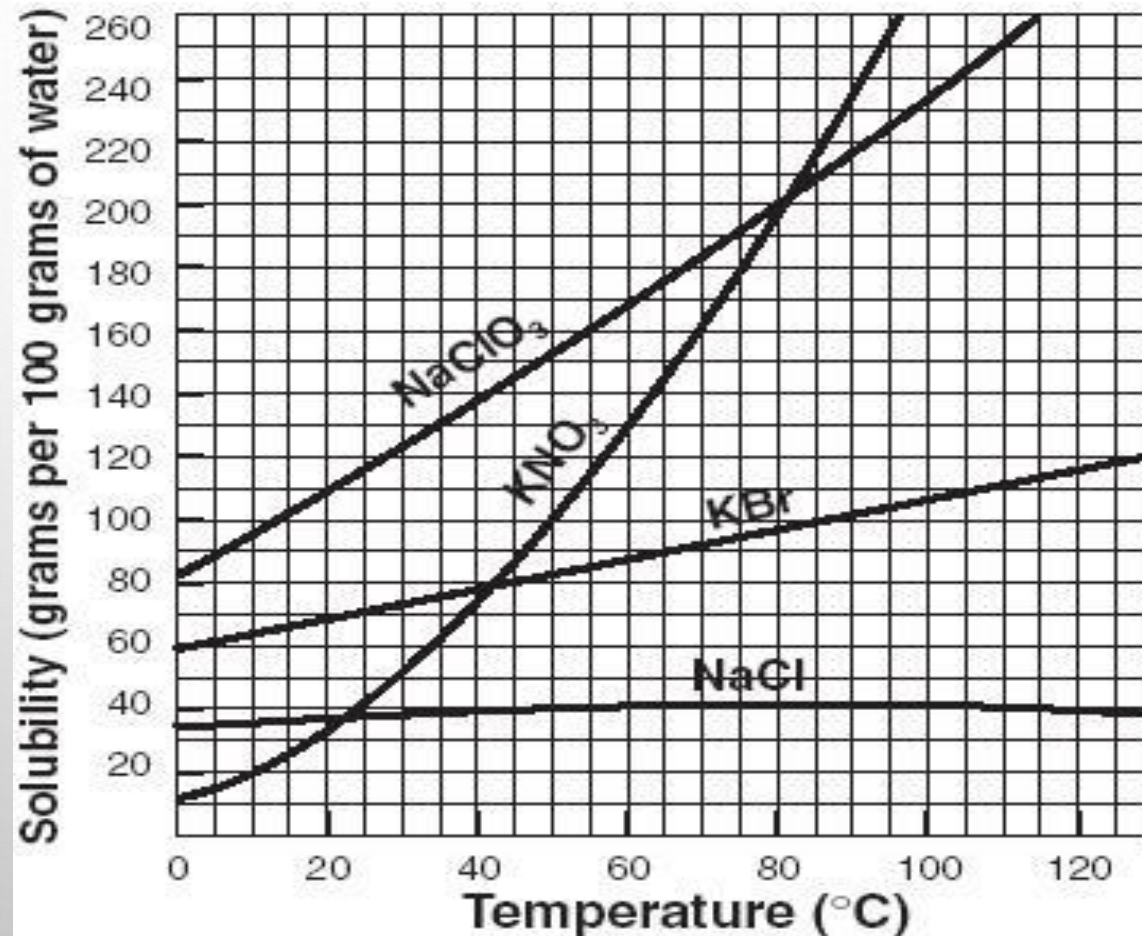
## X-axis:

Temperature (Celsius)

# INTERPRETING A SOLUBILITY CURVE

- EACH POINT ON THE SOLUBILITY CURVE SHOWS HOW MANY GRAMS CAN BE DISSOLVED AT A SPECIFIC TEMPERATURE:

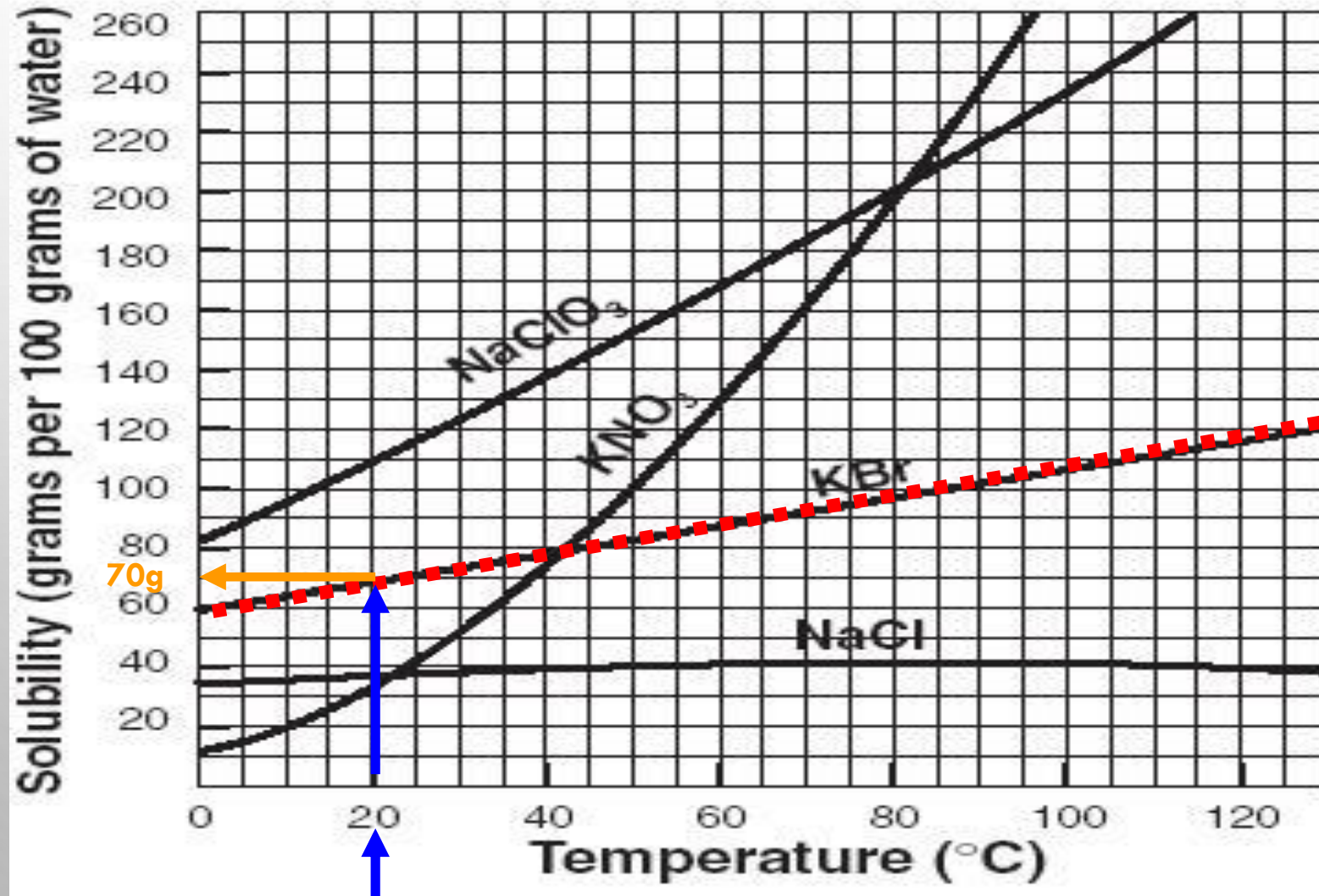
Each line shows how much substance can dissolve as a **function** of the temperature of the solution.





# USING A SOLUBILITY CURVE

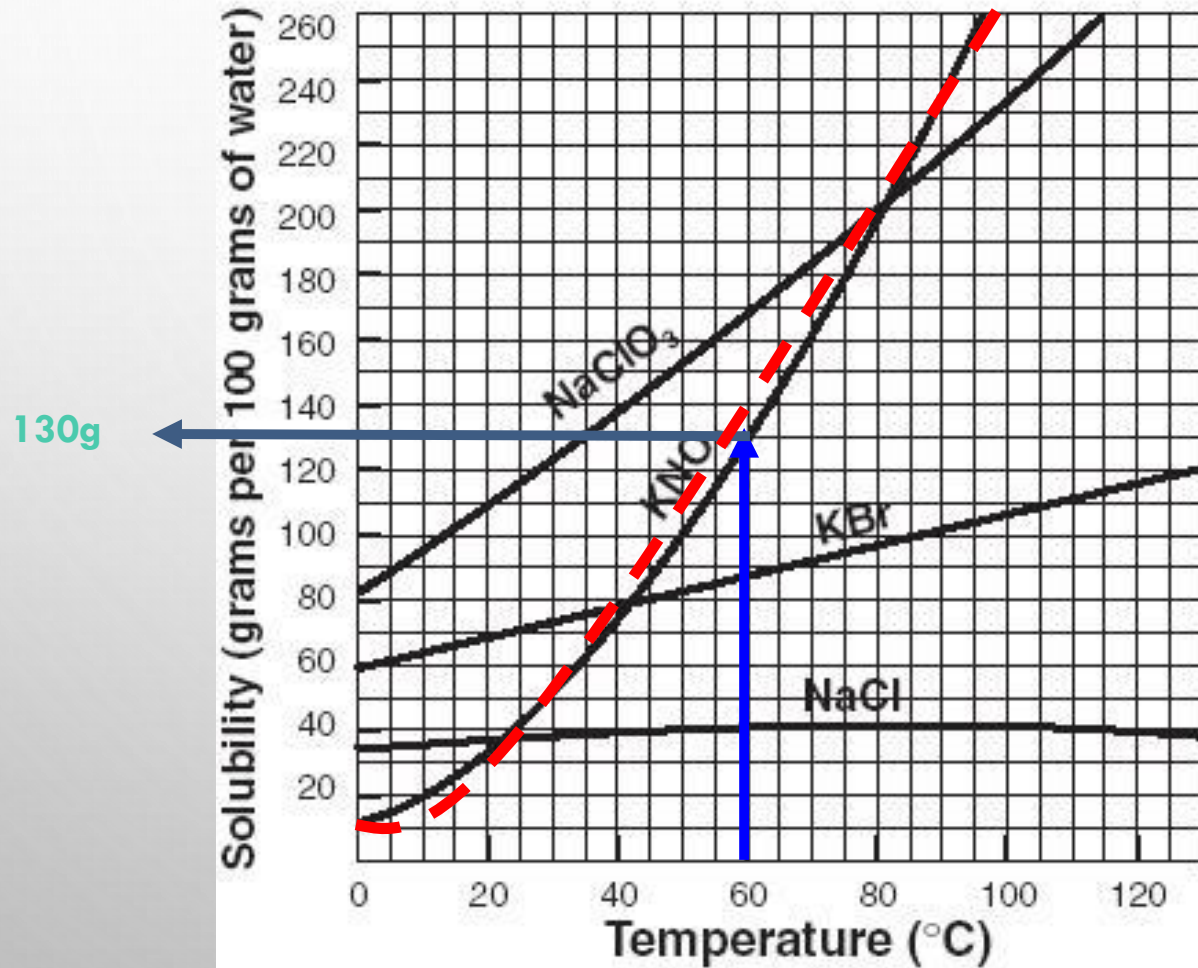
How many grams of potassium bromide (KBr) can dissolve in 100 grams of water at 20°C?



**Answer:** 70 grams of KBr can dissolve in 100g of water at 20°C

# PRACTICE USING SOLUBILITY CURVE

How many grams of potassium nitrate ( $\text{KNO}_3$ ) can dissolve in 100 g of water at  $60^\circ\text{C}$ ?

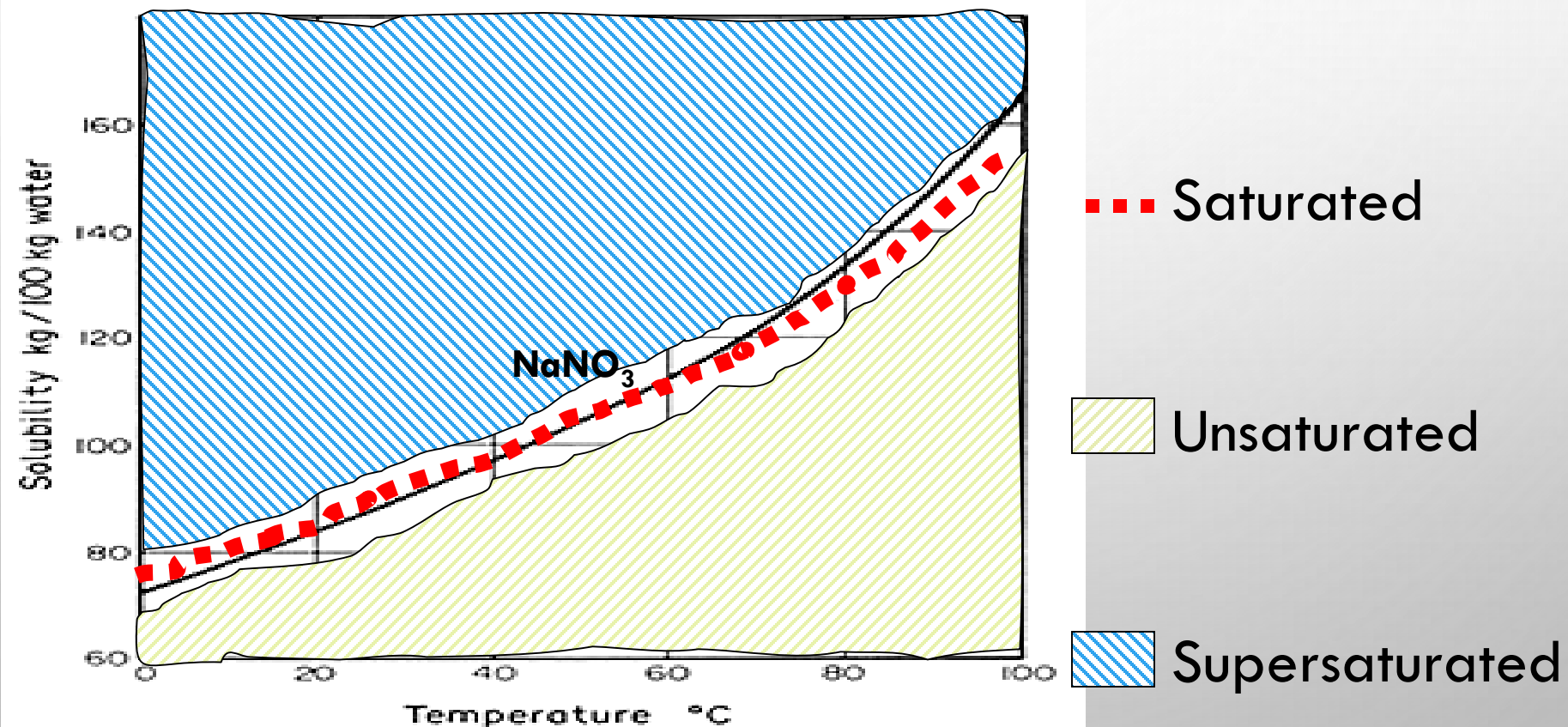


**Answer:** 130 g of  $\text{KNO}_3$  can dissolve in 100 g of  $\text{H}_2\text{O}$

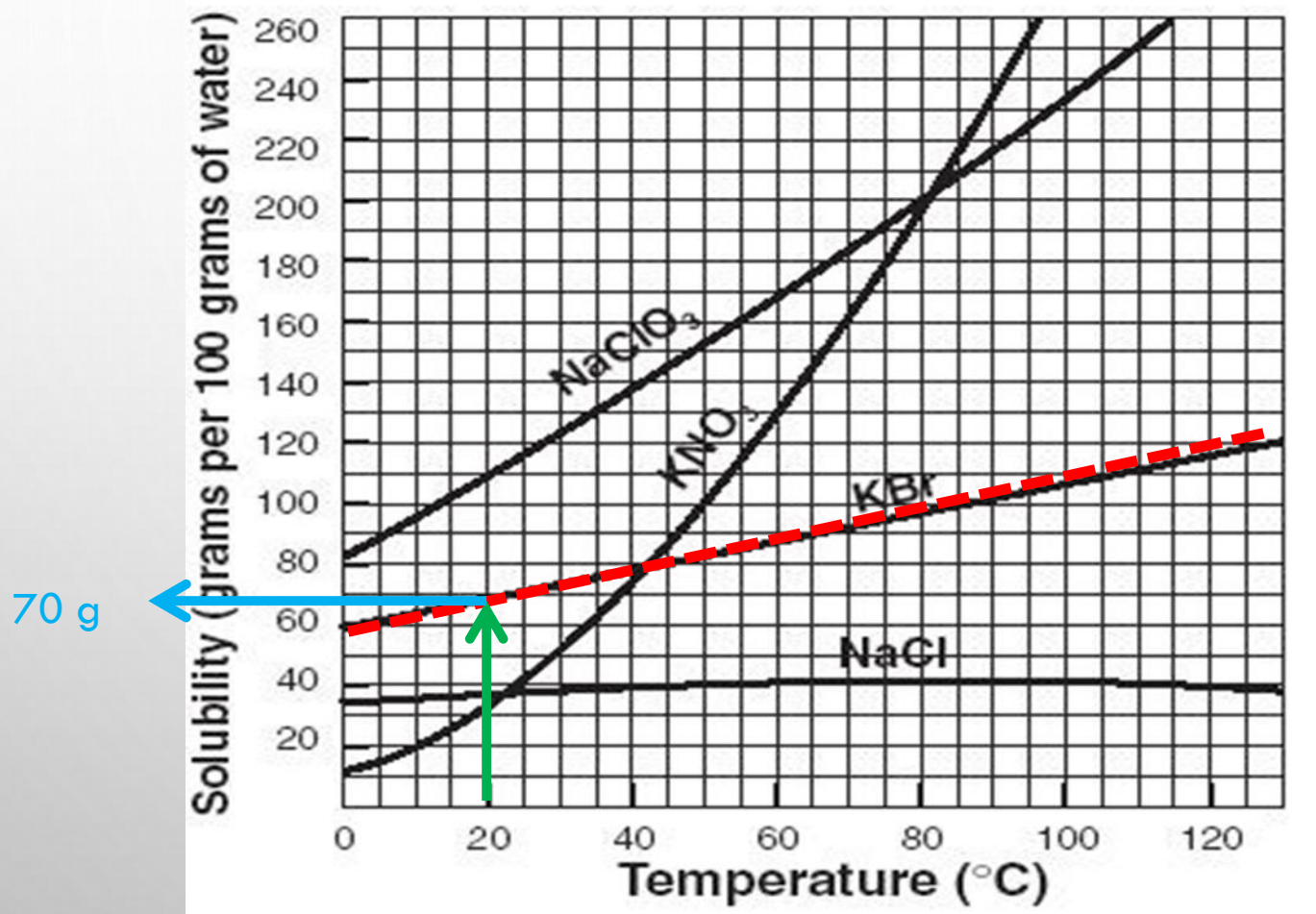
# SATURATED / UNSATURATED / SUPERSATURATED

**REVIEW:** HOW WE NUMERICALLY DESCRIBE SATURATION

- SATURATED: SOLUTE = SOLUBILITY
- UNSATURATED: SOLUTE < SOLUBILITY
- SUPERSATURATED: SOLUTE > SOLUBILITY



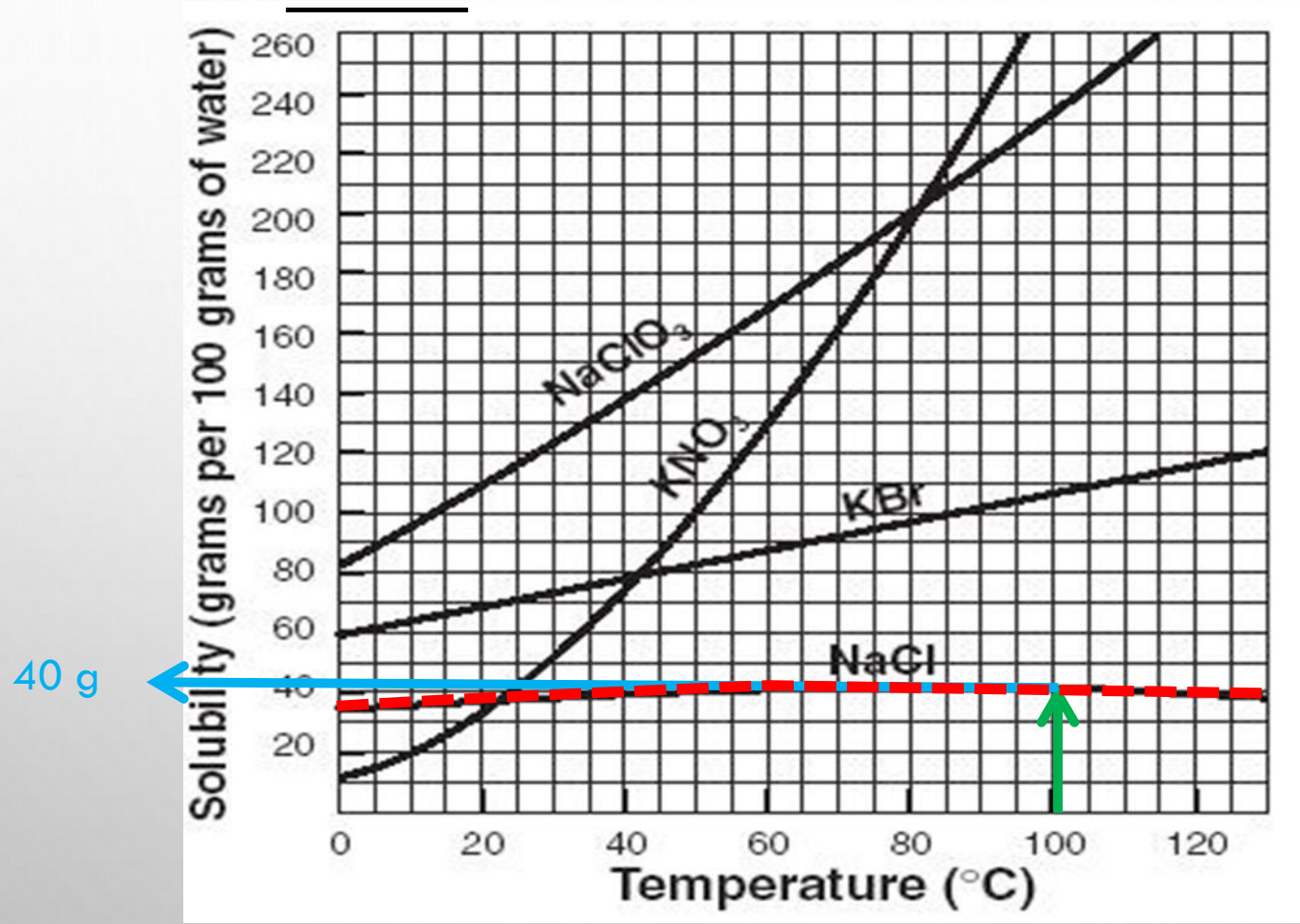
Practice #1: How many grams of potassium bromide (KBr) can dissolve in 100 g of water at 20°C?



Answer: 70 grams of Potassium Bromide can be dissolved in 100 grams of water at 20° C.

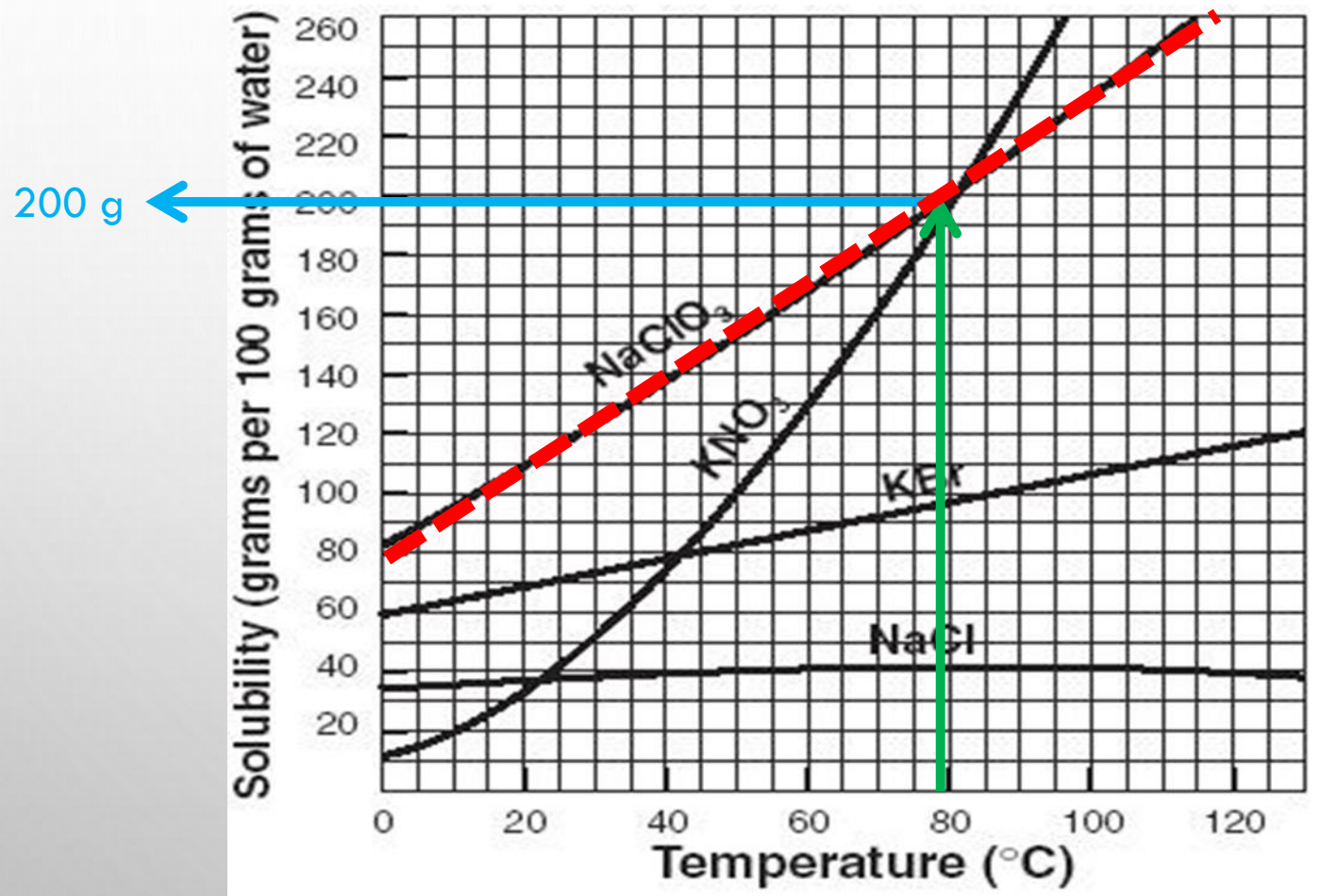


Practice #2: How many grams of sodium chloride (NaCl) can dissolve in 100 g of water at 100°C?



Answer: 40 grams of Sodium chloride can be dissolved in 100 g of water at 100°C

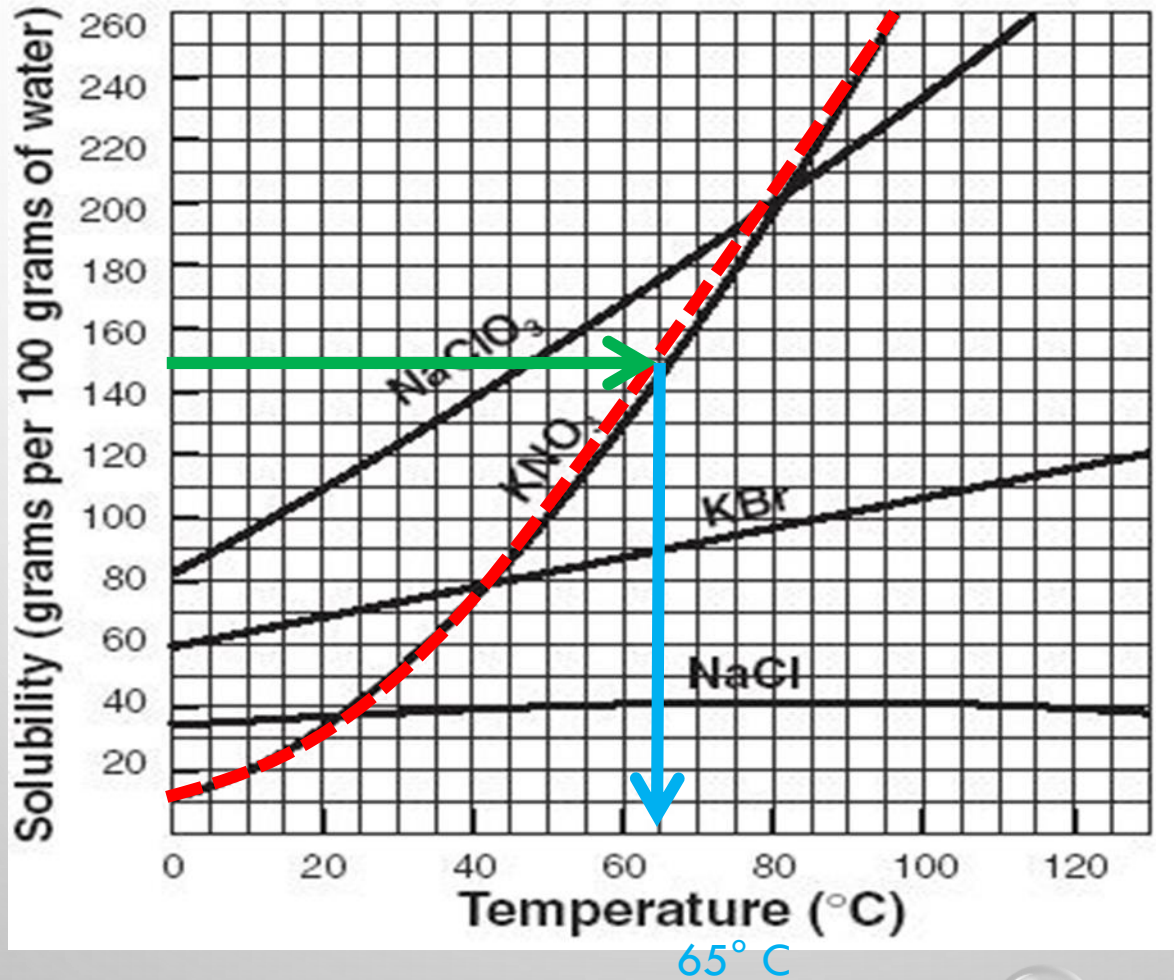
Practice #3: How many grams of sodium chlorate ( $\text{NaClO}_3$ ) can dissolve in 200 g of water at  $80^\circ\text{C}$ ? \_\_\_\_\_



200g per 100 g of water, so in 200 g of water we will have to double it:

$200 \times 2 = 400$  g  $\text{NaClO}_3$  can be dissolved in 200 g of water at  $80^\circ\text{C}$

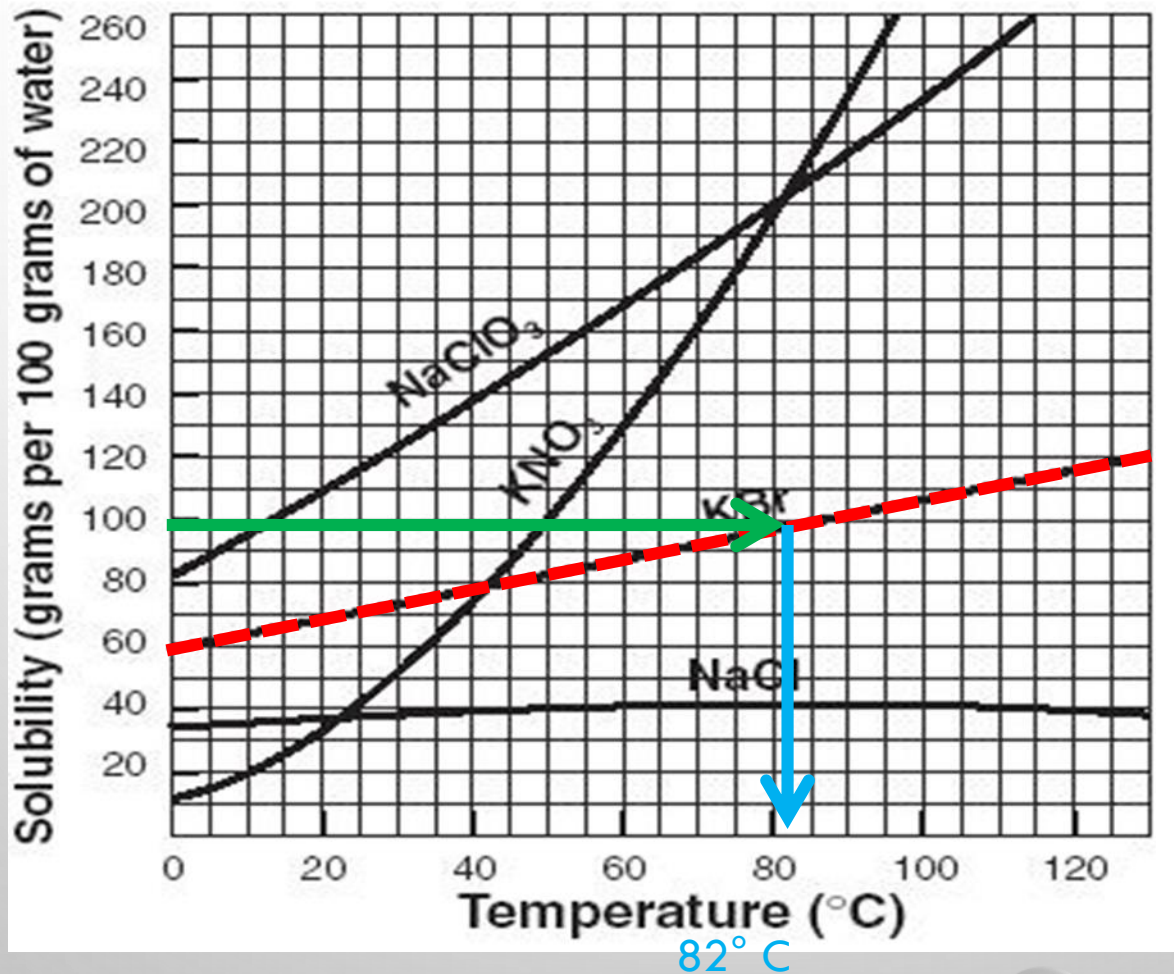
Practice #4: At what temperature can 150 grams of potassium nitrate ( $\text{KNO}_3$ ) dissolve in 100 g of water? \_\_\_\_\_



Answer: 150 grams of Potassium nitrate can be dissolved in 100 g of water at 65°C



Practice #5: At what temperature can 100 grams of potassium bromide (KBr) dissolve in 100 g of water?



Answer: 100 g of potassium bromide can dissolve in 100 g of water at 82°C