

Interpreting Solubility Curves

: Water and Its Solutions

What are solubility curves?

How much solid (solute) can dissolve in a liquid (solvent)?

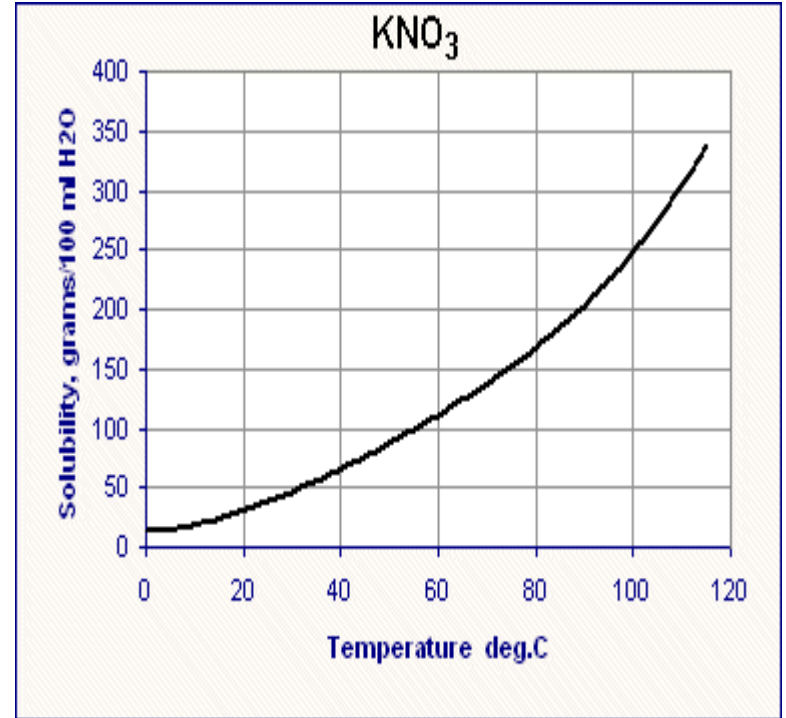
Changing the temperature changes the amount of solid solute that can be dissolved.

Expressed as

Grams of solute/100 grams of solvent

What are solubility curves?

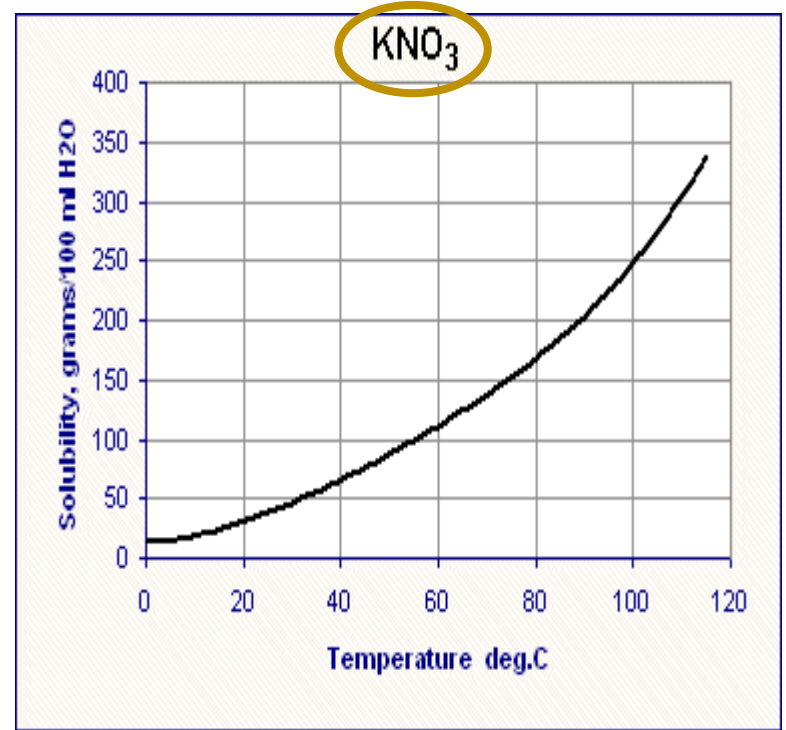
Solubility curves show the amount of solute that can dissolve in 100g (mL) of water at different temperatures.



Solubility curves

How many grams of potassium nitrate can be dissolved in 100 mL of water if the water is at 20°C?

Identify the answer from the chart on the right.



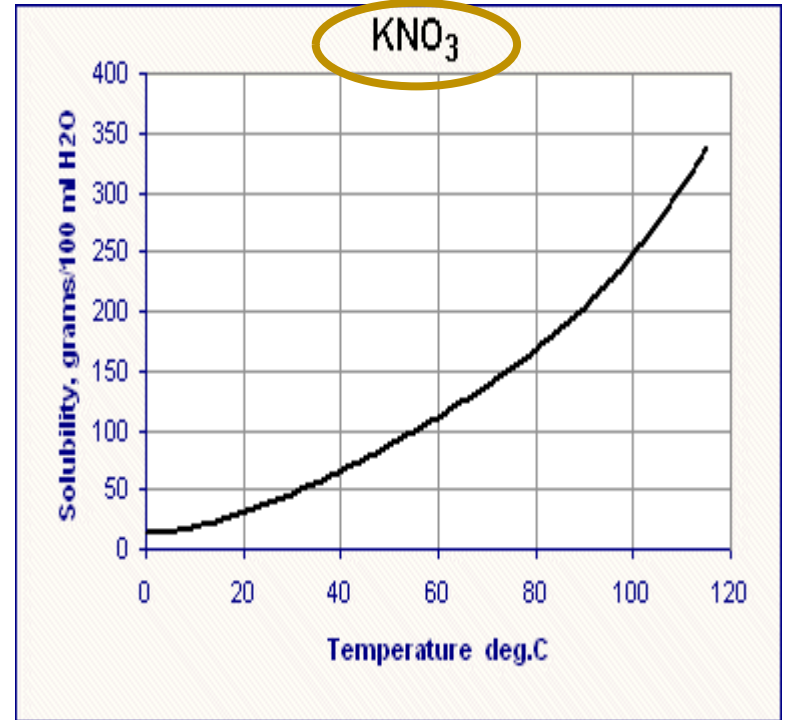
Interpreting solubility curves

How many grams of potassium nitrate can be dissolved in 100 mL of water if the water is at 20°C?

Was your answer between

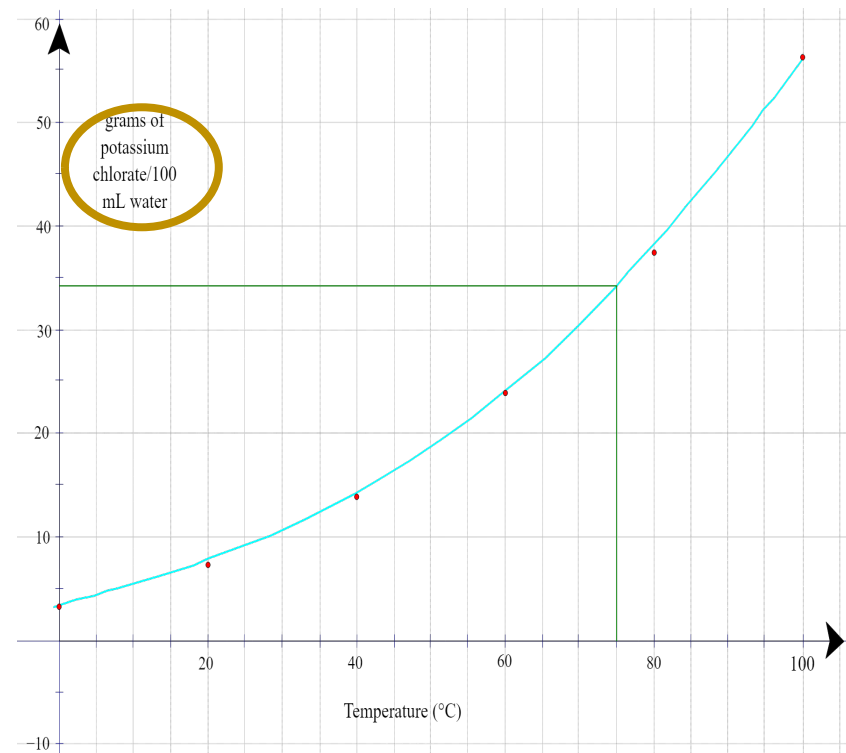
25 and 45 grams?

Good



Interpreting a solubility curve

How many grams of potassium chlorate can be dissolved in 100 mL of water if the water is at 40°C?



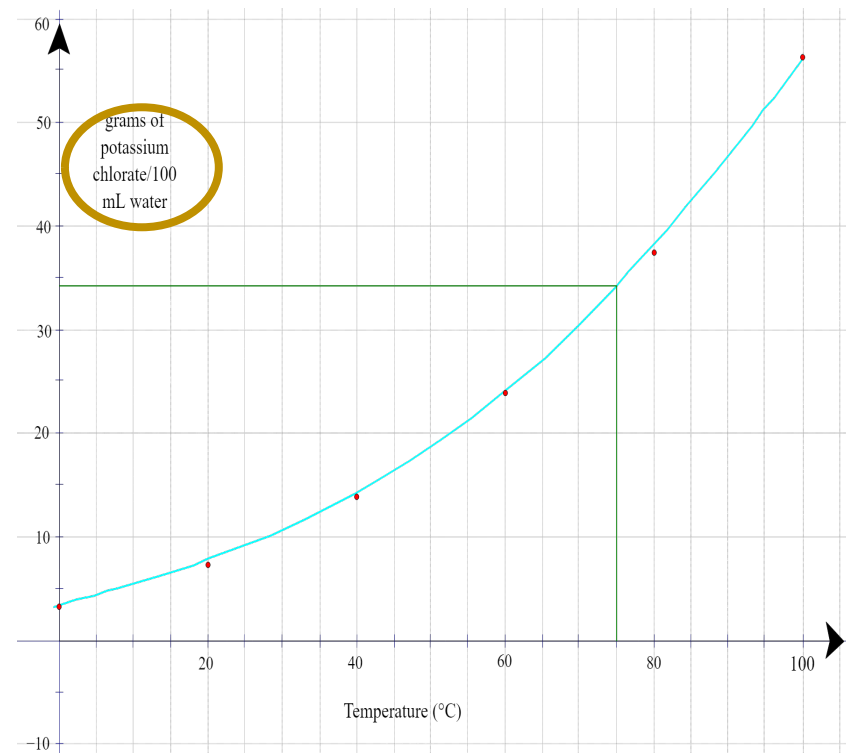
Interpreting a solubility curve

How many grams of potassium chlorate can be dissolved in 100 mL of water if the water is at 40°C?

Was your answer between

13 and 16 grams?

Good

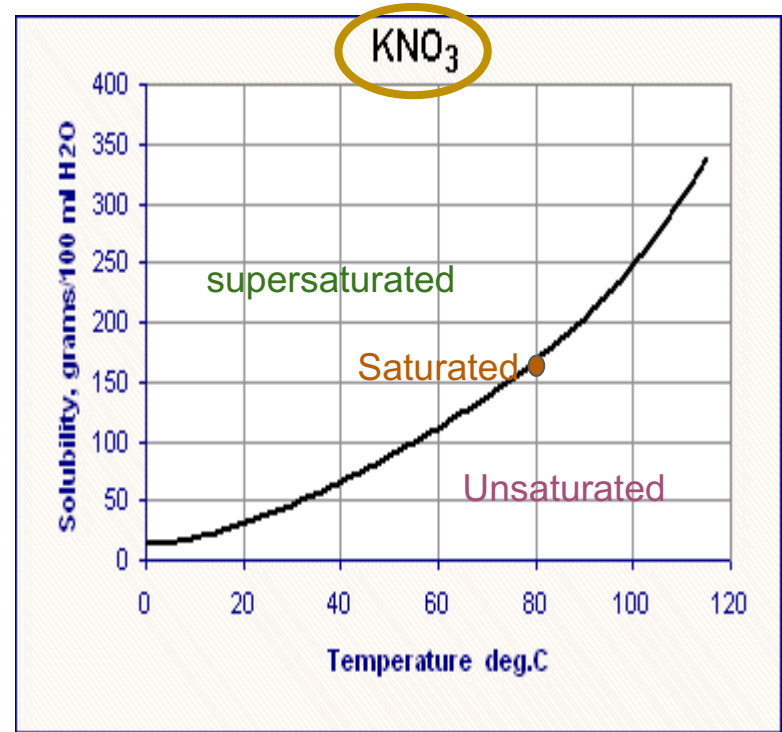


Solubility curves

Points ON the curve show saturated solutions.

Points ABOVE the curve show supersaturated solutions. (unstable)

Points Below the curve show unsaturated solutions.



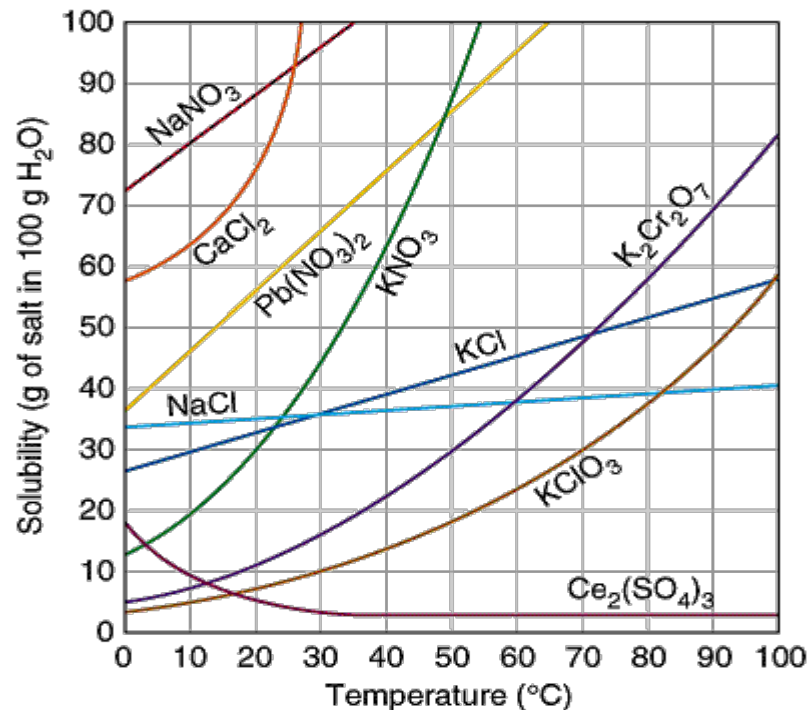
Solubility Curves

Most Charts include curves for more than one solute.

The chart on the right contains the data for 9 solutes.

When using the chart be sure to identify the correct line for the specific solute.

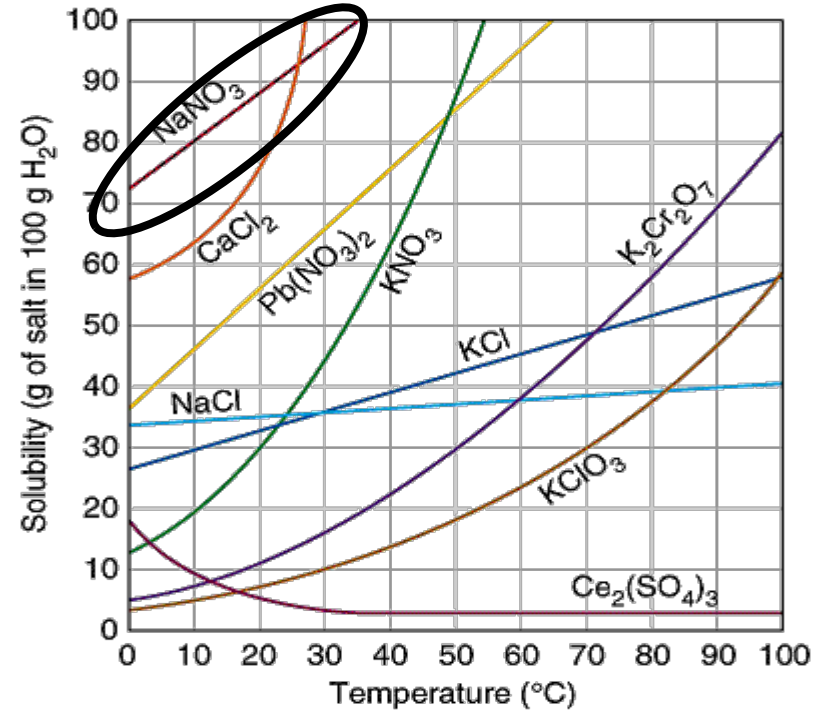
- Find the solubility curve for sodium nitrate.
- How many grams of sodium nitrate can be dissolved in 100 grams of water at 10.°C?



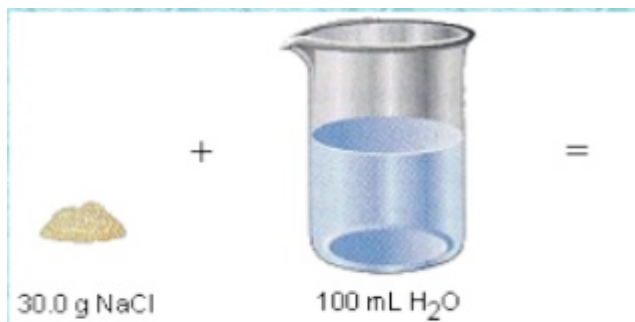
Solubility Curves

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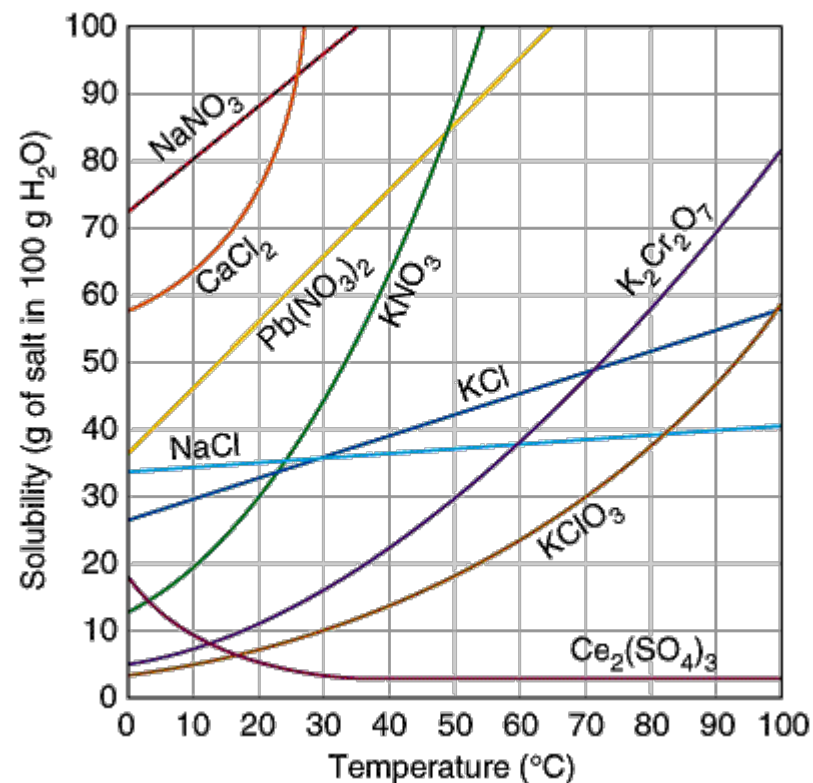
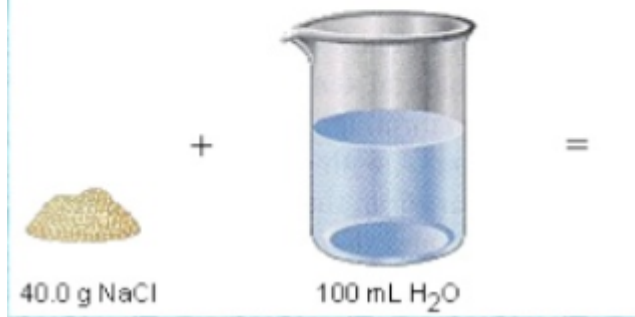
80. grams



A.



B.



Use the chart on the right to answer the following questions, the water is 40°C.

1. What will be the result of A.?
2. What will be the result of B.?

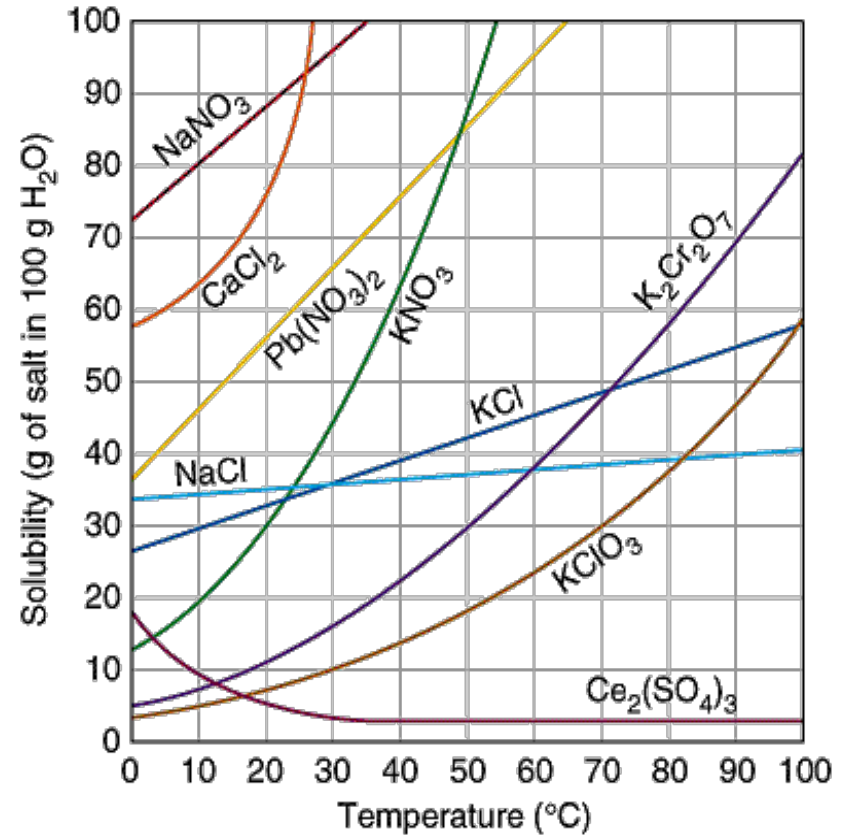
Check the next slide for the answer



Practice #1

If you dissolve 40. grams of KCl in 100 grams of water at 80°C, what type of solution will you have?

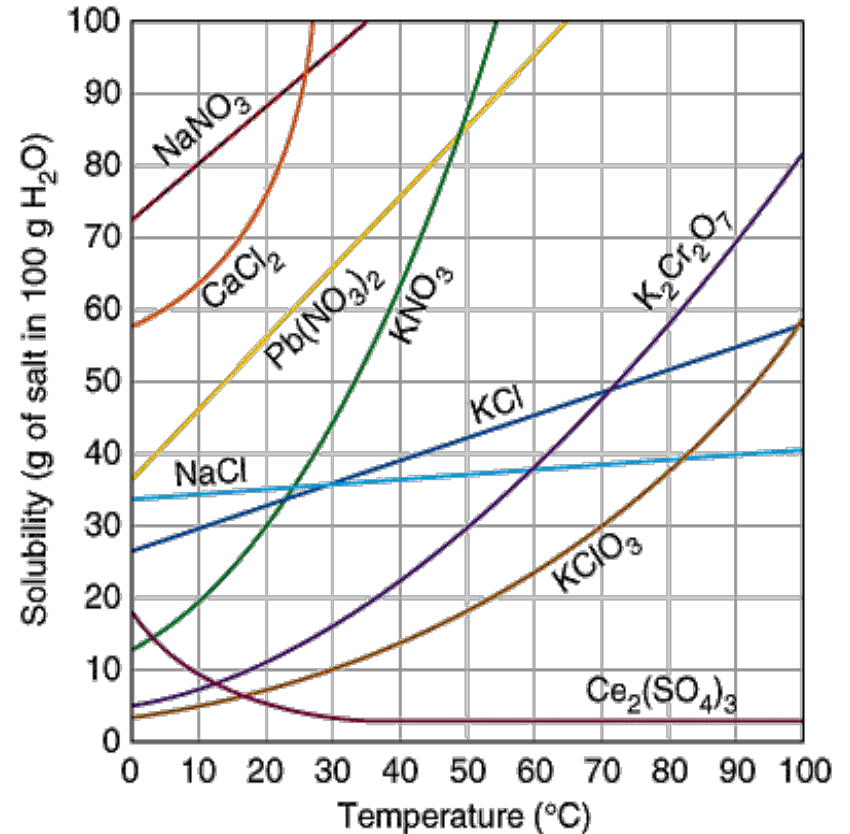
Unsaturated, saturated, super saturated



Practice #1

If you dissolve 40. grams of KCl in 100 grams of water at 80°C, what type of solution will you have?

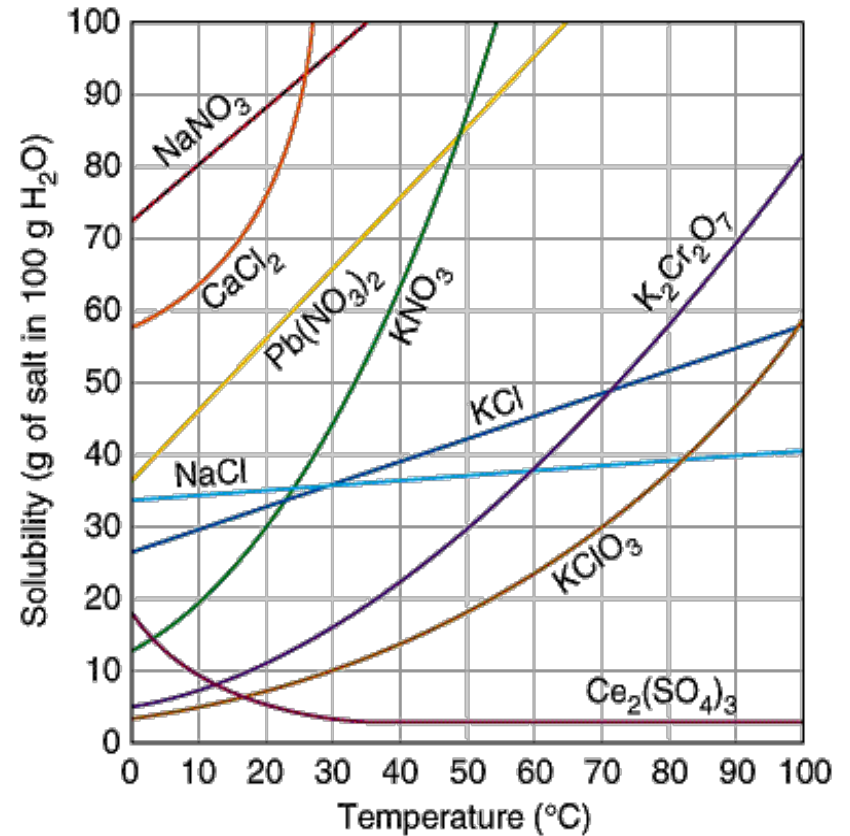
Unsaturated, saturated, super saturated



Practice #2

If you dissolve 70. grams of $\text{Pb}(\text{NO}_3)_2$ in 100 grams of water at $30.^\circ\text{C}$ what type of solution will you have?

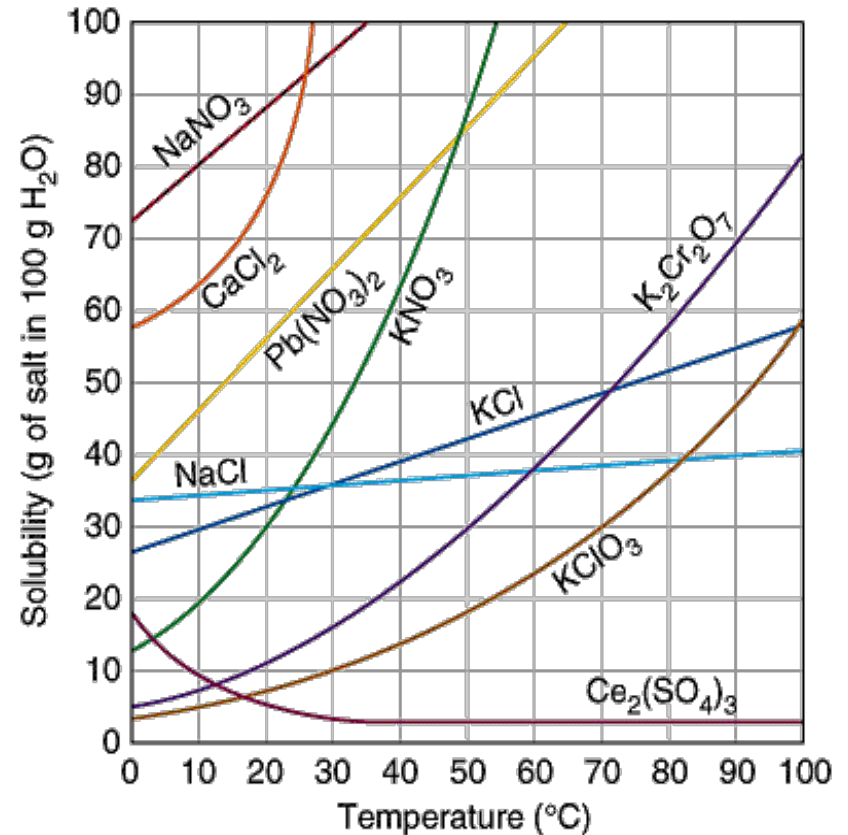
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Practice #2

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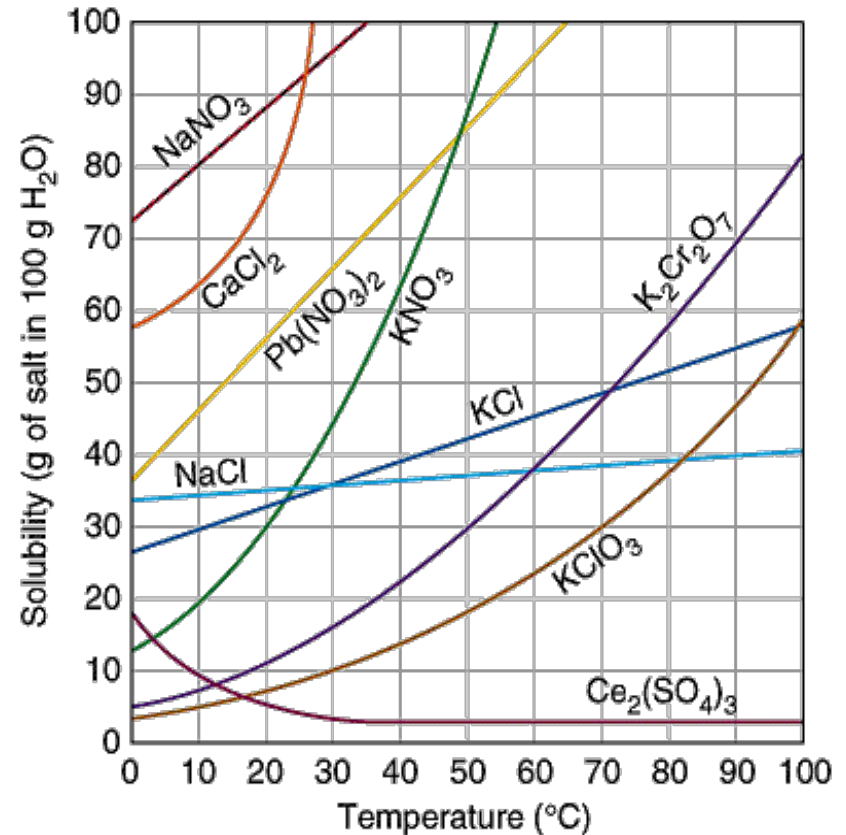
Unsaturated, saturated, super saturated



Practice #3

If you dissolve 19 grams of KClO_3 in 100 grams of water at $50.^\circ\text{C}$ what type of solution will you have?

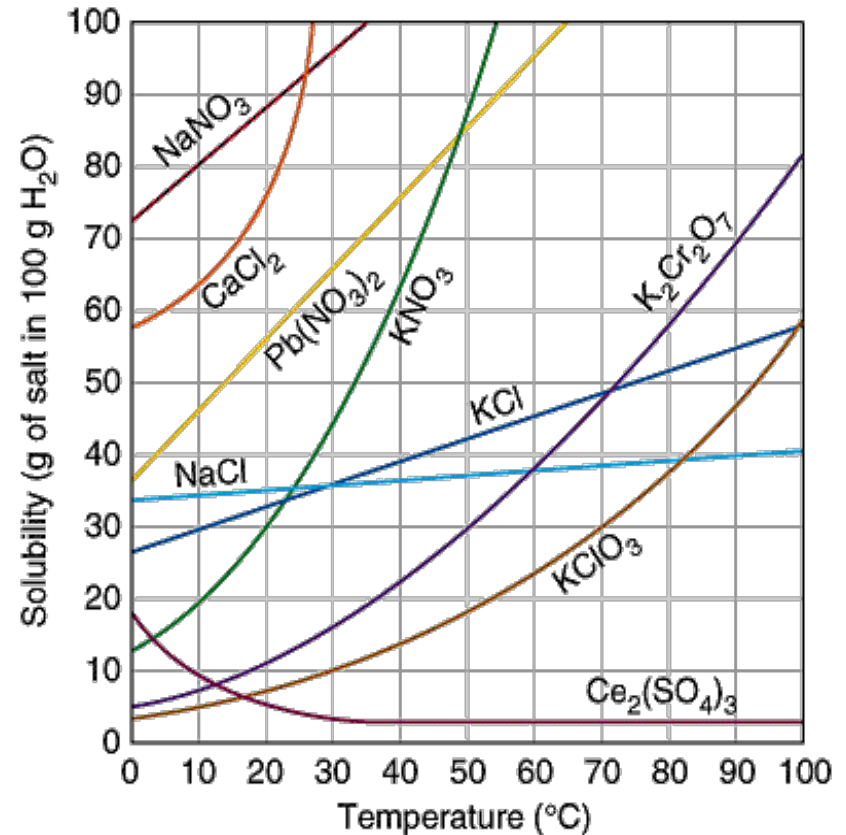
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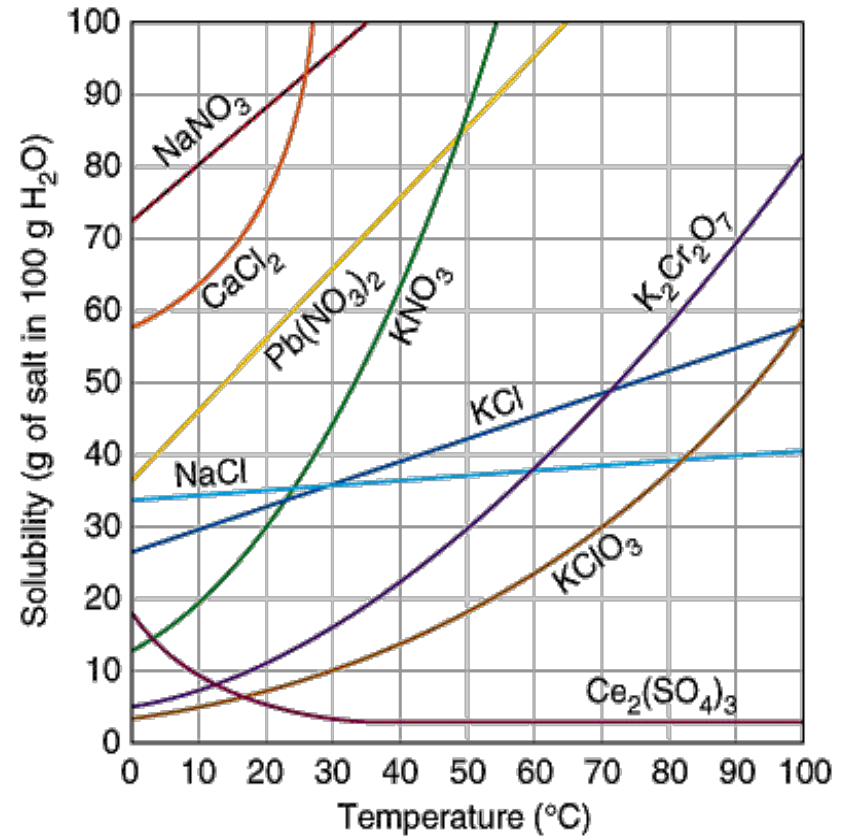
Unsaturated, saturated, super saturated



Challenge

How many grams of NaCl can be dissolved in 300 grams of water at 90°C?

Work out an answer before going to the next slide.

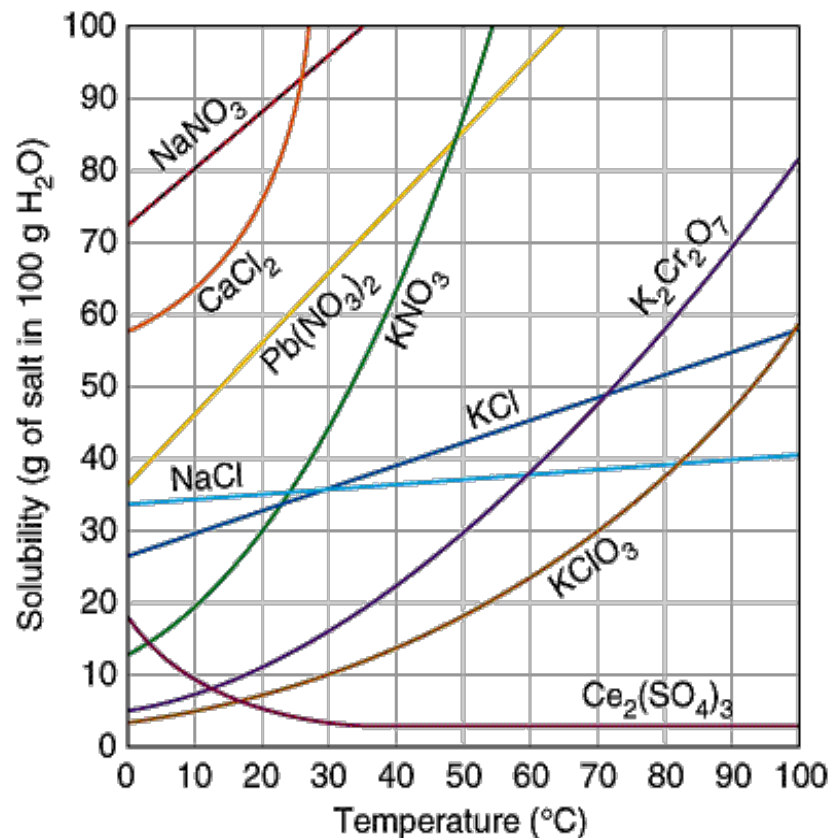


Challenge

How many grams of NaCl can be dissolved in 300 grams of water at 90°C?

The chart shows 40 grams NaCl can dissolve in 100 g H₂O

300.g H ₂ O	40 g NaCl	= 120.g NaCl
	100.g H ₂ O	

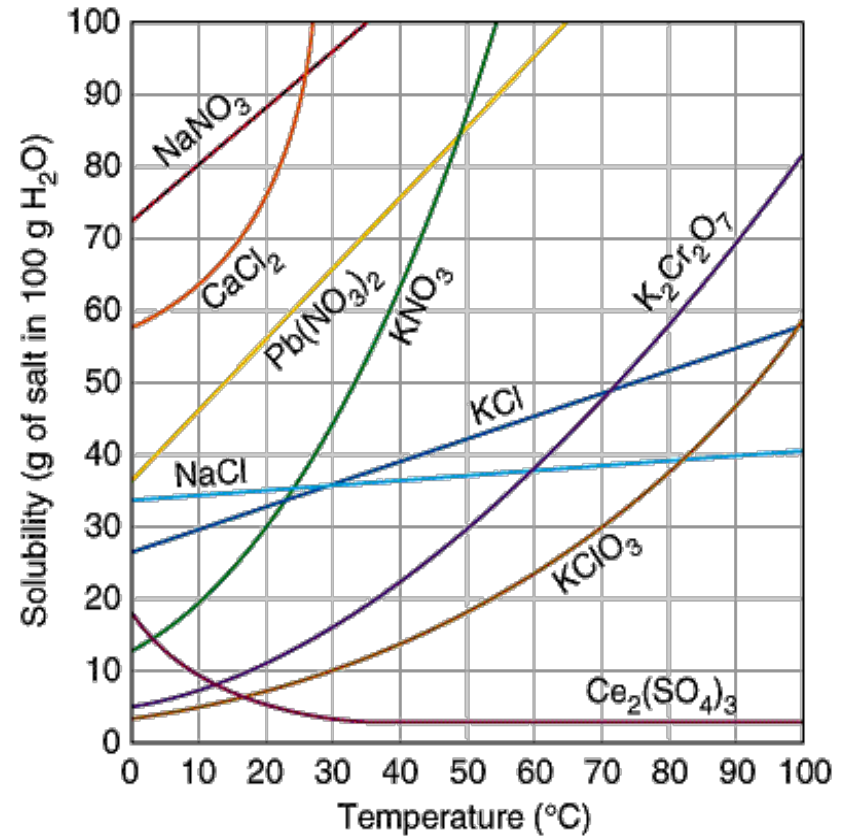


In general....

If the temperature increases

the amount of solute that can be dissolved also

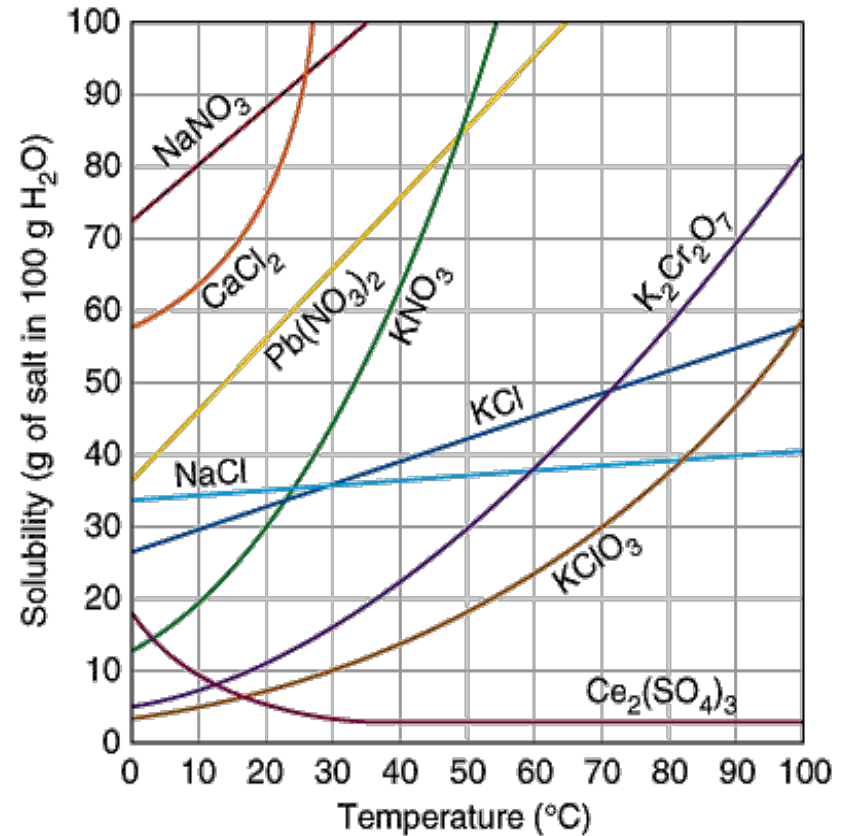
_____.



In general....

If the temperature increases

the amount of solute that can be dissolved also
increases .



Summary

I can gain information from a solubility curve.

I can make predictions using a solubility curve.