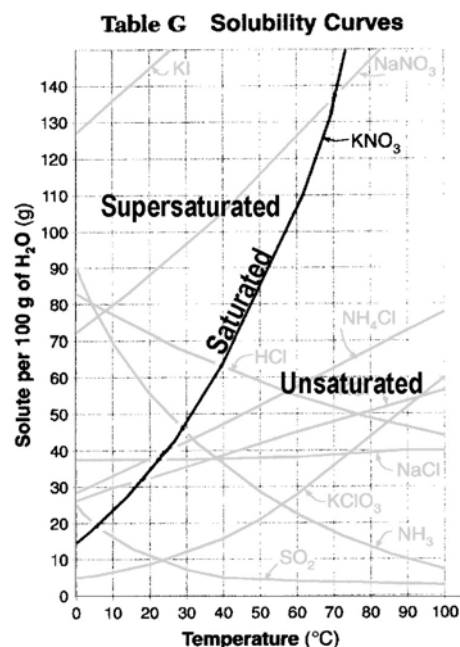


Solubility Curves

The solubility of solid solutes generally increases as temperature increases, while the solubility of gaseous solutes generally decreases as temperature increases. A solution that holds as much solute as can dissolve at a given temperature is saturated. A solution that can dissolve more solute at a given temperature is unsaturated. A solution that holds more solute than can dissolve at a given temperature is supersaturated. The amount of solute that is needed to form a saturated solution at various temperatures can be graphed. This is what is shown in *Table G*. The values in *Table G* are based on solute dissolved in 100 g of water. Since water has a density of 1 g/mL, the graph can be considered to be based on 100 mL of water. A 200 mL sample of water would be able to dissolve twice as much at each temperature.

Answer the questions below by referring to *Table G*.

- The compound which is the most soluble at 20°C is _____.
- The compound which is the least soluble at 10°C is _____.
- The compound which is the least soluble at 80°C is _____.
- The number of grams of potassium nitrate needed to saturate 100 mL of water at 70°C is _____.
- The formulas of the compounds which vary inversely with the temperature are _____ and _____.
- One hundred mL of a sodium nitrate solution is saturated at 10°C. How many additional grams are needed to saturate the solution at 50°C? _____
- One hundred mL of a saturated KCl solution at 80°C will precipitate 10 grams of salt when cooled to what temperature? _____
- The two salts that have the same degree of solubility at 70°C are _____ and _____.
- The salt with a solubility is least affected by a change in temperature is _____.
- The salt that has the greatest increase in solubility in the temperature range between 30°C and 50°C is _____.
- The number of grams of sodium nitrate that must be added to 50 mL of water to produce a saturated solution at 50°C is _____.
- A saturated solution of potassium chlorate is made at 10°C by dissolving the correct mass of salt in 100 mL of water. When the solution is heated to 90°C, how many grams must be added to saturate the solution? _____



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13. At what temperature do saturated solutions of sodium chloride and potassium chloride contain the same mass of solute per 100 mL of water? _____
 14. A saturated solution of potassium nitrate is prepared at 60°C using 200 mL of water. If the solution is cooled to 30°C , how many grams will precipitate out of the solution? _____
 15. How many more grams of ammonia can be dissolved in 100 mL of water at 10°C than at 90°C ? _____
 16. A saturated solution of sodium nitrate in 100 mL of water at 40°C is heated to 50°C . The rate of increase in solubility grams per degree is _____.
 17. Thirty grams of KCl is dissolved in 100 mL of water at 45°C . The number of additional grams of KCl that would be needed to make the solution saturated at 80°C is _____.