10 Concentration and Saturated Solutions

Concentration

As you now know from the previous lesson you can make up a solution with 1 spatula of sodium chloride in 7cm^3 of water. You can also make up a solution with 2 spatulas of sodium chloride in the same volume of water. Sodium chloride is the chemical name for salt.

Do you think both solutions would taste the same?

Do not do this!

The one with 2 spatulas of sodium chloride in the same volume of water would taste saltier and is said to be a stronger solution.

We say the stronger solution is more **concentrated**.

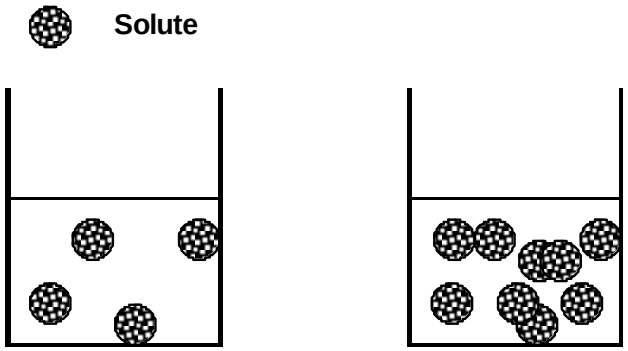
Concentration is a measure of how much solute has been dissolved in a set volume of water (the solvent). We would say the second solution above is twice as concentrated as the first solution because it has twice the number of spatulafuls dissolved in the same volume of water.

Notes:

1. What does **concentration** tell us about a solution?
2. Which of the following pairs of solutions are most concentrated
   - i) A one spatula of ammonium nitrate in 50cm^3 of water or
     B two spatulas of ammonium nitrate in 50cm^3 of water
   - ii) A one spatula of potassium nitrate in 50cm^3 of water or

B one spatula of potassium nitrate in 100cm^3 of water

3. Copy the following diagrams into your jotter and label one 'High Concentration' and the other one 'Low Concentration'.



Saturated Solutions

A **saturated solution** is one, which contains the maximum amount of solute which can dissolve in the solvent at that temperature.

Notes: Copy and Complete:-

A saturated solution is one which contains the _____ quantity of solute which can dissolve at that _____.

Growing Crystals

One of the uses of saturated solutions is in making and growing crystals.

Collect:
1 test tube
1 spatula
crystallising dish
250cm^3 beaker
stopper
bottle of alum powder
saturated alum solution

Activity:

1. Half fill the beaker with hot tap water.
2. Put about 2cm depth of the saturated solution into the test tube, place the test tube into the hot water in the beaker and leave for about 5minutes.
3. Add one spatulaful of solid alum to the test tube, stopper and shake till it dissolves.
4. Keep adding solid one spatula at a time, stoppering and shaking until a small quantity of solid is left on the bottom.
5. Put two large crystals of alum on the bottom of the crystallising dish and pour the liquid from the test tube onto the crystals. (leaving any solid behind)
6. Leave till next Science period.

Notes: Copy the the heading and complete:-

If a saturated solution is heated _____ solute can dissolve. When a hot _____ solution is cooled the extra solid comes out of solution and forms _____. All the crystals of a substance have the same basic _____.