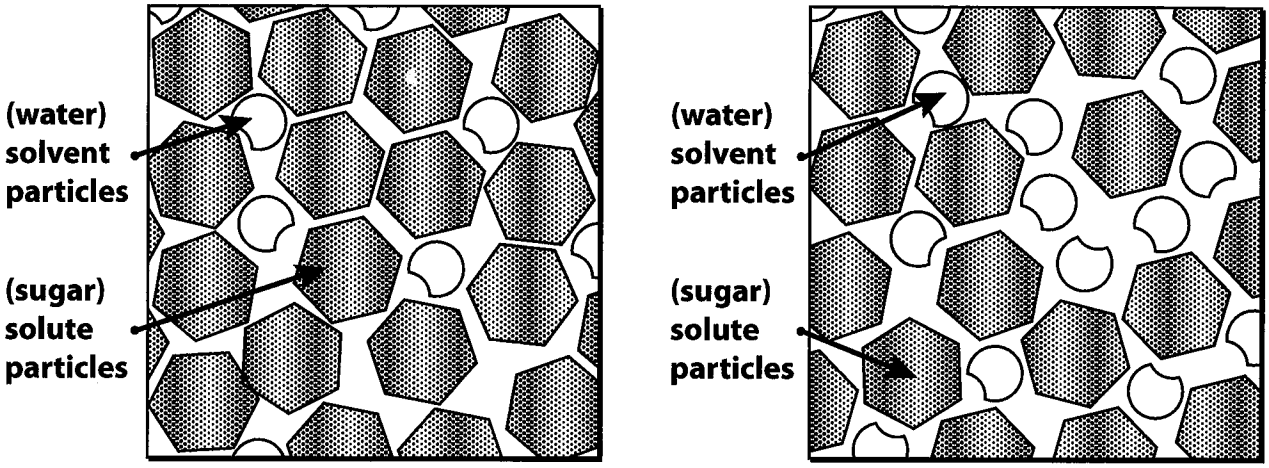
What is solubility? – I

When a substance dissolves in water, the powder or crystals are broken down into even smaller particles and distributed evenly throughout the water. This mixture of a solid dissolved in a liquid is called a **solution**. The solid is called the **solute** and the liquid is the **solvent**. The solvent separates the solute particles and takes up the space between the solute particles.



solution **saturated solution**

The maximum amount of solute that can dissolve in a known quantity of solvent at a certain temperature is its **solubility**. Some things (for example, salt) are highly soluble in water because they dissolve easily. A solute that does not dissolve easily (for example, pepper) has low solubility.

A solute can be made to dissolve faster.

When a solute dissolves, it does so only on the outer surface of each particle. As the outside layer is dissolved, it exposes the next layer. This continues until the whole particle has disappeared. So a solute in a form with greater surface area will dissolve faster than those with lesser surface area; for example, a sugar cube dissolves more slowly than the same weight of sugar as loose crystals.

When a solute is stirred into a solvent, the stirring action brings the solute particles into contact with more solvent, thereby also increasing the dissolving rate.

A liquid solvent can only dissolve a given amount of solute at a given temperature. If any more solute is added, the solution will no longer look clear. It will start to turn cloudy and the solute can be seen at the bottom of the container. When the solution stops looking clear, the solvent has reached its **saturation point** for that solute at that temperature and is called a **saturated solution**. There is no room in the solvent for any more solute molecules. But if the solution is heated, more solute can be dissolved until the saturation point for the solvent at the higher temperature is reached.

Not all solutes dissolve in all liquid solvents. Water is known as the 'universal solvent' because there are many solutes that will dissolve in it.

Solubility is an important factor in the manufacture of dehydrated foods. Instructions on the packets of dehydrated foods tell you how much water, stock or milk is required to make the product to the correct consistency. Such foods have made a significant contribution to the welfare of people living in areas where fresh foods are not readily available; for example, dried milk, which has all the nutrition of fresh milk, has been a life saver for young children living in famine struck areas of the world and where there have been natural disasters.