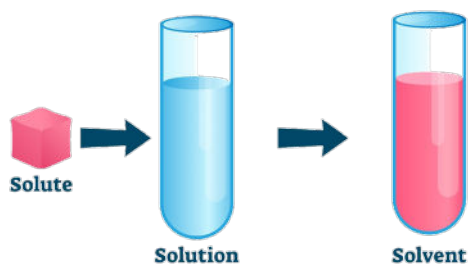


Solutions, Acids, & Bases

Section I: Solutions, Solubility, & Concentration



Solutions are an important type of mixture. A **solution** is a mixture that has the same composition, color, density, and taste throughout. In order to describe a solution, one or more substances must be dissolved in another substance. The **solute** is the substance being dissolved, while the **solvent** is the substance doing the dissolving.

For example, when a spoonful of sugar is added to a glass of water, the sugar dissolves, forming a solution. In this example, sugar is the solute, and water is the solvent. Although many people think of solutions as liquids, solutions can also be gases, such as the air you breathe, or solids, such as sterling silver.

The process of forming a solution can happen more quickly under certain conditions. There are three main ways to speed up the rate of dissolving. First, stirring a solution brings more solvent into contact with the solute. As the solvent particles attract the solute particles, the solute dissolves faster. Another way to speed up dissolution is to increase the solute's surface area. For example, breaking a solid into smaller pieces or crushing it into a powder allows more solvent to contact the solute at once. Finally, increasing the temperature of the solvent can also speed up dissolving. Warmer particles move faster, causing them to bump into each other more often and spread throughout the solvent more quickly.

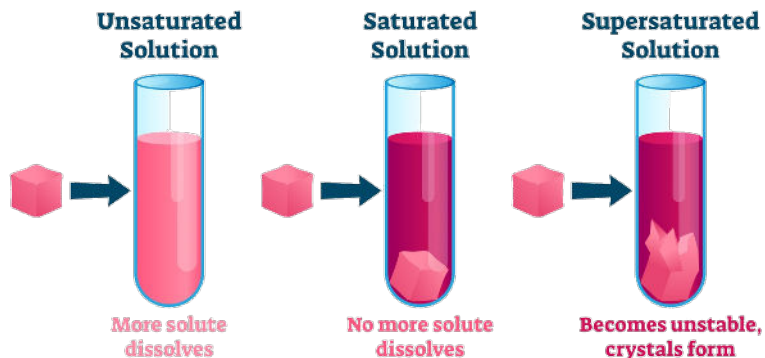
Even though many substances can dissolve, there is a limit to how much solute a solvent can hold. The maximum amount of solute that can dissolve in a given amount of solvent under certain conditions is called **solubility**. A substance's solubility can change when conditions change. For example, more sugar can dissolve in hot water than in cold water. However, not every substance dissolves in every solvent. Oil and water do not mix evenly because oil does not dissolve in water. When a substance does not dissolve in a solvent, it is called **insoluble**.

Another important way to describe a solution is by its concentration. **Concentration** is the amount of solute dissolved in a given amount of solvent. A **concentrated** solution has a large amount of solute dissolved in it, while a **dilute** solution has only a small amount of solute.

Solutions, Acids, & Bases

Section I: Solutions, Solubility, & Concentration Cont.

A **saturated** solution contains all the solute it can hold at a given temperature. If a solution can still dissolve more solute, it is **unsaturated**. In some cases, a solution can contain more solute than it normally should at a certain temperature. This is called a **supersaturated** solution, and it is unstable.



Review:

1. In a solution, what is a solute? What is a solvent?
2. What does it mean if something is insoluble?
3. Compare saturated to unsaturated.