



Mixtures and Solutions

Substances, Mixtures, and Solutions

A **SUBSTANCE** is something that can't be broken down into simpler parts and physical changes won't alter its composition. A substance is made of a single compound.

Example: Water (H₂O) is a substance. No matter what physical processes you put water through (like freezing or boiling), water will remain H₂O

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A **MIXTURE**, on the other hand is made of different substances mixed together that aren't chemically bonded. Salad dressing is a mixture of different things like oil, herbs and lemon juice.

There are two kinds of mixtures:

1. **Heterogeneous Mixture**: a mixture where the substances are **not** evenly mixed. A salad is an example of a heterogeneous mixture, every bite of a salad is different no matter how many times you mix the salad.

There are two kinds of mixtures:

2. **Homogenous Mixture**: a mixture where the molecules of each substance are equally mixed, and you can't see the different parts of the mixture. Sugar that is dissolved in water creates a homogenous mixture- you can't see the sugar and the water, just a liquid that contains molecules of both.

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Sometimes homogenous mixtures are called **SOLUTIONS**. A solution is made of a **SOLUTE** and a **SOLVENT**. A solute is the substance that gets dissolved, and the solvent is the substance that dissolves the solute.

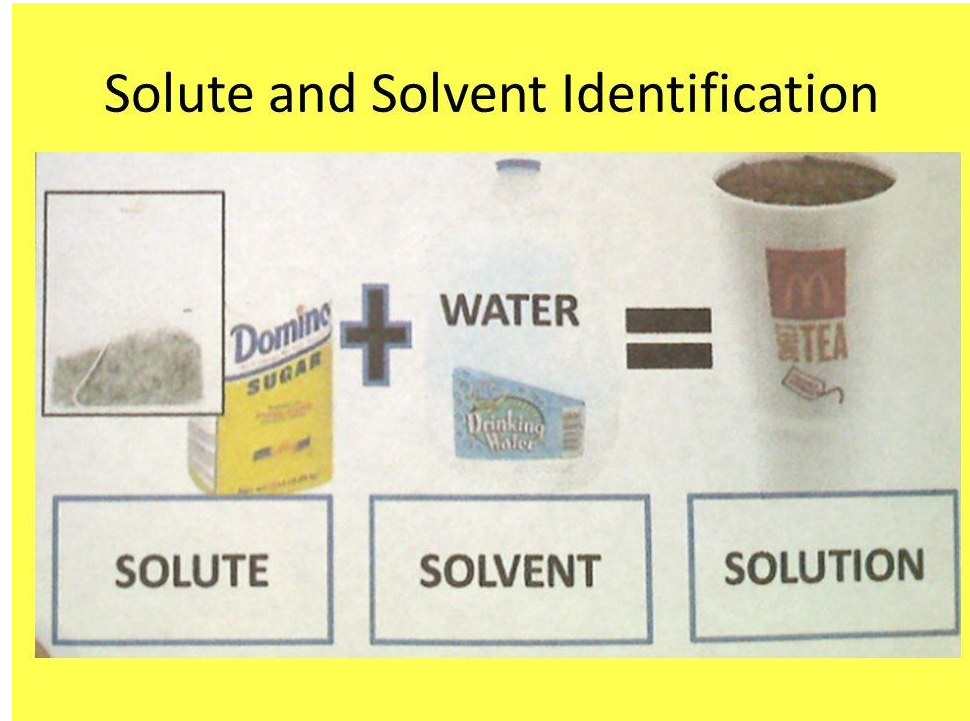
Example: Some sports drinks are a solution that is made of water (the solvent) and powdered sports drink mix (the solute).

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Solution- a homogeneous mixture

Solute- the substance that is dissolved into the other substance

Solvent- the substance into which the solute dissolves



Solubility

SOLUBILITY is the ability of a substance to dissolve in another substance. Lots of things affect solubility:

1. **Temperature**: Usually solid solutes are more soluble in water at high temperatures, which is why it is easier to dissolve sugar in hot water.

Solubility

2. **Gas Solutes**, like carbonation, are the opposite of solid solutes. Gases are more soluble in liquids at colder temperatures. Carbonated beverages remain fizzy longer when they are cold because gas is more soluble in cold liquids
3. **Pressure and Concentration** of other solvents in a solution also affect solubility.

Concentration

The **CONCENTRATION** of a solution is the amount of solute contained in a solution. A **CONCENTRATED SOLUTION** has a lot of solute, while **DILUTED SOLUTION** has very little solute.

Example: Lemon sports drink solution, a concentrated solution would be really sour and sweet, and a diluted solution would taste watery.

Pressure

A **FLUID** is anything that can flow, like liquids and vapors. A fluid, like all other forms of matter, exerts PRESSURE, or pushes, on its surroundings.

Example: air that fills a balloon exerts pressure on the sides of the balloon to keep it inflated. Meanwhile, pressure from the atmosphere pushes on the outside of the balloon. As long as the pressure from the inside is greater, the balloon stays inflated.