

CH2 FACT SHEET

MIXTURES

Matter rarely exists in a pure state. Most materials are combined with different materials to form *mixtures*. A **mixture** is any combination of substances that can be separated by *physical* means. Mixed matter can be sifted, filtered, or distilled to separate the materials making up the mixture. The substances themselves are not changed when they are separated in this manner. They are simply isolated from one another and purified.

Many of the substances we take for granted every day are manmade mixtures. Glass is a mixture of melted sand (called silica) and soda-salt (called sodium carbonate). Glass was introduced in the Middle East around 3,000 B.C. Concrete is a mixture of sand and broken stones. Concrete was first used as a building material in the Middle East around 700 B.C. Steel has been in existence for about two hundred years. It is an **alloy** which is a mixture of metals. Steel is a combination of iron and carbon. Metals such as iron are found naturally mixed with other metals to form **ores**. Iron ores must be heated to very high temperatures before the pure iron can be extracted from the ore.

A **solution** is a liquid mixture. Solutions contain particles of **solute** dissolved in a liquid **solvent**. Most common liquids are mixtures. Even the water that comes out of the faucet in your home is a mixture of water and a variety of minerals. Scientists classify solutions as either **homogeneous** or **heterogeneous**. A homogeneous solution contains a well dissolved solute present in equal amounts throughout the solvent. Salt water is a homogeneous solution. A heterogeneous solution contain solutes that are not equally distributed throughout the solvent. Salad dressing made with oil and vinegar is a heterogeneous solution.

The amount of a solute that can be dissolved in a liquid solvent depends on the temperature of a solution. Increasing temperature usually increases the amount of material that can be dissolved in the solution. **Solubility** is a measure of the amount of solute that can be dissolved in a solvent at a particular temperature. Scientists use **solubility graphs** to show the solubility of different substances. Solubility can be used to identify an unknown sample of matter.

Gases are also found mixed together. The air we breathe is a combination of gases. Our atmosphere is 78% nitrogen gas and 21% oxygen gas. The remaining 1% is a mixture of other gases like carbon dioxide and argon.