

## Solutions

**Solutions** are homogeneous mixtures of two or more substances. The **solute** is the substance that is dissolved. The **solvent** is the substance in which the solute is dissolved.

Most solutions contain more solvent than solute. The rate at which a solute dissolves in a given solvent usually can be increased by

- stirring or shaking the mixture.
- breaking or crushing the solute into smaller particles.
- heating the solution.

As a general rule, a solvent will dissolve a solute that is chemically like itself. The **solubility** of a substance is the amount of solute that can be dissolved in a certain amount of solvent at a given temperature. If a substance is **insoluble** in a solvent, it will not dissolve in the solvent.

A solution can be described as either concentrated or dilute. A **concentrated** solution contains a large amount of solute compared to the amount of solvent. It is a strong solution. A **dilute** solution has a small amount of solute compared to the amount of solvent. It is a weak solution.

When a solution has dissolved all of the solute that it can dissolve, the solution is described as **saturated**. If more solute can be dissolved in a solution, the solution is described as **unsaturated**. When a solution has dissolved more solute at a particular temperature than it normally does, the solution is said to be **supersaturated**.

Unscramble each term below. Write its correct spelling in the first blank. Next, match each term with its definition. Write the definition's letter in the second blank.

- NIOTLOSU Solution C
  - UILETD Dilute B
  - ECNNTAECORTD Concentrated H
  - EUAUATRSRESPTD Supersaturated I
  - VSOIELDS Dissolve D
  - ASURETTDNUA Unsaturated J
  - NLBLOISUE Insoluble G
  - STLLOE Solute E
  - STNVLOE Solvent F
  - DTUTARASE Saturated A
- A. cannot dissolve more solute  
 B. weak  
 C. homogeneous mixture  
 D. to go into solution  
 E. substance that is dissolved  
 F. substance that does the dissolving  
 G. will not dissolve  
 H. strong  
 I. contains more solute than normal  
 J. can dissolve more solute

## More About Mixtures

**Mixtures** contain more than one kind of substance. The properties of a mixture are a blend of the properties of the materials that are combined in the mixture. A mixture's properties vary depending on the amount of each substance present in the sample.

Mixtures can be made by combining liquids, solids, or gases together in various ways. The substances in a mixture can be separated by physical means.

There are two kinds of mixtures: **heterogeneous mixtures** and **homogeneous mixtures**. In a **heterogeneous mixture**, the parts of the mixture are not evenly distributed. Oil and vinegar salad dressing is an example of a heterogeneous mixture. The oil and the vinegar do not mix together evenly. The parts of a **homogeneous mixture** are evenly distributed. The mixture is the same throughout. Sugar and water combine to form a homogeneous mixture.

**Solutions** are homogeneous mixtures that form when one substance is dissolved in another substance.

Six ways to physically separate mixtures are listed below. Correctly match them to the mixture that they would best separate.

- letting something settle f
  - distillation B
  - evaporation C
  - using a magnet E
  - physically separating with your hands A
  - using a centrifuge D
- a. blood  
 b. alcohol and water  
 c. sugar and water  
 d. wood chips and iron filings  
 e. peas and beans  
 f. sand and water

The four ways to make a mixture are listed at the top of this page. An ice cream float is an example of a mixture made from a solid, a liquid, and a gas. The ice cream is solid, the soda pop is liquid, and the carbonation is a gas. Write the letter of the combination that describes each mixture below.

- B nuts and bolts
  - D salt and water
  - F polluted air
  - A oil and water
  - C air in a scuba tank
  - E wet, sudsy clothes in a washing machine
- A. liquid and liquid  
 B. solid and solid  
 C. gas and gas  
 D. liquid and solid  
 E. solid, liquid, and gas  
 F. solid and gas