Solutions

- mixtures of substances

Most of the substances present in our environment are mixtures that consist of several components in different physical states. In **heterogeneous mixtures**, components can be distinguished by the naked eye - they are separate phases. In **mixtures of homogeneous** ingredients it is impossible to distinguish - they form one phase.

water with salt

water with oil

A **homogeneous mixture** that contains substances dissolved in a solvent is called a **solution**. The particles of the **solute** may have different sizes and there are always less of them than **solvent** particles. **The type of solvent** determines the physical state of the solution. In **liquid solutions**, the solvent is liquid. There are also **gaseous solutions** in which the solvent is gas. The solvent may also be solids. They form **solid solutions**.

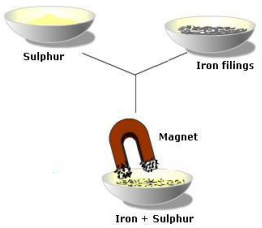
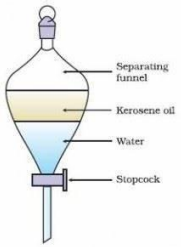
Due to the particle size of the substance dissolved in a liquid solvent, it is distinguished by:

~ proper solutions in which the diameter of the particles is less than 10^{-9} m.

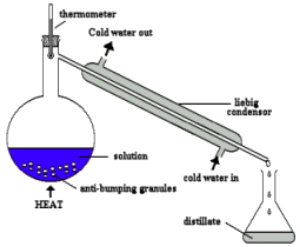
~ colloids in which the particles of the substance have a diameter of 10^{-9} – 10^{-7} m.

~ suspension, in which the average particle size is greater than 10^{-7} m.

Selected methods of separating heterogeneous mixtures.

	method				
property used	application		sedimentation	decantation	filtration
	magnet	separator			
magnetic properties	+				
density		+	+	+	
physical state of the ingredients			+	+	+
particle size			+	+	+
method illustration					

Methods for separating homogeneous mixtures.

	method		
property used	crystallization	solvent evaporation	distillation
boiling point		+	+
solubility in a given solvent	+		
volatility	+	+	+
method illustration			

Dissolving substances in water is a **physical phenomenon**. There are no chemical reactions between the solute molecules and the solvent molecules. They are only connected by intermolecular interaction. Hydrogen bonds can form in such solutions, and molecules can also be broken down into ions. After evaporation of the solvent, the solute is recovered in its original state.

Solutions are formed by **digestion**. A chemical reaction then takes place between the solute and the solvent or between the solute and the other component of the solution. After evaporation of the solvent, the products of this chemical reaction are obtained.