

Solution

A **solution** is a homogeneous or seemingly homogeneous mixture of at least two substances - a solute and a solvent (in excess). The particles of these substances are perfectly mixed and do not react with each other.

Solution types

True solutions (homogeneous mixture)

A homogeneous mixture contains only particles smaller than 10^{-9} m , e.g. true solutions

- **gaseous** – molecules of one gas dispersed between molecules of another gas, e.g. air
- **liquid** – is the most common, molecules or ions of low molecular weight substances dispersed in a liquid, e.g. NaCl solution in water
- **solid** – individual atoms (ions) of one solid substance dispersed between particles of another solid substance, e.g. metal alloy

Colloidal solution (colloidal mixture)

Molecules of organic substances or clusters of inorganic molecules dispersed in a liquid, eg proteins in water

The colloidal mixture contains only particles with a size in the range of $10^{-7} - 10^{-9} \text{ m}$, e.g. aerosol, colloidal solution, emulsion

Dispersion – a mixture of substances, one of which is finely dispersed (dispersed) in another

Dispersion medium – if the mixture contains a substance that is continuous throughout the volume of the system

Solvent Types

A **solvent** is a substance with the ability to dissolve substances, creating homogeneous mixtures → solutions.

Classification by Polarity

Polar

- contain an ionic or covalent polar bond, e.g. water
- dissolves polar and ionic compounds, e.g. NaCl
- they are divided into protic (protolytic reactions take place in them with a detachable proton – alcohols, $\text{NH}_4(\text{l})$) and aprotic (acetone)

Non-polar

- no or only non-polar functional groups → dissolve non-polar substances, e.g. plastics, mothballs
- non-polar substances have a smaller electronegativity difference, so they are more difficult to separate
- they are not miscible with water
- e.g. gasoline

Links

Related Articles

- Solutions
- Analytical dispersions

Resources

- LEDVINA, Miroslav, et al. *Biochemistry for medical students*. 2nd edition. Prague: Karolinum, 2009. 548 pp. ISBN 978-80-246-1414-4 .
- BENEŠOVÁ, Marika and Hana SATRAPOVÁ. *Graduate! from chemistry*. 1st edition. Brno: Didaktis, 2002. 208 pp. ISBN 80-862-8556-1 .
- Presentation from the website of the Institute of Medical Biochemistry and Laboratory Diagnostics.

HOMOGENEOUS MIXTURE = SOLUTION

= a mixture in which the individual components cannot be distinguished by sight, magnifying glass or microscope

division of solutions: a) solid (brass, bronze...)

b) liquid (salt water, mineral water,...)

c) gaseous (air,...)