Concentration Encyclopedia Article

Concentration

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Concentration

The proportional amount of a component present in a mixture of substances is given by its concentration. In a liquid **solution**, one of the components is designated the solvent, while all other components are called solutes. The solvent is either the only liquid component of the solution or the liquid in the highest concentration. In aqueous solutions, **water** is the solvent and all dissolved substances are solutes. The concentration of a solute in a liquid solution may be given in the following ways:

1. Percentage composition on weight basis: the weight of solute divided by the total weight of all substances in the solution, including the solvent, multiplied by 100.

2. Molarity: the number of moles of the solute present in 1 liter of solution. The **molarity** is usually designated by a capitol M. After percentage composition, molarity is the most common way to express concentration.

3.**Mole** fraction: the number of moles of the solute present divided by the total number of moles of all substances in the solution, including the solvent.

4. Molality: the number of moles of the solute present in 1000 grams of solvent. The **molality** is usually designated by a lower case m.

5. Formality: the number of formula weights of the solute in a liter of solution. Formality is usually designated by F.

6. Normality: the weight of a solute that would react with 8 grams of **oxygen** (or one equivalent of another oxidant) or with 1 gram of **hydrogen** (or one equivalent of another reductant) present in one liter of solution. It is usually designated by N.

The concentration in other mixtures, such as a mixture of **gases**, may be expressed in a similar manner to that in solutions.