

What are Colligative Properties?

March 28

2013

This guide is provided by Andrew Nassif, and is part of a series explanatory on science. This guide will include real life examples of Colligative properties in Chemistry as well as define them.

A Guide to the
Simple Idea in
Chemistry

Colligative Properties, What are they?

Colligative properties are properties in chemistry in which properties of a solution that depend on the number of dissolved particles in a proposed solution, for example salt water has lower freezing point than pure water because of the existence of salt in it.

The 8 Major Methods to Finding Colligative Properties Are:

1. Mass Percentage

- a. The number of properties found in the mass itself
- b. The percentage of mass with properties in the element itself

2. Volume Percentage

- a. The percentage of volume that has properties

3. The Mass of the Solute Inside a Definite Mass of a Solvent

- a. The mass of a solute inside the known mass of a solvent itself

4. The Mass of a Solute per the Definite Mass in a Solution

- a. Mass of solute per definite known masses

5. Molarity

a. A measurement of molar concentration

- i. Amount of constituent divided by the volume of the mixture
- ii. The SI unit is mol/m³

6. Normality

a. The normal known concentration

- i. Molar Concentration divided by equivalence factor
 1. Uses common number of reactive species in a solution

7. Molality

- a. Amount of substance as defined in the solute

8. Mole Fraction

- a. Amount of constituent of a chemical/by total # of constituents in a mixture

Included in Colligative Properties are:

1. Relative Lowering of Vapor Pressure

a. Vapor pressure is called the pressure exerted by vapor in a thermodynamic equilibrium

2. Elevation of Boiling Point

a. The action that the boiling point of a liquid gets higher when another compound is added

3. Depression of Freezing Point

a. Process that happens when a solute added to a solvent and decreases the freezing point

4. Osmotic Pressure

a. Is the pressure that needs to be applied to a solution to prevent inward flow of water toward a semipermeable membrane

Partial Molar Free Energy:

1. In thermodynamics it is known as the chemical potential

2. In Semiconductor Physics it is known as the Fermi Level

3. Diffusion of Micro and Macro mol² Colligative Properties

Semi-Conductor Physics

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