

Immiscible is the term used to describe two liquids that are not soluble in each other

-nonpolar substances such as oils, fats, and greases will not dissolve in a polar substance such as water.

Miscible is the term used to describe substance that will freely dissolve in one another in any proportion

ex: ethanol and water

Gasoline is composed of mainly nonpolar hydrocarbons, so it is an excellent solvent for fats, oils, and greases.

Oil based paints require paint thinner to remove wash them from your hands, if you don't have paint thinner, gasoline will also work (caution, do not smoke while doing this)

Effects of Pressure on Solubility

Pressure has very little effect on dissolving solids or liquids in a liquid. However, gases dissolved in liquids is effected.

Higher Pressure = More Dissolved Gases
in a Liquid

Henry's Law

The solubility of a gas in a liquid is directly proportional to the partial pressure of that gas on the surface of the liquid.

Example - soft drinks. The "air" in a sealed bottle of coke is essentially pure carbon dioxide. It is this pressure that allows more of the CO₂ to be dissolved in the liquid.

Effervescence is the rapid escape of a gas from a liquid in which it is dissolved

Effects of Temperature on Solubility

Increase in temp decreases solubility of a gas

Increase in temp often increases solubility of solids

Enthalpies of Solutions

As solutions form, energy is either gained or lost. This change is due to changes in the intermolecular forces associated with the molecules.

The net amount of energy absorbed as heat by the solution when a specific amount of solute dissolves in a solvent is called the **enthalpy of solution**.

Negative enthalpies represent heat is lost
(exothermic)

Positive enthalpies represent heat is gained
(endothermic)

Concentrations of Solutions

-concentration is simply the measure of solute
in a given amount of solvent or solution

Molarity

-number of mols of solute in one liter of
solution

- a capital M is used for molarity. 1.5 M NaCl
means that there are 1.5 mols of salt in one liter
of solution. Hence there would be 87.8 g of
NaCl in one liter.

Molality

-the concentration of a solution expressed in mols of solute per kilogram of solvent

$$\text{molality} = \frac{\text{mols of solute}}{\text{kilograms of solvent}}$$

molality is represented by a script lowercase *m*

Changing Concentration

In order to determine a new concentration (in molarity) of a substance, use:

$$M_1V_1 = M_2V_2$$

The product of the molarity and the volume will equal the number of mols of solute in a solution. This number remains constant as you add more volume of solvent.

Determine how many grams of NaCl are needed to create 250 mL of 2.5 M NaCl solution.

Concentrated HCl acid is 12 M, determine how to make a 100. mL 3 M solution

What is the new concentration of a 225 ml solution that has a molarity of 2.8 if it is diluted to 500. ml?

What is the molarity of 202 g of calcium chloride dissolved in 980 mL of solution?

