

SCH 3U

TYPES OF SOLUTIONS

DEFINITIONS:

1. SOLUTIONS versus PURE SUBSTANCES

Solutions



variable compositions



Salty water contains varying amounts of salt dissolved in the water.

Pure Substances



fixed compositions



pure water = 2 Hs & 1 O

2. SOLUTION = a homogeneous mixture of 2 or more substances

SOLVENT

= any substance that has other substances dissolved in it

SOLUTE

= other substances that are present in the solution

- when a solute dissolves in a solvent, no chemical reaction occurs.
- separating solute from solvent depends on **physical properties**.

TYPES OF SOLUTIONS

- various combinations of solute and solvent **states** are possible
- gases, liquids and solids mixed together

- AQUEOUS SOLUTIONS = a solution in which water is the solvent
 - MISCIBLE = *miscible* liquids can be combined in any proportions
 - ethanol and water are miscible -- either can be the solvent
 - IMMISCIBLE = liquids that do not readily dissolve in each other
 - oil and water
- ALLOYS = solid solutions of metals
 - bronze-- 10% tin and 90% copper
 - coins -- copper and nickel

SOLUBILITY & SATURATION

1. SOLUBILITY = is the amount of solute that dissolves in a given quantity of solvent, at a certain temperature.
 - solubility of salt in water at 20°C is 36 g per 100 mL of water.
2. SATURATED SOLUTION = formed when no more solute will dissolve in a solution
 - In above example, no more than 36 g of salt will dissolve in 100 mL of water at 20°C; however, the solution may be able to dissolve other solutes.
3. UNSATURATED = a solution that can still dissolve more solute; it is not yet saturated.

SOLUBILITY IN SOLVENTS:

- general rules for SOLIDS and LIQUIDS are as follows:

In 100 mL of solvent:

< 0.1 g	0.1 g --- 1 g	> 1 g
insoluble	sparingly soluble	soluble

- general rules for solids and liquids do **not** apply to GASES
 - oxygen in water -- 0.0009 g/100 mL of fresh water is sufficient to ensure survival of aquatic life

LIKE dissolves LIKE...

- polar solvents dissolve polar solutes
- non-polar solvents dissolve non-polar solutes