

# Solubility Review



# What is Solubility?

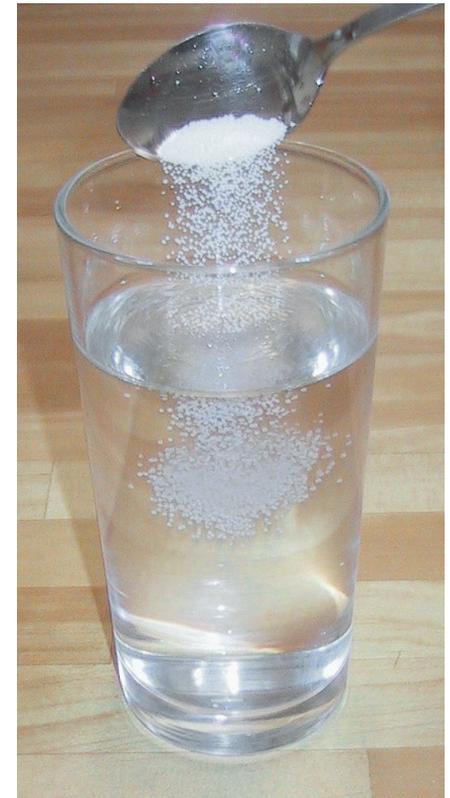


Solubility is the measure of how well one substance (**solute**) dissolves into another (**solvent**)

If sugar is dissolved into water:

Salt is the **Solute** \_\_\_\_\_.

Water is the **Solvent** \_\_\_\_\_.



If a solute dissolves into a solvent, then it is:

**Soluble**

If the solute will not dissolve, then it is:

**Insoluble**

**Solution**

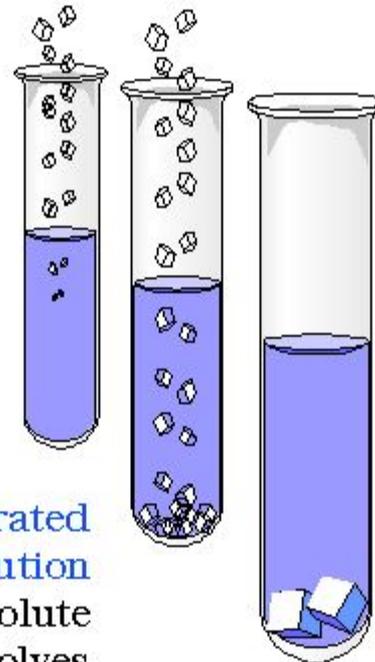
A \_\_\_\_\_ is created when a solute dissolves into a solvent.

When a solution cannot dissolve any more solute, it is a \_\_\_\_\_ **Saturated Solution** \_\_\_\_\_.

If more solute can still dissolve, the solution is \_\_\_\_\_ **Unsaturated Solution** \_\_\_\_\_.

# Saturated Solutions

unsaturated  
solution  
more solute  
dissolves



saturated  
solution  
no more solute  
dissolves

supersaturated  
solution  
added crystals  
grow

Example:

If you try to stir sugar into iced tea, but no more will dissolve, then the solution is

– **Saturated** –

If you can still dissolve more lemonade mix into the pitcher of water, then the solution is

· **Unsaturated** ·

Oil will not dissolve in water because it is

· **Insoluble** –

# What if the solute is insoluble?

A **Suspension** is created when large, undissolved particles are in the solvent. These particles can be filtered out, or will eventually settle.

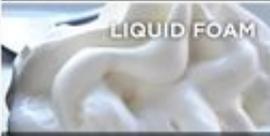
A **Colloid** is created when the solvent contains very small, undissolved particles. These particles are too small to see, and will not settle.

# FUN FACTS ABOUT COLLOIDS

Colloids are common materials with one material that is evenly distributed within another material at a very tiny scale.

Some common examples of colloids include milk, fog, jelly, styrofoam, and whipped cream.

Within colloids, a substance ("Substance A") is even distributed within another substance ("Substance B"). Depending on whether these are solid, liquid, or gas, the resulting colloidal materials are called:

		SUBSTANCE A		
		GAS	LIQUID	SOLID
SUBSTANCE B	GAS	<p><b>NONE</b></p> <p>All gases are mutually miscible, so they do not form any sort of colloid.</p>	<p><b>LIQUID AEROSOLS</b></p>  <p>Fog, hair sprays, clouds</p>	<p><b>SOLID AEROSOLS</b></p>  <p>Smoke, air particulates</p>
	LIQUID	<p><b>LIQUID FOAM</b></p>  <p>Whipped cream, shaving cream</p>	<p><b>EMULSION</b></p>  <p>Milk, mayonnaise, hand lotion</p>	<p><b>SOL</b></p>  <p>Pigmented ink, blood, paint</p>
	SOLID	<p><b>SOLID FOAM</b></p>  <p>Styrofoam, pumice</p>	<p><b>GEL</b></p>  <p>Gelatin, jelly</p>	<p><b>SOLID SOL</b></p>  <p>Cranberry glass</p>

Source: Wikipedia

# Why do some things dissolve better than others?

There are many factors that affect solubility.

- Materials
- Stirring/mixing
- Temperature
- Surface Area/Size of particle
- Already dissolved solute

# How does the material/substance affect the solubility?

- Some materials are more soluble than others.
- As a general rule, like dissolves like. Substances must have similar characteristics to be soluble. If these characteristics are different, then they are insoluble.
- Ex: Alcohol dissolves easily into water, but oil and water will never mix.

# The affect of stirring on solubility.

The more we stir, mix, or shake a mixture, it will make the solute dissolve \_\_\_\_\_ **Faster** \_\_\_\_\_.

## The affect of Temperature on solubility.

For most mixtures, if we \_\_\_\_\_ **Increase** \_\_\_\_\_ the temperature, the solute will dissolve much easier.

# How does the size of the particle affect solubility.

If the particles of the solute are larger, then it will take much **longer** for them to dissolve

## How will it affect solubility if the solution already has dissolved solute?

If a solution already contains dissolved material, it will be much more **Difficult** for a solute to be dissolved.

# Decreasing Particle Size

- A large lump of solid sugar dissolves slower than an equal mass of powdered sugar.



- WHY?
- When you break up the large mass into many small masses, **you increase the surface area** that is in contact with the solvent.
- This allows the solid to dissolve faster, increases solubility.



## COMPOUNDS & MIXTURES

