

What is a solution?

Solutions are homogeneous mixtures of 2 or more substances

They are well mixed. You can't see separate phases (parts)

Examples: air, tap water, steel, vinegar, rubbing alcohol, kool aid, salt water, brass

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Vocab

Solvent: substance doing the dissolving. Usually present in a larger amount. **ex: water in salt water**

Solute: substance that gets dissolved. **ex: salt in salt water**

Soluble: a substance that can be dissolved in a solvent **ex: salt is soluble in water**

Insoluble: a substance that won't dissolve in a solvent **ex: sand is insoluble in water**

Solvation: process of surrounding solute particles with solvent particles to form a solution

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Salt forming a solution

<http://group.chem.iastate.edu/Greenbowe/sections/projectfolder/simDownload/index4.html#solutions>



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Factors Affecting the Rate of Solvation

Agitation : (stirring or flicking) increases the rate of solvation (substance dissolves faster with mixing)

Particle Size: smaller particles solvate faster (crushed pellets dissolve faster than whole pellets)

Temperature : usually higher temp = fast solvation (salt in boiling water dissolved faster than in water at room temperature or cooler)

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Solubility

Solubility : the maximum amount of solute that will dissolve in a given amount of solvent at a particular temperature.

usually given as:

- grams of solute per grams of solvent
- grams of solute per mL of solvent

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"Likes dissolve likes"

-- phrase scientists use when predicting the solubility

-- means that dissolving occurs when the solute and solvent are similar

-- substances that are similar in size (mass) and polarity (polar or nonpolar) will be soluble

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Water: The Super Solvent

-- Sometimes called the UNIVERSAL SOLVENT because its versatility as a solvent

-- water is small and polar -- its ability to attract other small polar particles makes it an excellent solvent

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Water dissolves many covalent substances

-- Water also is a good solvent for many covalent compounds

-- sucrose (table sugar) is an example

-- It's possible to dissolve almost 200 g of sugar in 100 mL of water

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Temperature and Solubility

-- Solubility of solids usually increases with an increase in temperature (direct relationship)

-- The solubility of a gas in a liquid usually decreases with an increase in temperature (indirect relationship)

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Pressure and Solubility

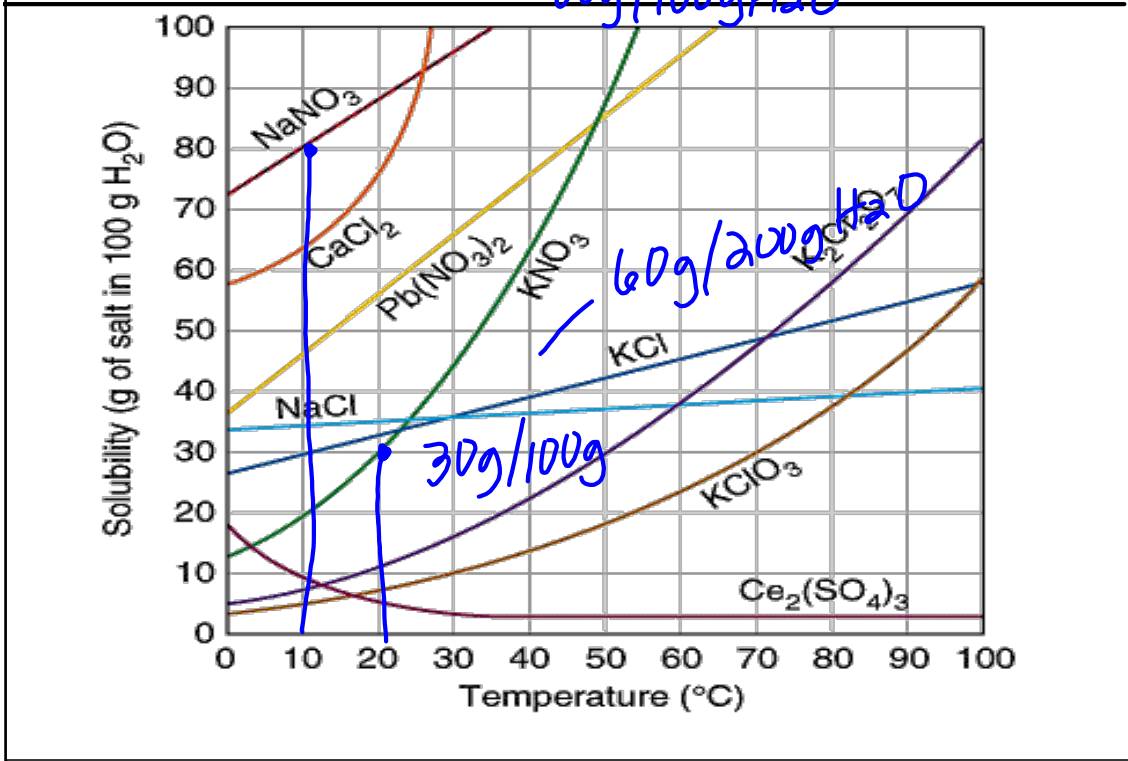
-- As the external pressure of a gas in any solution increases, its solubility increases

-- Pressure and solubility are directly related

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Solubility Graph

$$\frac{30g}{100g} = \frac{xg}{112.5g}$$



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