Solutions

Factors affecting dissolving

1) Agitation (stirring) - speeds up dissolving blc the 2 substance come into contact more often

2) Temperature

Solids

↑ temperature, solid will dissolve faster

why?

particles have more kinetic energy so they move faster, come into contact more often

↓ temperature, solid dissolves slower

Gases

↑ temperature, gases dissolve slower

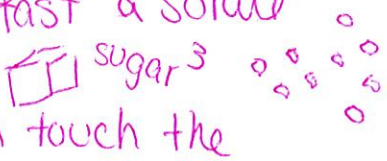
why? particles have too much kinetic energy & leave the solution.

↓ temperature, gases dissolve faster

why? particles have less kinetic energy, not enough to leave the solution.

3) Surface Area

↑ surface area, ↑ how fast a solute dissolve.



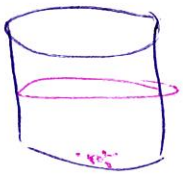
Why? The more surface that can touch the liquid, the faster it dissolves

Terms

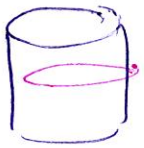
solute - substance that gets dissolved, in smaller amounts

solvent - substance that does the dissolving, in larger amounts

saturated solution - a solution that has dissolved the maximum amount of solute it can at a given temp. (there's a little solute left at the bottom)



unsaturated solution - the solvent has NOT dissolved all it can at that temp.



Supersaturated solution - the solvent has more solute dissolved than it can normally hold at that temp. Very unstable

dilute - small amount of solute in larger amount of solvent

concentrated - large amount of solute dissolved

solubility - mass of solute that can dissolve in a given amount of solvent

Solubility

"like dissolves like"

- polar solutes dissolve in polar solvents & nonpolar solutes dissolve in nonpolar solvents

BUT

polar doesn't dissolve in nonpolar & vice versa

polar substances vs **nonpolar substances**

ionic (metal & nonmetal)

or

polar covalent (2 nonmetals)

electronegativity diff. is .5 or ↑

pure covalent (2 nonmetals)

electronegativity diff is < .5

Ex CO_2 — Polar: C 2.5, O 3.5

H_2O — Polar: H 2.1, O 3.5; 1.4

CH_4 — nonpolar: C 2.5, H 2.1; .4

Ex) dirt (nonpolar) + H_2O (polar) → can't get clean

dirt (nonpolar) + H_2O (polar) + soap (polar + nonpolar)

Ex) Vitamins A, D, E, K are fat soluble (nonpolar)

Vitamins B & C are water soluble (polar)