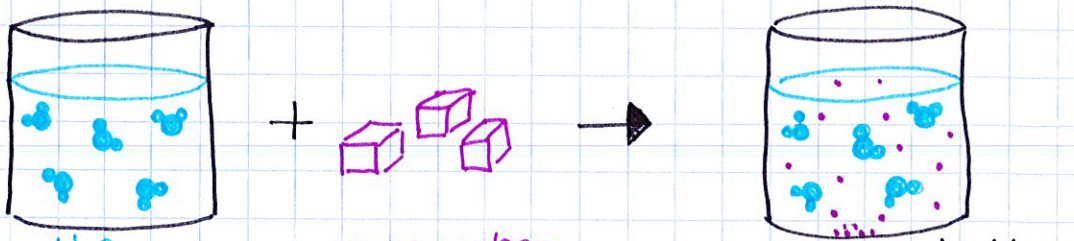
Solutions



solvent - substance that does the dissolving

solute - substance that gets dissolved

what solutes dissolve in what solvents?

"Like dissolves Like"

Polar solvents dissolve Polar solutes.

1. Ionic compounds polar.

Ex. NaCl

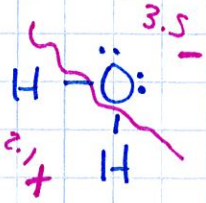
formed from Na^+ and Cl^-

Put into water, NaCl breaks down into:

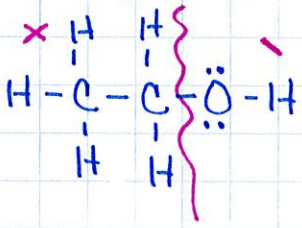
$NaCl(aq) \rightarrow Na^+(aq) + Cl^-(aq)$

2. Polar molecules are polar. one side is more negative (electronegativity) than the other.

Ex. H_2O



Ex. C_2H_5OH



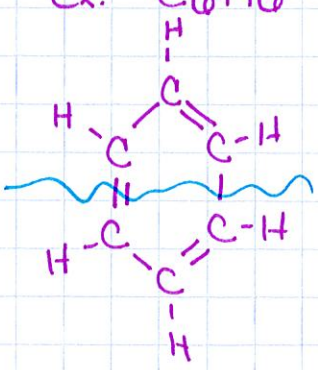
Nonpolar solvents dissolve Nonpolar solutes.

1. Pure covalent molecules are nonpolar

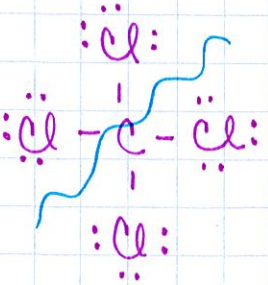
Ex. Br_2

2. Molecules that do NOT have one side more negative than the other.

Ex. C_6H_6



Ex. CCl_4



Ex (1) Can these solutes dissolve in these solvents?

	solute	solvent	Y/N?
(A)	CH_4 NP	H_2O P	N
(B)	K_2SO_4 P	H_2O P	Y
(C)	NaCl P	C_6H_6 NP	N
(D)	C_3H_8 NP	C_2H_5OH P	N
(E)	$C_{12}H_{22}O_{11}$ P	CF_4 NP	N
(F)	$C_{12}H_{22}O_{11}$	H_2O	Y

What's the best way to remove dirt?

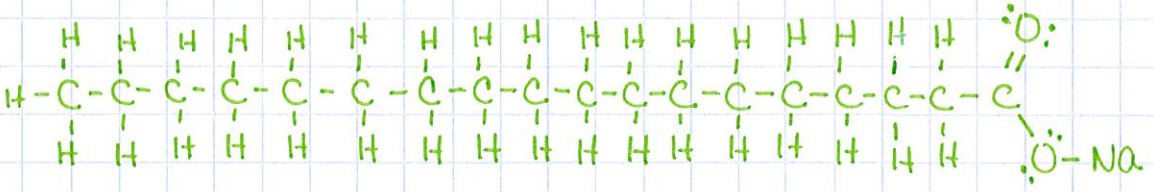
- Just water?

H_2O is polar
Dirt is nonpolar

will not get rid of dirt

- Soap & water?

H_2O is polar
Dirt is nonpolar
Soap is both polar & nonpolar



sodium stearate (typical soap)

Why is it never a good idea to take too many vitamins?

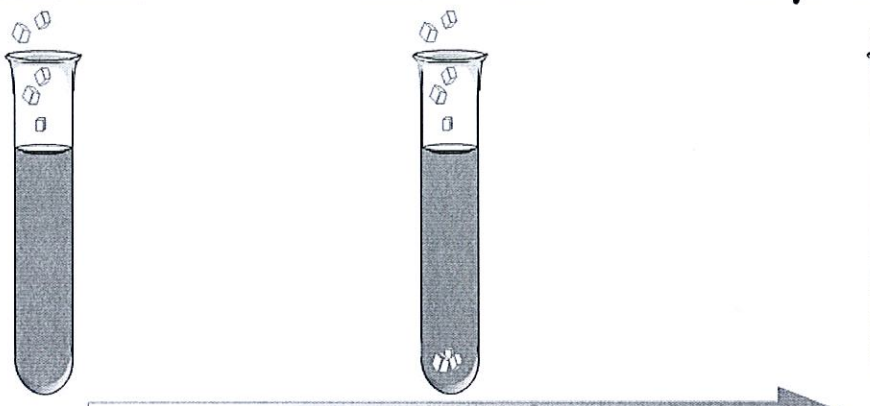
Water soluble vitamins

B & C

Fat soluble vitamins

A, D, E, & K

UNSATURATED SOLUTION	SATURATED SOLUTION	SUPERSATURATED SOLUTION
more solute dissolves	no more solute dissolves	becomes unstable, crystals form



has less than the maximum amount of solute dissolved at that temp.

dissolved all the solute it can at that temperature

dissolved more than the maximum amount of solute at that temp.

Concentrated Solution vs. Dilute Solution

has a lot of dissolved solute

has a little dissolved solute

Can a solution be both saturated & dilute at the same time? Explain.

Yes

↳ max. amount of solute is dissolved

↳ only a small amount of solute dissolved