

Real-Life Applications of Solutions

1. Vitamins

water soluble vitamins: B & C *cannot od*

fat-soluble vitamins: A, D, E, & K *can od*
↳ nonpolar

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

2. Cleaning

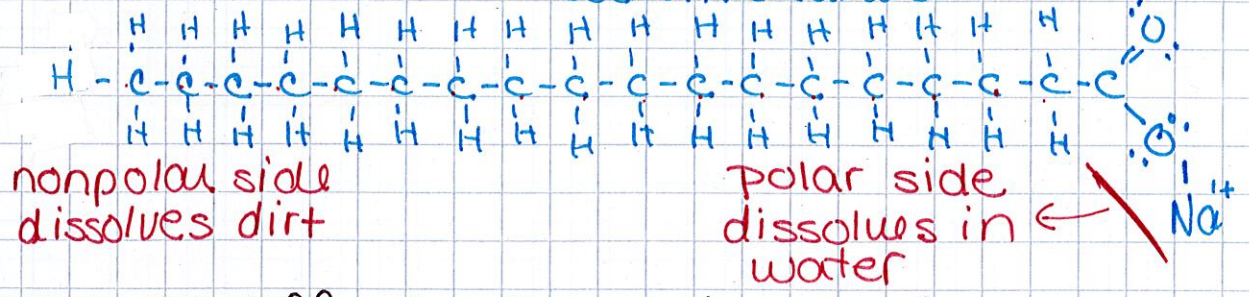
What is the best way to remove dirt? *(nonpolar)*

w/ H₂O only?
↓
polar

H₂O is polar, it will not dissolve all the dirt.

w/ soap & H₂O?
↓
is both polar & nonpolar

sodium stearate



FACTORS Affecting How Fast a Solute Dissolves

1. Agitation (stirring) - makes a solute dissolve faster

why? solute & solvent collide more often

2. Surface Area - increasing surface area makes a solute dissolve faster

why? Breaking a solute apart (↑ surface area) means more solute available to collide w/ solvent.

3. Temperature

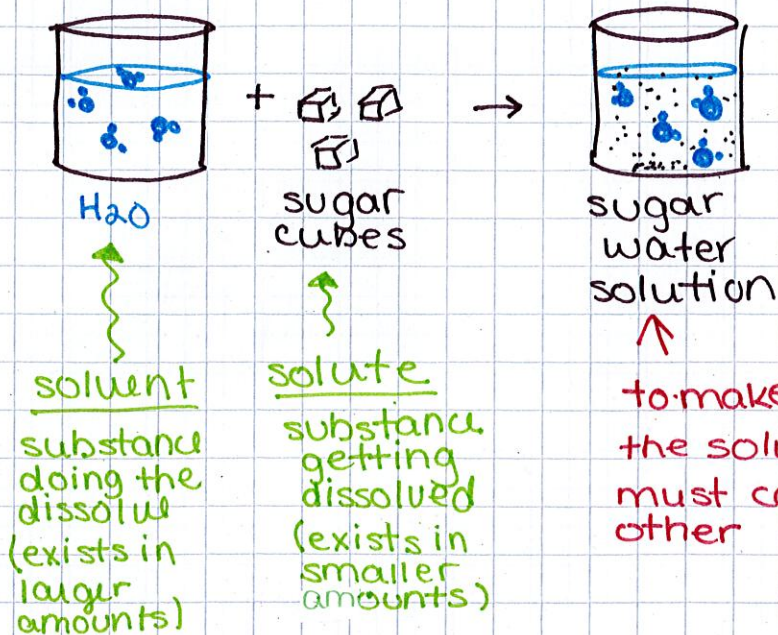
A. solid solutes - higher temps. dissolve solids faster

why? ↑ T means ↑ kinetic energy - move faster, collide more often

B. gas solutes - lowers temps. dissolve gases faster.

why? ↓ T means ↓ kinetic energy - move slower, escape slower

Solutions



to make a solution the solute & solvents must collide w/each other

• what solutes dissolve in which solvents?

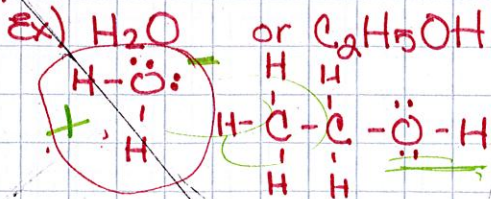
"Like dissolves Like"

Polar solvents dissolve polar solutes

not symmetrical

1. Ionic compounds are always polar (metal & nonmetal)
Ex) sodium chloride $Na^{+} Cl^{-}$

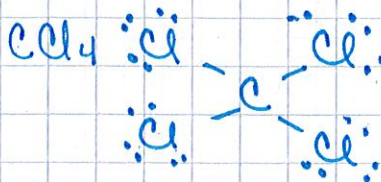
2. Polar molecules that aren't symmetrical are polar.



Nonpolar dissolve nonpolar solutes

one side is symmetrical to the other.

1. Purely covalent molecules are nonpolar
- Ex) N_2



Can oil (nonpolar) dissolve in H_2O ?

No, b/c H_2O is polar & oil is nonpolar!

