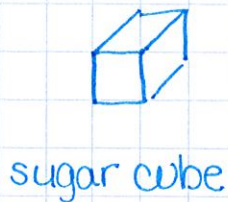


Unit - 8: Solutions & Acids/Bases

- Factors that Affect the Rate of Solvation (Dissolving)

1. Surface Area - The larger the surface area of a substance, the faster it dissolves.



vs.



granulated sugar

2. Agitation (stirring) - more contact b/w substance getting dissolved & substance doing the dissolving

3. Temperature

Liquids & Solids

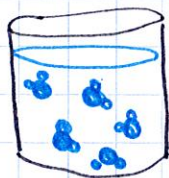
The higher the temp., the faster they dissolve

Gases

The lower the temp., the faster they dissolve

4. Pressure of a Gas - The higher the pressure of the gas, the faster the gas dissolves.

- Solutions (homogeneous mixtures)



H₂O

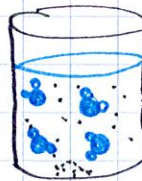
solvent -
substance
that does the
dissolving

+



sugar cubes

solute -
substance that
gets dissolved



sugar solution

what solutes dissolve in what solvents?

"Like dissolves Like"

Polar solvents
dissolve polar
solute.

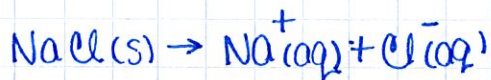
Nonpolar solvents dissolve
nonpolar solutes.

Look @ electronegativities
& shape of molecule.

1. Ionic compounds are
polar.

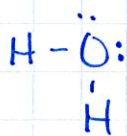
Ex. NaCl

forms Na^+ and Cl^-
in water

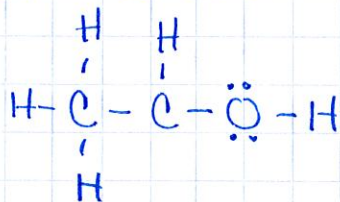


2. Polar covalent molecules
are polar - one side is
more negative than
the other

Ex. H_2O

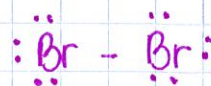


Ex) $\text{C}_2\text{H}_5\text{OH}$



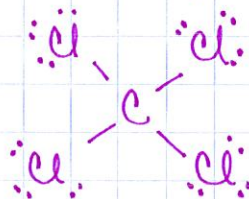
1. Pure covalent molecules
are nonpolar

Ex. Br_2



2. molecules in which one
side is NOT more negative
than the other is nonpolar

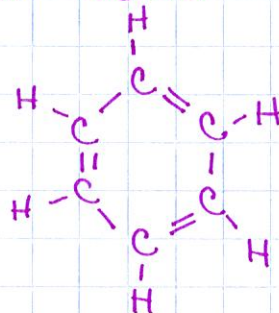
Ex) CCl_4



miscible -
dissolvable

immiscible -
not dissolvable

Ex) C_6H_6



BUT... Polar & Nonpolar substances DO NOT Dissolve.

Practice

(1) Can these solutes dissolve in these solvents?

	<u>solute</u>	<u>solvent</u>	<u>Y/N?</u>
(A)	CH ₄	H ₂ O	
(B)	K ₂ SO ₄	H ₂ O	
(C)	NaCl	C ₆ H ₆	
(D)	C ₃ H ₈	C ₂ H ₅ OH	
(E)	C ₁₂ H ₂₂ O ₁₁	CF ₄	
(F)	C ₃ H ₈	H ₂ O	

(2) What's the best way to remove dirt (nonpolar)?

- Just water?

- soap & water?

H₂O is
Dirt is

H₂O is
Dirt is
Soap is



typical soap (sodium stearate)

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

water soluble
vitamins (polar)

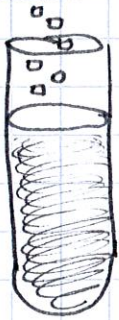
B & C

fat soluble
vitamins (nonpolar)

A, D, E, & K

- Some Definitions

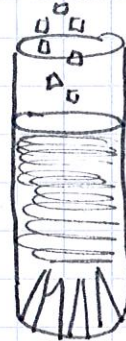
unsaturated solution



saturated solutions



supersaturated solutions



concentrated solution

vs.

dilute solution

Practice - can a solution be both saturated and dilute at the same time? Explain.

Suspension

- non-soluble (immiscible) solid suspended in a liquid
- not clear
- heterogeneous
- settle upon standing (separate)

ex) italian dressing

Colloids

- heterogeneous mixtures that do NOT settle upon standing
- Tyndall effect - scatters light

ex) jello

Emulsions

- colloid of one liquid in another
- will separate if left long enough

ex) mayo