


More on Solutions

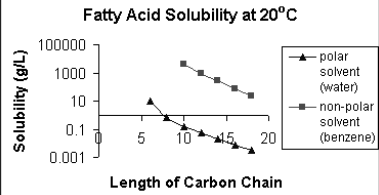
PGCC CHM 101 Sinex

Aqueous Solubility

Fatty Acids: R-COOH
where R is 12-22 carbons



How does the chain length influence solubility?

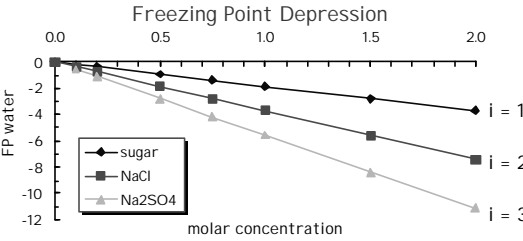


Fatty Acid Solubility at 20°C

Length of Carbon Chain	Solubility in Water (g/L)	Solubility in Benzene (g/L)
5	10	1000
10	1	100
15	0.1	10
20	0.01	1

Why the difference in water and benzene?

What happens to the freezing point of water as a solute is added?



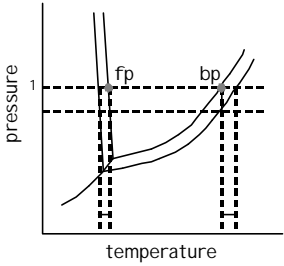
Freezing Point Depression

Molar Concentration	sugar (i=1)	NaCl (i=2)	Na ₂ SO ₄ (i=3)
0.0	0	0	0
0.5	-1	-2	-3
1.0	-2	-4	-6
1.5	-3	-6	-9
2.0	-4	-8	-12

What happens if the solute is an electrolyte?
The number of particles controls the change!

Colligative Properties

As the concentration of solute increases:

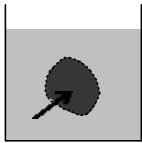


- boiling point - elevated
- freezing point - depressed
- vapor pressure - lowered

— water (solvent)
 — aqueous solution

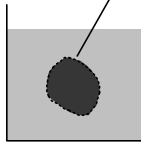
Red Blood Cells

Let's examine the influence of environment on the RBC cell membrane

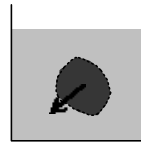


0.1 M NaCl

water diffuses into cell



0.5 M NaCl

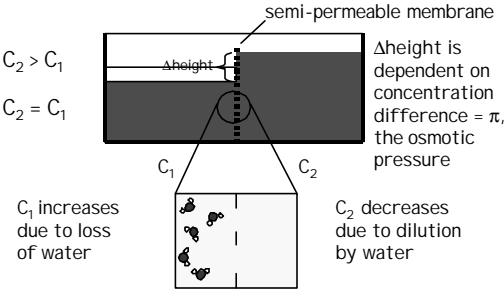


1.0 M NaCl

water diffuse out of cell

What is happening in the various NaCl solutions?
[osmotic pressure simulation](#)

Osmosis and Osmotic Pressure



$C_2 > C_1$
 $C_2 = C_1$

C_1 increases due to loss of water
 C_2 decreases due to dilution by water

Δ height is dependent on concentration difference = π , the osmotic pressure
 only water, the solvent, migrates through membrane
 diffusion due to concentration gradient

