

Unit 9: Solution Properties

adapted from http://www.phschool.com/advanced/lesson_plans/chem_brown_2003/index.html

Objectives:

- Describe the energy changes associated with the formation of a solution and the role of entropy.
- "Like dissolves like!"
- Effects of temperature and pressure on solubility.
- Define units of concentration, mass percent, ppm, mole fraction, molarity, molality, and be able to calculate each from appropriate data.
- Be able to convert a concentration from one unit to the other.
- Describe the effect of solute (or solvent) concentration on each colligative property—vapor pressure, boiling point, freezing point, osmotic pressure. Be able to calculate any of these effects from concentration data.
- Calculate the concentration and molar mass of a nonvolatile, nonelectrolyte from its effect on a colligative property.
- Explain the difference in magnitude of these effects caused by electrolytes compared to nonelectrolytes.
- Define the van't Hoff factor, i .
- Become familiar with the types of colloids.

Lab Objectives:

- Become familiar with one of the colligative properties and use it to determine the molar mass of a substance.

Suggested Labs:

- Colligative Properties: Freezing-Point Depression and Molar Mass

Key Words:

solvation	supersaturated	molality	colloid
hydration	miscible	colligative properties	Tyndall effect
entropy	immiscible	Raoult's law	Aerosol
crystallization	Henry's law	ideal solution	emulsion
saturated	mass percent	molal constants	foam
unsaturated	ppm	osmosis	smoke,
solubility	mole fraction	osmotic pressure	fog
	molarity	Van't Hoff factor	sol

Tips:

- You need to do lots of exercises to practice the concepts and skills from this unit!

