

LO: Students will explore the concepts of solution concentrations.

DOL: Students will correctly solve concentration problems at least 4/5 times.

### Concentrations of Solutions

-concentration is simply the measure of solute in a given amount of solvent or solution

### Molarity

-number of mols of solute in one liter of solution

- a capital M is used for molarity. 1.5 M NaCl means that there are 1.5 mols of salt in one liter of solution. Hence there would be 87.8 g of NaCl in one liter.

## Molality

-the concentration of a solution expressed in mols of solute per kilogram of solvent

$$\text{molality} = \frac{\text{mols of solute}}{\text{kilograms of solvent}}$$

molality is represented by a script lowercase  $m$

Mar 9-10:10 AM

## Changing Concentration

In order to determine a new concentration (in molarity) of a substance, use:

$$M_1V_1 = M_2V_2$$

The product of the molarity and the volume will equal the number of mols of solute in a solution. This number remains constant as you add more volume of solvent.

Feb 22-9:39 AM

Determine how many grams of NaCl are needed to create 250 mL of 2.5 M NaCl solution.

Mar 9-12:27 PM

Concentrated HCl acid is 12 M, determine how to make a 100. mL 3 M solution

Mar 9-1:13 PM

What is the new concentration of a 225 ml solution that has a molarity of 2.8 if it is diluted to 500. ml?

Feb 22-9:36 AM

If 0.885 moles of copper (II) sulfate are dissolved in enough water to make 70.0 mL of solution, what is the molarity of the solution?

If 30.0 mL of 12.0 M HCl stock solution are diluted to a volume of 500. mL, what is the molarity of the dilute solution?

If 27.5 mL of 16.0 M nitric acid stock solution is added to 300. mL of water, what is the molarity of the diluted solution? ( $V_1$  will be 27.5 mL. But for  $V_2$  don't forget to add the volume of the water and the nitric acid to get the total  $V_2$  volume.)

What is the molarity of 202 g of calcium chloride dissolved in 980 mL of solution? The density of calcium chloride is  $2.15 \text{ g/cm}^3$ .

Feb 22-9:44 AM