CONCEPT: MOLALITY

- **Molality (m)** is another way to express solution concentration and is _____ independent.
  - □ Represents the number of _____ of solute per _____ of solvent.

Molality Formula

$$\text{Molality (m)} = \frac{\text{solute}}{\text{solvent}}$$

EXAMPLE: A solution contains 24.8 g of sucrose ($C_{12}H_{22}O_{11}$) dissolved in a 550.0 g of water. Calculate the molality of the solution.

PRACTICE: A solution is prepared by dissolving 43.0 g potassium chlorate, $KClO_3$, in enough water to make 100.0 mL of solution. If the density of the solution is 1.760 g/mL, what is the molality of $KClO_3$ in the solution?

a) 1.99 m b) 3.51 m c) 2.64 m d) 4.70 m

PRACTICE: The density of a 15.7 M methanol (CH_3OH) solution is 0.858 g/mL. If H_2O is the solvent, what is the molality of the solution?

a) 44.2 m b) 18.3 m c) 31.2 m d) 23.7 m

CONCEPT: MOLALITY

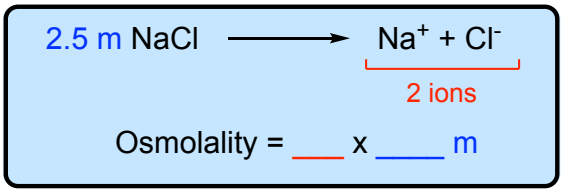
Osmolality

- Osmolality (Ionic molality) represents the _____ of dissolved particles in a solution.
  - □ *Note:* for covalent compounds, # of ions = ____.

Osmolality Formula

Osmolality = (# of ions) x __

- □ Break up ionic compound into ions, count _____ number of ions and multiply by molality of solution.



EXAMPLE: What is the osmolality of total ions in an aqueous solution prepared by dissolving 0.400 moles of $Pb(NO_3)_4$ in 750.0 g water?

PRACTICE: What is the ionic molality of sodium ions in a solution of 25.7 g $NaNO_3$ dissolved in enough water to make a 150.0 mL of solution? Density of the solution is 1.02 g/mL.

a) 1.98 m b) 2.57 m c) 2.98 m d) 2.37 m