CONCEPT: OSMOLARITY

- **Osmolarity** (ionic molarity) represents the number of _____ of *ions* per _____ of *solution*.

Method 1: Direct Calculation of Osmolarity

- In the first method, we use the _____ of *ions* and _____ of solution with its formula to calculate osmolarity.

Osmolarity Formula

$$\text{Osmolarity} = \frac{\text{ions}}{\text{solution}}$$

EXAMPLE: Calculate the molarity of chloride ions when dissolving 58.1 g $AlCl_3$ in enough water to make 500 mL of solution.

Method 2: Osmolarity from Molarity

- If the molarity of a compound is known then the osmolarity for each of its *ions* can be determined by:

Osmolarity Formula

$$\text{Osmolarity} = \_\_\_\_\_ \times \text{M of Compound}$$

EXAMPLE: What is the concentration of hydroxide ions in a 0.350 M solution of gallium hydroxide, $Ga(OH)_3$?

Method 3: Number of Ions from Molarity

- Problems involving # of *ions* and molarity can use a **given amount** and **conversion factors** to isolate an **end amount**.

EXAMPLE: How many moles of Ca^{2+} ions are in 0.120 L of 0.450 M $Ca_3(PO_4)_2$ solution?

CONCEPT: OSMOLARITY

PRACTICE: Which of the following solutions will have the highest concentration of bromide ions?

a) 0.10 M NaBr b) 0.10 M $CaBr_2$ c) 0.10 M $AlBr_3$ d) 0.05 M $MnBr_4$

PRACTICE: How many milligrams of nitride ions are required to prepare 820 mL of 0.330 M Ba_3N_2 solution?

PRACTICE: How many bromide ions are present in 65.5 mL of 0.210 M $GaBr_3$ solution?