

# Molarity & Empirical Formulas

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## Molarity & Empirical Formulas

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### Molarity

- Molarity is a measure of the concentration of a solution in moles of solute per liter of solution

$$\text{Molarity (M)} = \frac{\text{Moles}}{\text{liter}}$$

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### Changing the Concentration of a Solution

- Increasing Concentration
  - Increase moles of solute
    - Add more solute
  - Decrease volume
    - Evaporate/boil solvent away
- Decrease Concentration
  - Increase Volume
    - Add solvent
  - Decrease moles of solute
    - Precipitation

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### Calculating Molarity

- Steps
  - Start w/mass per volume
  - Set goal at moles per liter (this is molarity)
  - Make conversions
- What is the molarity of a solution created by dissolving 7.2 grams calcium chloride in enough water to make 500.0 ml?

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### Using Molarity as a Conversion Factor

- How many grams of NaOH are contained in 250 ml of 0.250M NaOH.

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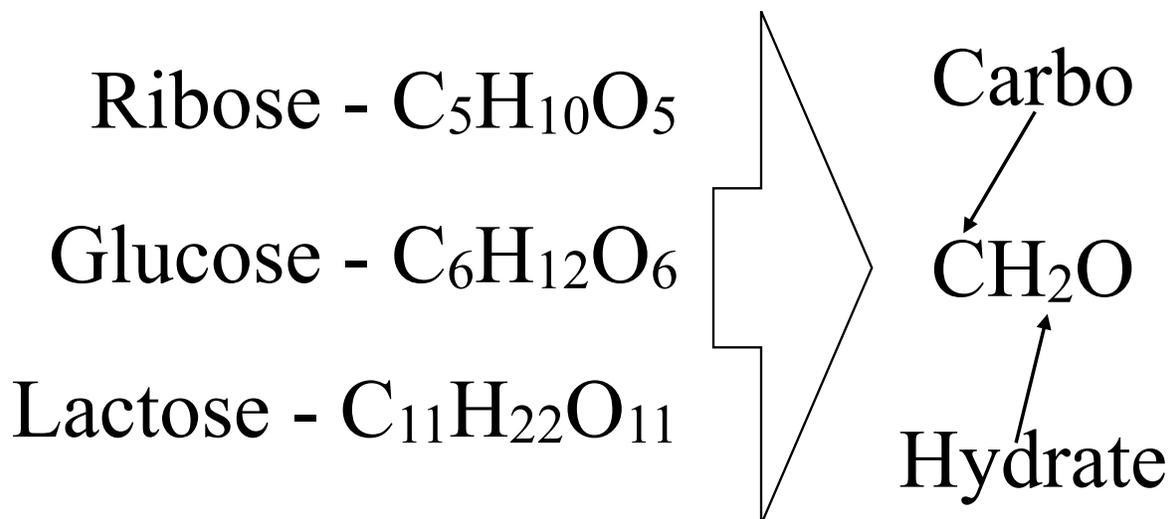
### Empirical Formulas

- Empirical Formulas
  - The simplest formula for a compound

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### Empirical Formulas



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### Empirical Formulas

- Steps for calculating empirical formulas
  - Use %'s as masses if need
  - Convert to moles
  - Divide by smallest number of moles
  - Write empirical formula

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### Empirical Formulas

- A compound contains 33.3% Ca, 40.0% O and 26.7 % Sulfur.  
What is the empirical formula for the compound?