## Molarity (M)

Molarity = \( \frac{\text{moles of solute}}{\text{liter of solution}} \)

Solve the problems below.

1. What is the molarity of a solution in which 58 g of NaCl are dissolved in 1.0 L of solution?

2. What is the molarity of a solution in which 10.0 g of AgNO₃ is dissolved in 500. mL of solution?

3. How many grams of KNO₃ should be used to prepare 2.00 L of a 0.500 M solution?

4. To what volume should 5.0 g of KCl be diluted in order to prepare a 0.25 M solution?

5. How many grams of CuSO₄ • 5H₂O are needed to prepare 100. mL of a 0.10 M solution?
MOLARITY BY DILUTION

Acids are usually acquired from chemical supply houses in concentrated form. These acids are diluted to the desired concentration by adding water. Since moles of acid before dilution = moles of acid after dilution, and moles of acid = M x V then, \( M_1 \times V_1 = M_2 \times V_2 \). Solve the following problems.

1. How much concentrated 18 M sulfuric acid is needed to prepare 250 mL of a 6.0 M solution?

2. How much concentrated 12 M hydrochloric acid is needed to prepare 100 mL of a 2.0 M solution?

3. To what volume should 25 mL of 15 M nitric acid be diluted to prepare a 3.0 M solution?

4. To how much water should 50. mL of 12 M hydrochloric acid be added to produce a 4.0 M solution?

5. To how much water should 100. mL of 18 M sulfuric acid be added to prepare a 1.5 M solution?