

Chemistry 2, HW 13

Concentration refers to the amount of a substance (solute) present in a certain volume of solution. It is commonly expressed in terms like molarity (M), which is defined as the number of moles of solute per liter of solution.

What is a 1 Molar (1 M) Solution?

A **1 molar solution** contains exactly **1 mole of solute dissolved in 1 liter (L) of solution**.

- **Mole:** A mole is a measure of quantity in chemistry, equivalent to 6.022×10^{23} particles (atoms, molecules, ions, etc.).
- **Molar mass:** The mass of one mole of a substance is determined by the atomic or molecular weight, usually found on the periodic table.

How to Make a 1 Molar Solution

1. **Determine the Molar Mass of the Solute:** Look up the molar mass of the solute (e.g., NaCl has a molar mass of 58.44 g/mol).
2. **Measure the Solute:** Weigh out the exact mass corresponding to 1 mole of the solute. For example:
 - 1 mol NaCl=58.44 g
3. **Dissolve the Solute:**
 - Add the solute to a beaker or flask.
 - Add distilled water, up to 1 L
 - You will get 1 M solution of sodium chloride.

Questions:

1. How to prepare 0.5 M solution of NaCl.
2. How to prepare 1 M solution of MgCl_2 , the final volume of the solution should be 100 ml.
3. How to prepare 2M solution of Na_2SO_4 in 4 liters.