How to Calculate the Molar Mass of a Chemical Compound

Calculating the molar mass of a chemical compound involves adding up the atomic masses of all the atoms in the compound's molecular formula. Here's how to do it step by step:

Steps to Calculate Molar Mass

1. Identify the Chemical Formula: Determine the molecular formula of the compound. For example, for water, the chemical formula is H2O.

2. List Each Element's Atomic Mass: Refer to the periodic table for the atomic mass of each element in the compound. Atomic masses are usually given in atomic mass units (amu) or grams per mole (g/mol).

3. Count the Atoms of Each Element: In the molecular formula, identify how many atoms of each element the compound contains.

4. Multiply and Add:
   - Multiply the atomic mass of each element by the number of atoms of that element in the formula.
   - Add the results from each element together to get the total molar mass of the compound.

Example Calculation: Water (H_2O)

1. Formula: H2O
2. Atomic Masses:
   - Hydrogen (H) ≈ 1.008 g/mol
   - Oxygen (O) ≈ 16.00 g/mol
3. Count of Atoms:
   - 2 atoms of Hydrogen
   - 1 atom of Oxygen
4. Calculation:
   - Total mass for Hydrogen = 2 x 1.008 g/mol = 2.016 g/mol
   - Total mass for Oxygen = 1 x 16.00 g/mol = 16.00 g/mol
   - Molar mass of H2O = 2.016 g/mol + 16.00 g/mol = 18.016 g/mol

This final sum, 18.016 g/mol, is the molar mass of water. Each step is crucial for accurately calculating the molar mass, and care must be taken with the atomic masses and the count of each atom in the formula.