

Chemistry Chapter 11

1. **Avogadro's Number:** the number 6.022×10^{23} , which is the number of representative particles in a mole, and can be rounded to three significant digits: 6.02×10^{23} .
2. **Empirical Formula:** a formula that shows the smallest whole-number mole ratio of the elements of a compound, and may or may not be the same as the actual molecular formula.
3. **Hydrate:** a compound that has a specific number of water molecules bound to its atom.
4. **Molar Mass:** the mass in grams of the mole of any pure substance.
5. **Mole:** the SI base unit used to measure the amount of a substance, abbreviated mol; one mole is the amount of a pure substance that contains 6.02×10^{23} representative particles.
6. **Molecular Formula:** a formula that specifies the actual number of atoms of each element in one molecule or formula unit of the substance.
7. **Percent Composition:** the percent by mass of each element in a compound.

Key Equations

$$\text{Number of representative particles} = \frac{(\text{number of moles})}{1} \frac{(6.02 \times 10^{23} \text{ representative particles})}{(1 \text{ mole})}$$

$$\text{Number of moles} = \frac{(\text{number of representative particles})}{1} \frac{(1 \text{ mole})}{(6.02 \times 10^{23} \text{ representative particles})}$$

$$\text{Mass} = \frac{(\text{number of moles})}{1} \frac{(\text{number of grams})}{(1 \text{ mole})}$$

$$\text{Number of moles} = \frac{(\text{mass})}{(\text{number of grams})} \frac{(1 \text{ mole})}{1}$$

$$\text{Percent by mass} = \frac{(\text{mass of element})}{(\text{mass of compound})} \times 100\%$$

$$\text{Molecular formula} = (\text{empirical formula})_n$$