Molar Mass

Morgan Benavidez

August 28th, 2022

1   Definitions

Molar Mass - Mass of 1 mole of a substance. Units are $\frac{grams}{mole}$.

Molecular Compound - Atoms linked together by sharing electrons. Bind together in electrically neutral particles called molecules. The attraction of atoms is called covalent bonding.

Ionic Compound - Formed due to the transfer of electrons. Usually when metals react or bond with non-metals. They are held together by electrical attraction.

Avogadro's Number - 6.022 x 10^{23} of molecules (molecular compound) or formula units (ionic compound). Equal to 1 mole.

$$1 \text{ mol} = 6.022 * 10^{23} \tag{1}$$

Relative Atomic Mass - Also called atomic weight. Usually in the top right corner of box on periodic table or under elemental abbreviation. It is the average of the atomic masses of all the different naturally occurring isotopes of each element. Each different isotope is weighted by the abundance of those isotopes on Earth. *This means that extraterrestrial objects, like asteroid, meteors, other planets might have very different isotope abundances.*

2   Examples of Finding Molar Mass

2.1   Find the molar mass of sodium carbonate:

$$Na_2CO_3 \tag{2}$$

$$Na, 2 * 22.990 = 45.98 \tag{3}$$

$$C, 1 * 12.011 = 12.011 \tag{4}$$

$$O, 3 * 15.999 = 47.997 \tag{5}$$

$$\text{Molar Mass} = 45.98 + 12.011 + 47.997 \tag{6}$$

$$\text{Molar Mass} = 105.988 \frac{grams}{mole} \tag{7}$$

2.2 Find the molar mass of calcium nitrate:

$$Ca(NO_3)_2 \tag{8}$$

$$Ca, 1 * 40.078 = 40.078 \tag{9}$$

$$N, 2 * 14.007 = 28.014 \tag{10}$$

$$O, 6 * 15.999 = 95.994 \tag{11}$$

$$\text{Molar Mass} = 40.078 + 28.014 + 95.994 \tag{12}$$

$$\text{Molar Mass} = 164.086 \frac{grams}{mole} \tag{13}$$