

September 10th, 2018

Chapter 1

Dimensional Analysis

An approach to help us keep track of units.

How to: Express conversion factors as fractions.

Example:

$$1 \text{ kg} = 2.2046 \text{ lb}$$

becomes:

$$\frac{1 \text{ kg}}{2.2046 \text{ lb}} \quad \text{or} \quad \frac{2.2046 \text{ lb}}{1 \text{ kg}}$$

Exact vs Inexact numbers. 1 kg in conversion factor is exact, 2.2046 is inexact.

Chapter 2

Atom: From atomos (Greek) meaning uncuttable or indivisible.

John Dalton developed Atomic Theory which linked the idea of elements to the idea of atoms.

1. Each element is composed of extremely small particles called atoms
2. All atoms of a given element are identical. Atoms of one element are unique when compared to atoms of all other elements.
3. Atoms of one element cannot be changed into atoms of a different element by chemical reactions.

Corollary: **Law of Conservation of Mass:** atoms are neither created nor destroyed in a chemical reaction.

4. **Law of Constant Composition** Compounds are formed when atoms of more than one element combine. A given compound always has the same relative number and kinds of atoms.

Dalton's theory explained known facts and predicted new ones. He deduced the law of multiple proportions: If two elements A and B combine to form more than one compound, then the masses of B that can combine with a given mass of A are in the ratio of small whole numbers.

Two Elements (A and B) can combine to form more than one compound, then the masses of B that can combine with a given mass of A are in ratios of small whole numbers