CHEM STUDY GUIDE:

Chapters 1-9

Chapter 2: Atoms, Molecules, and Atoms

Section 1: Early Ideas in Atomic Theory

- · Atomic Theory in the 19th Century
 - The first discussion of the structure of matter stated that matter was composed of small, finite particles called atoms
 - o Dalton's Atomic Theory:
 - Matter is composed of exceedingly small particles called atoms. An atom
 is the smallest unit of an element that can participate in a chemical change.
 - An element consists of only one type of atom, which has a mass that is characteristic of the element and is the same for all atoms of that element. A macroscopic sample of an element contains an incredibly large number of atoms, all of which have identical chemical properties.
 - Atoms of one element differ in properties from atoms of all other elements.
 - A compound consists of atoms of two or more elements combined in a small, whole-number ratio. In a given compound, the numbers of atoms of each of its elements are always present in the same ratio.
 - Atoms are neither created nor destroyed during a chemical change, but are instead rearranged to yield substances that are different from those present before the change
 - The theory provided a microscopic explanation for many macroscopic properties
 - Law of Definite Proportions/ Law of Constant Composition- all samples of a pure compound contain the same elements in the same proportions by mass
 - Law of Multiple Proportions- when two elements react to form more than one compound, a fixed mass of one element will react with masses of the other element in a ratio of small whole numbers

Section 2: Evolution of Atomic Theory

- Atomic Theory After the 19th Century
 - J.J. Thompson- Cathode Ray Tube
 - Sealed glass tube with two metal electrodes
 - When a high voltage was applied across the electrodes, a visible beam called a cathode ray appeared between the electrodes

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