**Notes 9/10/18**

Unit 1 – Atomic Structure

Chapter 3 Atoms: the Building Blocks of Matter

An **atom** is the smallest particle of an element that retains the chemical properties of that element.

3.1 The atom: from philosophical idea to scientific theory

I. Foundations of atomic theory

A. The law of conservation of mass states that mass is neither destroyed nor created during ordinary chemical or physical reactions.

B. The law of definite proportions states that a chemical compound contains the same elements in exactly the same proportions by mass regardless of the size of the sample or source of the compound.

C. The law of multiple proportions states that if two or more different compounds are composed of the same two elements, then the ratio of the masses of the second element combined with a certain mass of the first element is always a ratio of small whole numbers.

II. Atomic Theory

A. Modern Atomic Theory

1. All matter is made up of very tiny particles called atoms.

2. Atoms of the same element are chemically alike.

3. Individual atoms of an element may not all have the same mass. However, the atoms of an element have a definite average mass that is characteristic of the element

4. Atoms of different elements have different average masses.

5. Atoms are not subdivided, created, or destroyed in chemical reactions.