

Name: _____
Blk: _____ Date: _____

Science 9 Notes: Atomic Theory

Early ideas about matter

Greek philosophers believed that matter was made of **atomos** that were the smallest pieces of matter.

Aristotle believed matter was made of different combinations of **earth, air, fire, and water.**

Alchemists experimented with matter and tried to turn common metals into **gold.**

Their activities marked the beginning of our understanding of matter.

Development of Atomic Theory I

John Dalton (1766 - 1844)

The Billiard Ball Model

matter is made of small, **hard spheres** that are different for different elements

Dalton's Atomic Theory

All matter is made of small particles called **atoms.**

Atoms cannot be created, destroyed, or divided into smaller particles.

All atoms of the same element are **identical** in mass and size, but they are different in mass and size from the atoms of other elements.

Compounds are created when atoms of different elements link together in definite proportions.

Atomic Theory II

J. J. Thomson (1856 - 1940)

The Raisin Bun Model

This model is best visualized as a **positively charged** bun with **negatively charged** particles spread out in it like raisins.

Atomic Theory III

Ernest Rutherford (1871 - 1937)

The Planetary Model

He suggested that the deflection of the charged particles was because the atom contained a tiny dense centre called a **nucleus**, and negatively charged **electrons** moved around the nucleus.

Atomic Theory IV

Niels Bohr (1885 - 1962)

The Bohr Model

Based on his observations, Bohr proposed that negatively charged electrons surround the positively charged nucleus, containing **protons and neutrons**, in specific **"energy levels"** or **"shells"**

In science 9 we will use the Bohr Model to represent the atom (although the best understood model of the atom is known as the **Quantum Mechanic Model**, which you will learn in Chemistry 11)

Inside the Atom

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

All atoms are made up of three kinds of particles called **subatomic particles**. These particles are:

- 1. Electrons** – **negatively** charged particles found **outside** the nucleus of the atom
- 2. Protons** – **positively** charged particles found **inside** the nucleus
- 3. Neutrons** – **neutrally** charged particles (no charge) found **inside** the nucleus.

Mass

The mass of the atom is determined by the number of subatomic particles found in the NUCLEUS (therefore the total number of **protons and neutrons**)