

Chapter 4 Objectives

Understand the correct meaning and usage for each of the following terms: element, compound, atom, Law of Conservation of Matter, proton, neutron, electron, nucleus, atomic number, mass number, isotope, ionic charge, metal, non-metal, metalloid, period, group, family, alkali elements, alkaline earth elements, halogens, noble gases.

Dalton's Atomic Theory and give its historical context.

Describe the nuclear atom including the locations, charges, and relative masses of the subatomic particles.

Determine the numbers of subatomic particles for an atom or ion if given its mass number and charge. Identify the mass number and charge if given the numbers of subatomic particles.

Write complete atomic symbols for atoms or ions.

Label the parts of the periodic table.

Identify elements as being metals, non-metals, or semi-metals.

Differentiate among atoms, ions, and molecules.

Determine the valence of an element and the charge of common monatomic ions based on their position on the periodic table.

Explain the difference between the atomic mass (weight) and the mass number.

If given the masses of isotopes and their abundance, calculate the atomic weight of an element.

Chapter Four Outline

Dalton's Atomic Theory

- The assumptions of Daltons theory

- When Dalton's theory works and when it doesn't

Simplified modern atomic theory

- The nucleus

 - Protons

 - Neutrons

- The shells—the electrons

Characteristics of a particular atom

- Atomic number and the element identity

- Mass number and the isotope

- Charge and the ion

- Atomic mass as an average

Periodic law part 1

Groups, families, and periods

Types of elements

Metals

Non-metals

Semimetals or metalloids

Some periodic properties, especially ionic charges

Homework: Work problems 51, 65, 71, 75, 89, 93, and 113. Problems 85, 105, and 109 may be worked for extra credit.