

Chemistry Chapter 1 Section 1:

Objective 1: Define Chemistry

Chemistry is the study of the composition, structure, and properties of matter and the changes it undergoes, traditionally a physical science. Since all living and nonliving things have a chemical make up, chemistry is considered central to all science.

Objective 2: List The Branches of Chemistry.

- A. Organic - Chemistry of substances containing carbon
- B. Inorganic Chemistry Study of things classified as not organic
- C. Physical Chemistry The study of properties and changes of matter and their relationship to energy.
- D. Analytical Chemistry: Identification of components and composition of materials
- E. Biological Chemistry Study of substance and the process occurring in living things.
- F. Theoretical Chemistry: Use of mathematics and computers to understand the principle behind observed chemical behavior and to design the properties of new compounds.

Objective 3: Compare and contrast the three types of Research.

- A. Basic Research is for the sake of increasing knowledge and includes chance discoveries; Examples discovery of fiber optics, Teflon, polyethylene
- B. Applied Research is research done to solve a problem; Example: working for Firestone to improve tire wear.
- C. Technological development: Products that improve quality of life; Example: Microwave oven. Technological development Lag behind Research discoveries

Chemistry Chapter 1 Section 2

Vocabulary:

- 1) **Mass** is the measure of the amount of matter.
- 2) **Matter** is anything that has mass and takes up space.
- 3) An **atom** is the smallest unit of an element that has the properties of that element.
- 4) An **element** is a pure substance made of only one type kind of atom.
- 5) A **compound** is a substance that is made from the atoms of two or more elements that are chemically bonded.
- 6) **Extensive properties** depend on the amount of matter present. (mass
- 7) **Intensive properties** do not depend on the amount of matter present. (melting point, density...)

Objective 1.2.1: Distinguish between the chemical and physical properties of matter.

CHEMICAL PROPERTY relates to a substance's ability to undergo chemical changes that **transform it into a different substance. This is a rearrangement of the atoms**

Examples: flammability, reaction with water, or anything else that has to do with one substance changing into another different substance.

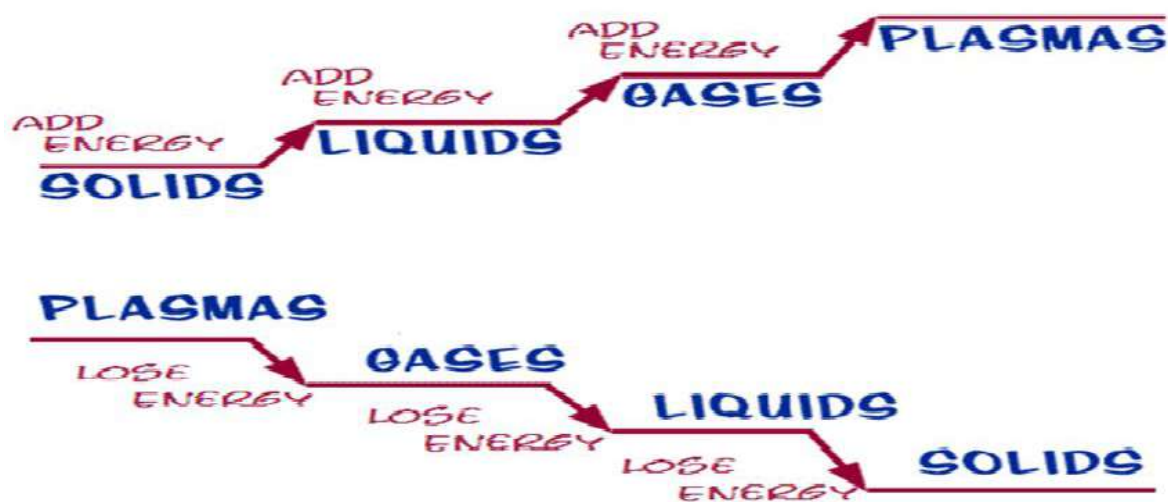
A PHYSICAL PROPERTY is a characteristic that can be **observed or measured without changing the identity of the substance. This is not a rearrangement of the atoms**

Examples: color, shape, and density are physical properties.

A change in state is a physical change of a substance from one state to another state.

The **four** main **STATES** of matter are

SOLIDS, LIQUIDS, GASES, and PLASMAS.



Objective 1.2.2: Classify changes of matter as a physical change or chemical change.

A physical change **is any change that the substance can undergo without becoming another substance.**

Example: if a pencil is broken in two then it is still wood and graphite just different size pieces.

A chemical change **occurs when the identity of a substance changes.**

Example: when lighter fluid is burned it changes from a clear liquid to gaseous water and carbon dioxide or when iron corrodes it mixes with other elements (mostly oxygen)

When a chemical change occurs, the atoms that make up the substance are rearranged to form a new compound.

Objective 1.2.3: Explain solid, liquid and gas states in terms of particles

Solid	Liquid	Gas	Plasma
Particles do not move around, They Vibrate Particles are very closely packed together. Definite Shape and Volume	Particles move around AND vibrate. Particles are packed together. Definite Volume but NO Definite Shape	Particles move / Fly around quickly; Particles are far apart and move in all Directions No Definite Volume or Shape	High temperature physical state of matter in which atoms lose their electrons

Objective 1.2.4 Distinguish between a mixture and a pure substance. Page 15 in text

		Matter	
		Can it be separated?	
YES <i>Mixture</i>		NO <i>Pure substances</i>	
Is the composition uniform?		Can it be decomposed by ordinary chemical means?	
YES	NO	YES	NO
Homogeneous mixtures (air, sugar in water, stainless steel)	Heterogeneous mixtures (granite, wood, blood)	Compounds (water, sodium chloride, sucrose)	Elements (gold, aluminum, oxygen, chlorine)

HOMEWORK: Page 26 #'s 1 – 13; 16, 17, 19, 22, and 24
(note: #'s 1 – 24 will all be homework)

Chemistry Chapter 1 Section 3

Vocabulary:

- 1) **Groups or Families are the vertical (up and down) columns of the periodic table.**
- 2) **Periods are the horizontal (across) rows of the periodic table.**
- 3) **The Noble Gas Group is the last (18th) group of the periodic table. Its members are very unreactive.**

Objective 1.3.1 and 1.3.2: Look up the symbol or name of an element using the periodic table.

The periodic table is a chart of all the known **elements in increasing order of atomic number (the # of protons in the nucleus).**

The **element's symbol is used** instead of the full name though the full name is usually printed under the symbol.

Objective 1.3.3: Describe the arrangement of the periodic table.

When the **elements are arranged in order by their atomic number, a pattern of properties forms across the periods.**

This pattern causes the **groups to have elements with similar properties.**

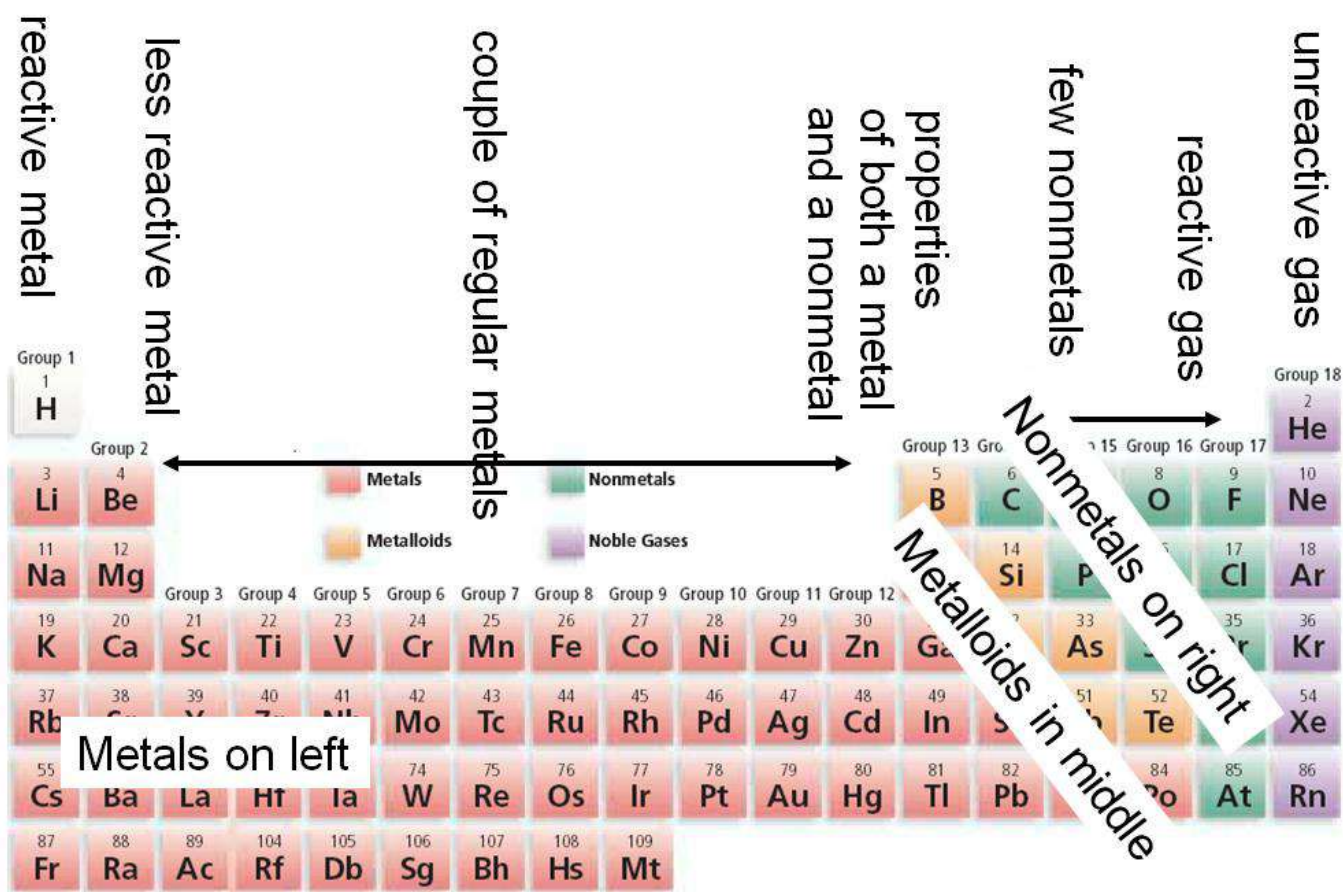
For example, a reactive metal, then a less active metal, then a couple of regular metals, followed by metalloids, then a few nonmetals, then a reactive gas, and last in the pattern is an unreactive gas. See diagram next page

Objective 1.3.4: Describe the characteristics of the metals nonmetals and metalloids.

Metals conduct heat and electricity well and have luster (shiny). Ex. copper, gold

Nonmetals do not conduct heat and electricity well and are dull. Ex. carbon, sulfur

Metalloids have some properties of metals and some of nonmetals.



HOMEWORK: Page 26 #'s 15, 18, 20, 21, and 23