



## *Introduction to chemistry*

**Chemistry** is one branch of science that deals with the properties, composition, and structure of substances (elements and compounds), the transformations they undergo, and the energy that is released or absorbed during these processes , how substances interact with energy and how two or more substances are interact with each other to give a new substances.

### **The main branches of Chemistry**

- **Physical chemistry:** Physical chemistry is the study of macroscopic properties, atomic properties, and phenomena in chemical systems. A physical chemist may study such things as the rates of chemical reactions, the energy transfers that occur in reactions, or the physical structure of materials at the molecular level.
- **Organic chemistry:** Organic chemistry is the study of chemicals containing carbon with hydrogen. Carbon is one of the most abundant elements on Earth and is capable of forming a tremendously vast number of chemicals (over twenty million so far). Most of the chemicals found in all living organisms are based on carbon.
- **Inorganic chemistry:** Inorganic chemistry is the study of chemicals that do not, in general, contain carbon. Inorganic chemicals are commonly found in rocks and minerals. One current important area of inorganic

chemistry deals with the design and properties of materials involved in energy and information technology.

- **Analytical chemistry:** Analytical chemistry is the study of the composition of matter. It focuses on separating, identifying, and quantifying chemicals in samples of matter. An analytical chemist may use complex instruments to analyze an unknown material in order to determine its various components.
- **Biochemistry:** Biochemistry is the study of chemical processes that occur in living things. Research may cover basic cellular processes up to understanding disease states so better treatments can be developed.

### Law of conservation of mass

Law of conservation of mass was given by Lavoisier in 1774 . The Law of Conservation of Matter states **that matter can neither be created nor destroyed but transform from one form to other**. Because the same atoms are present in a reaction at the beginning and at the end, the amount of matter in a system does not change.

**Example 1/** Imagine you take 50 pounds of wood and burn it. You will notice and be able to relate that the weight of the ashes and emitted gases after you burn the wood is equal to 50 pounds

