

CHEM 101
Introduction to Chemistry



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Introduction: Matter & Measurement

Chemistry: is the study of the properties and behavior of matter.

Matter: is the physical material of the universe: it's anything that occupies space.

A **property** is any characteristic that allows us to recognize a particular type of matter and to distinguish it from other types.

Viscous- having a thick, sticky consistency between solid and liquid.

All matter is comprised of combinations of only about 100 substances called elements.

Molecules: two or more atoms are joined in specific shapes.

Chemistry will eventually be thought of in two realms:

- **Macroscopic**: ordinary sized objects
- **Submicroscopic**: atoms and molecules

Substances

A **pure substance** (or just substance) is matter that has distinct properties and a composition that does not vary from sample to sample.

Ex:

Water (H₂O) and Sodium (Na)

- All substances are either elements or compounds

Chapter 1

Elements are substances that cannot be decomposed into simple substances.

- On the molecular level each element is composed of only one kind of atom.

Compounds are substances composed of two or more elements.

- They contain two or more kinds of atoms.

Law of Constant Composition (Law of Definite Proportions)

- The observation that the elemental composition of a compound is always the same.

Properties of Matter

Physical Properties can be observed without changing the identity and composition of the substances.

Chemical Properties describe the way a substance may change or react, to form other substances.

Properties such as temperature and melting points are *intensive properties*.

Intensive Properties don't depend on the amount of sample being examined.
(Can be used to identify substances)

Extensive Properties depend on the amount of sample (mass and volume).
Relates to the amount of substance present.