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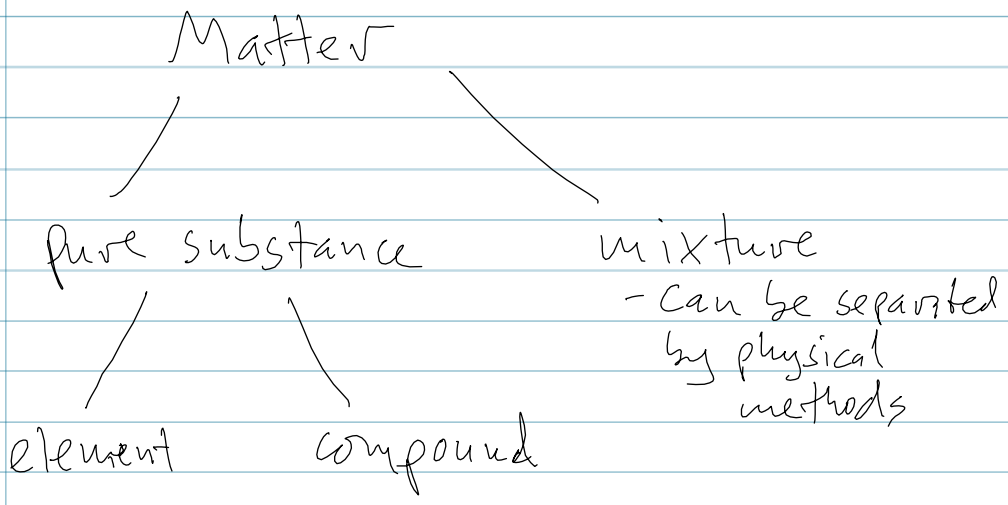
Chapter 2 - Atoms and Elements

Chemistry is the study of matter and its changes

(Sections 1-3-4): Matter



A **physical change** does not change the identity of the substance (*e.g.* boiling, melting, dissolving). For example, when water boils and makes steam, it is still the same substance (H_2O).

A **chemical change** involves a chemical reaction, which changes the identity of the substance, *e.g.* breaking water down to hydrogen and oxygen. Burning and corrosion are examples of chemical changes, because they lead to a new substance being formed.

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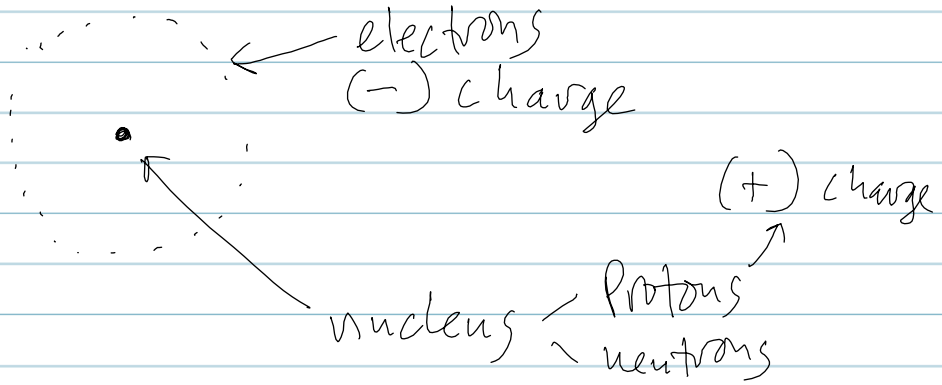
Atoms



# of electrons = # of protons (neutral atom)

Atomic number Z: The number of protons in an atom. The atomic number determines which element the atom is.

Mass Number A: Total number of protons and neutrons in an atom (we usually ignore the contribution of electrons to the total mass of an atom).

Isotopes: Atoms with the same number of protons but different numbers of neutrons. Isotopes are named by writing the mass number after the element's name.

$${}^{A}_{Z}X$$ ← Element Symbol

uranium-235

$${}^{235}_{92}U$$