

Lesson 5: Chemical Symbols, Metals and Non-Metals

Notes:

Berzelius – developed a symbolic system to identify elements using letters found in the common name or Latin name of a given element.

Rules:

1. The first letter of the element name is always a capital letter.

e.g., Nitrogen is **N**

Sulfur is **S**

Hydrogen is **H**

2. A second letter is required if the first letter is the same as another element. The second letter is always lower case.

e.g., Tin is **Sn**

Helium is **He**

Oral:

Q – Why is the symbol for Tin Sn?!

A – Sn is the symbol for the Latin name for Tin (Stannum)

- he also used these symbols to show the type and ratio of elements in a given compound.

e.g., $C_6H_{12}O_6$ Means that this compound contains 6 carbon atoms for every 12 hydrogen atoms for every 6 oxygen atoms. **Orally:** *Do a few practice here.*

Part II: Metals vs Non-Metals and Metalloids

- One of the many ways that the periodic table is organized is by metal, non-metal or Semi-metal characteristics.

Oral: *Note the staircase on the right side starting at boron and ending at astatine. This line is usually referred to simply as “the staircase” but it is properly called the semi-metal line.*

Metal properties

Table 2 Properties of Metals

Property	Characteristic
lustre	shiny
malleability	malleable (can be formed or shaped)
ductility	ductile (can be stretched into wire)
conductivity	good conductors of heat and electricity
state	solid at room temperature (except mercury, which is liquid at room temperature)
density	usually denser than non-metals
reactivity	active metals react with acid, and very active metals react with water

- Melting points and boiling points decrease down a group.
- The atoms get bigger (atomic radius) down a group.
- Density of elements increases down a group.

Non-metals properties

Table 3 Properties of Non-Metals

Property	Characteristic
lustre	dull appearance
malleability	likely to be brittle or shatter when struck
melting point and boiling point	usually lower melting and boiling points than metals
state	often gases at room temperature
conductivity	poor conductors of heat and electricity

Semi-metals (used to be called metalloids) – exhibit some properties of both metals and non-metals. e.g., an element that was a good conductor but was brittle has properties from both groups.

Assign:

Do activity on Predicting properties of alkali metals data on page 111 of text.

Worksheet: page 62 Venn diagram of metals, non-metals and semi-metals.