

# Properties of Elements

Physical properties: Features of a substance that can be observed without changing the substance itself, a physical change be reversed easily

Chemical properties: Features of the way a substance reacts with other substances, a chemical change is either impossible or very difficult to reverse

# Group 8/0

## Group 8 – The Noble Gases

- All have outside shells full of electrons so they do not react
- All have low densities

# Patterns in reactivity

## Group 1

### Group 1 – The Alkali metals

- All have one electron in the outside shell
- React in a similar way
- Get more reactive down group
- React + water forming hydroxide and hydrogen

E.g.  $\text{Lithium} + \text{water} \rightarrow \text{lithium hydroxide} + \text{hydrogen}$

Element	Reaction	Observations
Li	$\text{Lithium} + \text{water} \rightarrow \text{lithium hydroxide} + \text{hydrogen}$	Relatively slow Fizzing
Na	$\text{Sodium} + \text{water} \rightarrow \text{sodium hydroxide} + \text{hydrogen}$	Melts Flame
K	$\text{potassium} + \text{water} \rightarrow \text{potassium hydroxide} + \text{hydrogen}$	More violent Lilac flame

- React with oxygen and chlorine

E.g.  $\text{sodium} + \text{oxygen} \rightarrow \text{sodium oxide}$

## Group 7

### Group 7 – The Halogens

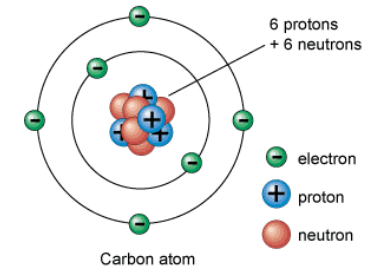
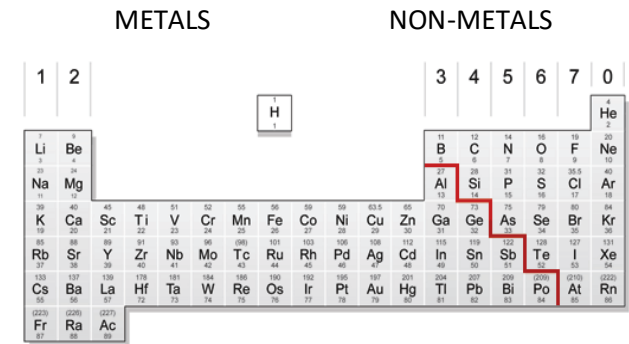
- All have seven electrons in the outside shell
- Get less reactive down group
- More reactive Group 7 elements displace less reactive ones from their compounds

E.g.  $\text{Lithium bromide} + \text{chlorine} \rightarrow \text{lithium chloride} + \text{bromine}$

Element	Properties	Uses
Cl	Green gas	Sterilising water
Br	Orange liquid	Making pesticides and plastics
I	Grey solid	Sterilising wounds

# Periodic table

The periodic table is split into columns and rows. Columns are called groups and the rows are called periods.



All elements in the same group will have the same number of outer shell electrons as the group, e.g. group 2 have 2 outer shell electrons and react in similar ways.

All elements in the same period have the same number of occupied electron shells e.g. period 3 have three occupied electron shells