

Properties of Halogen

MIGMA TSHERING

Learning Objective:

▶ Physical Properties

Physical State and Colour
Oxidation State

▶ Chemical Properties

Oxidation and Reduction
Oxidizing Agent and Reducing Agent

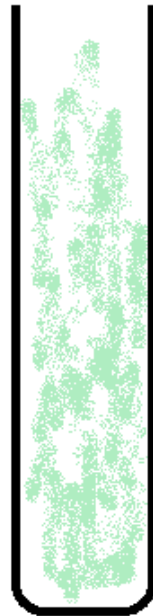
PHYSICAL PROPERTIES

Physical State and Colour



Fluorine

(g)



Chlorine

(g)



Bromine

(l)



Iodine

(s)

Oxidation State

- ▶ It is the **number** assigned to the atom
- ▶ Which represent the **number of electron(s)**
 - lost,
 - gained or
 - shared

Oxidation State: **POSITIVE**

▶ The oxidation state becomes **positive** if the atom **loses** electron(s).

▶ Example:

Oxidation state for **Na** is **+1** since it loses 1 electron.

Oxidation state for **Ca** is **+2** since it loses 2 electrons.

Oxidation State: **NEGATIVE**

▶ The oxidation state becomes **negative** if the atom **gains** electron(s)

▶ Example:

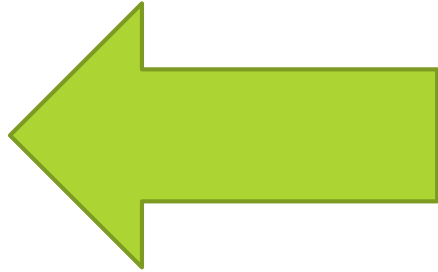
Oxidation state for **F** is **-1** since it gains 1 electron.

Oxidation state for **O** is **-2** since it gains 2 electrons.

Q1. What is the oxidation state of an atom that loses three electrons?

▶ **+3**

▶ **-3**



CHEMICAL PROPERTIES

Oxidation

- ▶ Process
- ▶ of **losing** electron(s)

Example:

Sodium undergo **OXIDATION** by **losing one electrons**



Reduction

- ▶ Process
- ▶ of gaining electron(s)

Example:

Chlorine undergo **REDUCTION** by *gaining one electrons*



Reducing Agent

- ▶ Substance
- ▶ That **helps** other substance to undergo **reduction**

Example:

Sodium **helps** other substance to undergo **reduction**
by Q2 electron(s)



Oxidizing Agent

- ▶ Substance
- ▶ That **helps** other substance to undergo **OXIDATION**

Example:

Chlorine **helps** other substance to undergo **OXIDATION**
by Q3 **electron(s)**



Reducing Agent

- ▶ Substance
- ▶ That **helps** other substance to undergo **reduction**

Example:

Sodium **helps** other substance to undergo **reduction**

by LOSING **electron(s)**



Oxidizing Agent

- ▶ Substance
- ▶ That **helps** other substance to undergo **OXIDATION**

Example:

Chlorine **helps** other substance to undergo **OXIDATION**
by **GAINING** **electron(s)**

