



BAL BHARATI PUBLIC SCHOOL, PITAMPURA, DELHI – 110034

SUBJECT: CHEMISTRY

CLASS 10

CHAPTER 1: CHEMICAL REACTIONS AND EQUATIONS

Guidelines

Dear Students

- Refer to the content below, view the links, and attempt the assignment provided at the end in your chemistry notebook.
- It would help you to read the NCERT before you begin to answer the questions.
- Link of the chapter is as follows:
<http://ncert.nic.in/textbook/textbook.htm?jesc1=1-16>

SUB TOPICS:

1. Redox reactions
2. Effects of oxidation in everyday life

1. Redox Reactions

Redox reactions are those reactions in which both oxidation and reduction occur simultaneously.

Oxidation - involves the gain of oxygen or loss of hydrogen

Reduction - involves the loss of oxygen or gain of hydrogen

Oxidation	Reduction
1. Addition of oxygen	1. Removal of oxygen
2. Removal of hydrogen	2. Addition of hydrogen
3. Loss of electrons	3. Gain of electrons

Example 1: When **Oxygen** is involved:



In this reaction, zinc oxide is reduced to zinc due to loss of oxygen.

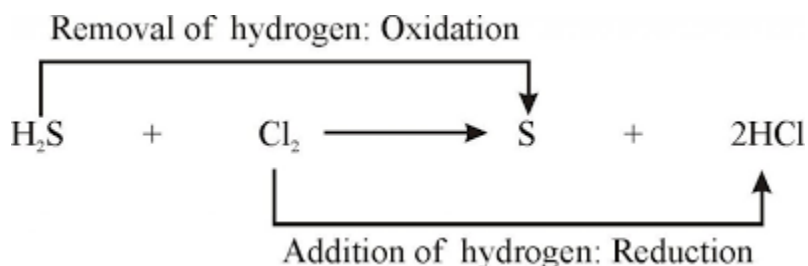
Carbon is oxidized to carbon monoxide due to gain of oxygen.

When **Oxygen** is **NOT** involved:

- Oxidation is also considered as LOSS of HYDROGEN

- Reduction is also considered as GAIN of HYDROGEN
- REMEMBER they are OPPOSITE PROCESSES

Example 2:

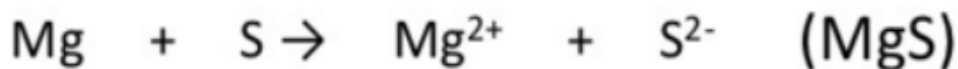


- **OXIDATION** and **REDUCTION** always occur simultaneously
- **OXIDIZED** substance gains oxygen OR loses hydrogen OR loses electrons
- **REDUCED** substance loses oxygen OR gains hydrogen OR gains electrons
- Substance that is oxidized is the **REDUCING** agent
- Substance that is reduced is the **OXIDIZING** agent

NOTE-

In redox reactions, electrons are transferred between the reactants

For Example:



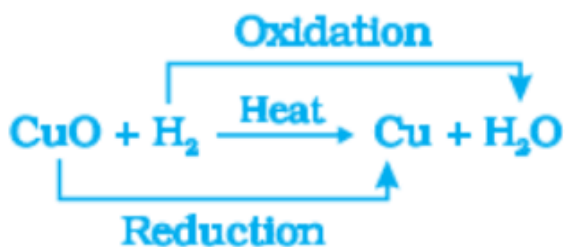
- Mg (with 0 charge) loses 2 electrons = **OXIDIZED** to Mg^{2+}
- S atom (no charge) gains 2 electrons = **REDUCED** to S^{2-}

Thus we say that in the above reaction Magnesium is oxidized (due to loss of electrons) while Sulphur is reduced (due to gain of electrons)

So, Magnesium is the reducing agent while Sulphur is the oxidizing agent.

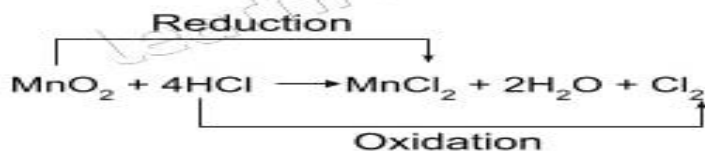
LET'S CONSIDER A FEW MORE EXAMPLES

Example 1



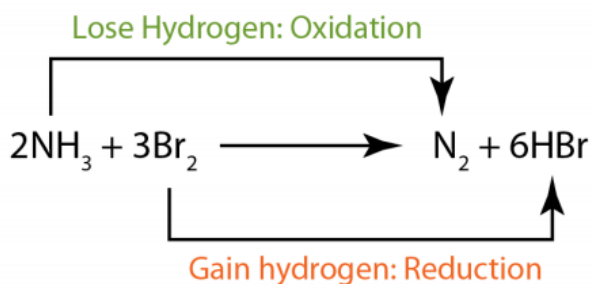
Here CuO is the Oxidizing Agent while H₂ is the reducing agent.

Example 2:



Here MnO₂ is the Oxidizing Agent while HCl is the reducing agent.

Example 3:

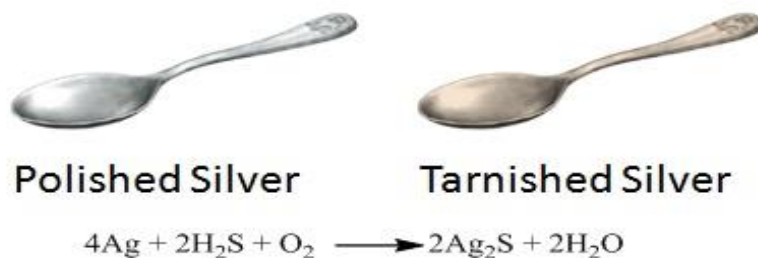


Now, identify the oxidizing agent as well as the reducing agent in the above reaction.

SUMMARY

Oxidation & reduction (redox reactions)

- If a substance gains oxygen during a reaction, it is said to be oxidised. If a substance loses oxygen during a reaction, it is said to be reduced.
- if one reactant gets oxidised while the other gets reduced during a reaction. Such reactions are called oxidation-reduction reactions or redox reactions.
- if a substance gains oxygen or loses hydrogen during a reaction, it is oxidised. If a substance loses oxygen or gains hydrogen during a reaction, it is reduced.



b) Rancidity

It is generally observed that when oily food items are kept for a long time, they start to smell very bad. This happens because the fats and oils get oxidised and hence they become rancid that changes their taste and smell.

To avoid such spoilage, antioxidants are added to oily food items. Food items can also be prevented from getting oxidised by keeping them in air tight packets.

Due to this reason packets of chips are flushed with gas such as **nitrogen** that acts as antioxidant and prevents spoilage of the fried chips.



ASSIGNMENT:

Q1. Identify the **oxidising agent** as well as the **reducing agent** in the following reactions:

- (a) $4\text{NH}_3 + 5\text{O}_2 \longrightarrow 4\text{NO} + 6\text{H}_2\text{O}$
- (b) $\text{V}_2\text{O}_5 + 5\text{Ca} \longrightarrow 2\text{V} + 5\text{CaO}$
- (c) $\text{Fe}_2\text{O}_3 + 3\text{CO} \longrightarrow 2\text{Fe} + 3\text{CO}_2$
- (d) $2\text{H}_2 + \text{O}_2 \longrightarrow 2\text{H}_2\text{O}$
- (e) $\text{Pb}_3\text{O}_4 + 8\text{HCl} \longrightarrow 3\text{PbCl}_2 + \text{Cl}_2 + 4\text{H}_2\text{O}$

Q2. A silver article generally turns black when kept in the open for a few days.

- (a) Why do silver articles turn black when kept in the open for a few days? Name the phenomenon involved.
- (b) Name the black substance formed and give its chemical formula.

Q3. What is meant by rancidity? How can it be prevented?
