SAI International School
Lesson Notes
Subject - Chemistry
Ch-Chemical Reactions and Equations
Topic-Corrosion & Rancidity
Module - 5 Dt_31/3/2020

Suggested Videos- https://youtu.be/Kbkx-SdMCtY
https://youtu.be/DycJXcFdQ1Y

To be done in CW Copy-

Examples of OXIDATION-

CORROSIONRANCIDITY

The **wearing out of metals layer by layer,** due to their **reaction with atmospheric** present in **food items** to give **gases**,in presence of **moisture,is known**out a**foul smell and bitter as Corrosion. taste is known as Rancidity.**

The **oxidation of fats and Oil**

- **CORROSION-**

Corrosion may be of two types:

1.Positive Corrosion2.Negative Corrosion

This phenomenon protects the metal from further corrosion
Example- Corrosion of Al, Mg, Zn

This phenomenon destroys the metal gradually or makes the surface dull & lustre less.
Example- a. Rusting of Fe,
b. Tarnishing of Ag,
c. Corrosion of Cu.

1. **Positive Corrosion-**
   Metals like **Al, Mg, & Zn** being reactive in nature, react readily with atmospheric gases like **Oxygen & Carbon-dioxide**in presence of **moisture**, to form a **sticky layer** of the corresponding **metal oxide/carbonate,** which **acts as a protective coat & prevents the metal from further exposure to air & moisture (Corrosion).**

   Application- a. Galvanizing of iron using Zn.
   b.Al is used to make door & window frames, Chairs, Utensils,

c. Mg is used in the form of its alloy to make parts of space crafts, vehicles etc.

2. **Negative Corrosion-**

a. Corrosion of Iron-

Iron reacts with **atmospheric moisture & oxygen** to form **hydrated ferricoxide** which is a **flaky substance and falls off readily**. So the **inner layers** of the metal are exposed to **further corrosion** and gradually it gets destroyed.

This process is known as **RUSTING of IRON**.

$$Fe + O2 \xrightarrow{----H2O-} Fe2O3.xH2O$$

Iron **air** **RUST (hydrated ferric oxide)**

b. Corrosion of Silver-

Silver reacts with **atmospheric Hydrogen Sulphide** , in **presence of moisture** to form a **black layer Silver Sulphide**.

This process is known as **Tarnishing of Silver.**

$$Ag + H_2S \xrightarrow{----H_2O----} Ag_2S$$

Silver **hydrogen sulphide** **Black Silver sulphide**

c. Corrosion of Copper-

Copper reacts with **atmospheric carbon-dioxide and moisture** to form a **green deposits** of **hydrated copper carbonate.**

This process is known as **Tarnishing of Copper.**

$$2Cu + H_2O + CO_2 + O_2 \longrightarrow Cu(CO)_3.Cu(OH)_2$$

Green hydrated copper carbonate

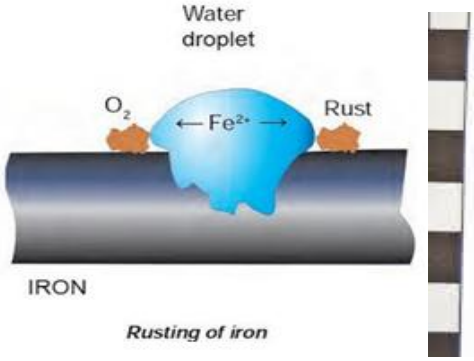

Fig. Rusting of IRONFig. Tarnishing of Copper

3. **Conditions necessary for corrosion-**

The conditions necessary for corrosion are-

a. Presence of moisture.

b. Presence of atmospheric gases like-
Oxygen, Carbon-dioxide, Sulphur dioxide, Hydrogen sulphide, etc.
c. Presence of corrosive material.

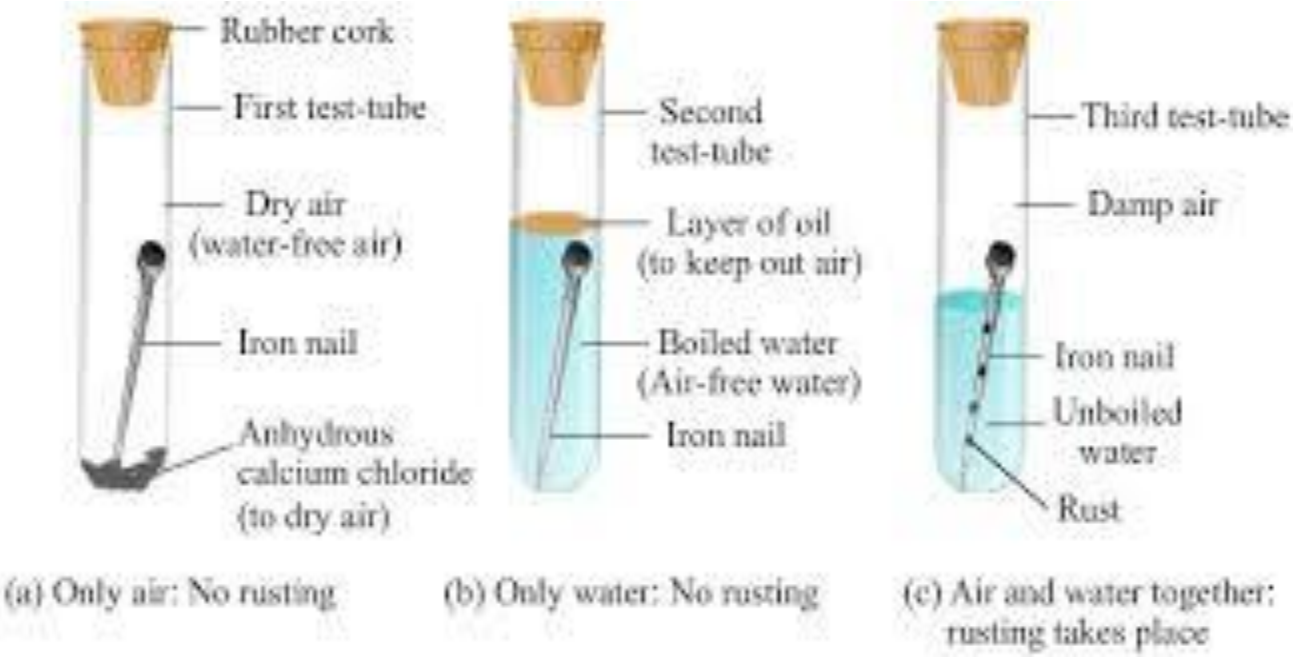

Fig. Experiment to show that air & moisture are necessary for corrosion.

4. **<u>Prevention of Corrosion-</u>**
Corrosion can be prevented by various methods where, the metal is prevented from coming in contact with air & moisture or by Alloying.

Methods of preventing Corrosion-

a. **Painting**
b. **Greasing.**
c. **Galvanizing**
d. **Electroplating**
e. **Alloying.**
f. **Anodizing.**

- **<u>RANCIDITY</u>-**
When the **substance containing oils and fats** are **exposed to air** they get oxidized and become **rancid** due to which their **smell, taste and colourchange**. This process is known as **Rancidity.**

Fig. Fresh oil & Rancid oil **Fig. Rancid Pizza**

Example-

a. When butter is kept open for a long time then its smell and tastechanges. This butter is known as **Rancid Butter**.
b. Fried chips & snacks acquire a foul smell & a bitter taste when left exposed to air for a long time.
c. When Pizza/bread is left exposed to air for a longer period, it develops molds and turns Rancid.

Methods of preventing Rancidity-

a. Adding antioxidants (substances which prevent oxidation) to food.
b. Storing food in airtight containers to slow the process of rancidification.
c. Refrigerating food also helps to slow down rancidification.
d. Flushing food packets with Nitrogen (inert gas at room temperature) before sealing.

Fig. Storing food in airtight containers **Fig. Food packets flushed with Nitrogen**

Assessment

MCQs

- ***For Assertion& Reason question follow the following directions.***

DIRECTION:*Each of these questions contains an Assertion followed by Reason. Read them carefully and answer the question on the basis of following options. You have to select the one that best describes the two statements.*
(a) If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.
(c) If Assertion is correct but Reason is incorrect.
(d) If Assertion is incorrect but Reason is correct.
(e) If Assertion & Reason both are incorrect.

Q.1 Assertion : Corrosion of iron is commonly known asrusting.

Reason : Corrosion of iron occurs in presence of water and air.

Q.2 Assertion: Aluminium utensils does not corrode at all.

Reason: Aluminium forms a protective oxide layer which prevents further corrosion of Aluminium.

Home assignment

Q.1 People use plastic containers in place of Iron, in costal areas.Why?

Q.2 Why do we apply paint on iron articles?

Q.3 Oil and fat containing food items are flushed with nitrogen. Why?

Q.4 Explain the following terms with one example each. (a) Corrosion (b) Rancidity

Q.5 Give reason for the following :-

(a) Bags of chips are flushed with nitrogen gas.

(b) Iron articles are shiny when new, but get coated with reddish brown powder when left for some time.

(c) When water is added to calcium oxide in a beaker, the beaker becomes hotter.

Q.6 Silver Articles develops black coating & copper articles develops green coating. Which chemical phenomenon is involved in this change ? Give the chemical name & composition of the compounds formed in each case.