## **Rusting and its Prevention**

The process of deposition of a reddish-brown layer on the surface of iron is called **rusting**. In this process, a new substance is formed.

When articles made of iron come in contact with moisture present in the air, they get rusted.

Iron is converted into iron oxide, i.e. rust. The chemical structures of rust and iron are completely different. Rust is iron oxide. Iron is a grey-black material while rust is reddish brown.

The Chemical reaction describing rusting is,

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Iron	+	Oxygen	+	Water	>	Hydrated iron oxide
4Fe	+	<b>30</b> <sub>2</sub>	х	H <sub>2</sub> O	>	$2Fe_2O_3 \times H_2O$

## Conditions under which rusting takes place

- Iron does not rusting dry air. Iron does not rust in oxygen- free pure water. Iron needs both **oxygen and water** for rusting.
- The presence of acidic gases such as oxides of sulphur, nitrogen and carbon dioxide in air increases the rate of rusting.
- The presence of salts in water also increases the rate of rusting. That is why ships, cooler body, etc. show rapid rusting.

## Prevention of Rusting

Some commonly used methods for the prevention of rusting are:

**1. By applying pain or grease/oil:** A coating of paint or grease /oil on the surface of a metallic object prevents its corrosion by not allowing moist air to come in contact with the surface.

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**2. By galvanisation:** Coating of an iron object with a thin layer of zinc is called galvanisation. Galvanisation of iron prevents its rusting. Galvanised iron sheets are used for roofing and for making buckets, drums, etc.

**3. By electroplating corrosion-resistant metals**: Corrosion of metals can be prevented by electroplating any corrosion-resistant metal such as nickel, chromium, etc. on them. Chromium or nickel coating prevents rusting of auto parts, bathroom fittings (taps, showers), etc.

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**4. By tinning:** Tin is a corrosion- resistant and non -toxic metals. Therefore, tin is used for making containers or utensils of iron, brass and copper safe for storing foodstuffs.

**5.** By alloying: Certain metals can be made corrosion-resistant when alloyed with other metals. For example, stainless steel which is corrosion- resistant, is made by allowing iron with nickel and chromium.

**6.** By cathodic protection: Preventing the corrosion of a metal by connecting it to a more reactive metal is called cathodic protection of metal. For example, when iron is connected to a piece of magnesium, it does not get corroded as long as magnesium is present.