

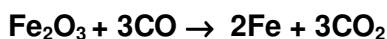
Name : \_\_\_\_\_ ( ) Class: \_\_\_\_\_ Date : \_\_\_\_\_

### Processes that involve redox reaction

#### 1. *Extraction of metals.*

Metals are extracted from their ores by reduction.

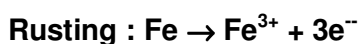
Iron is extracted from iron(III) oxide in the blast furnace by the reaction



In the reaction,

- the  $\text{Fe}_2\text{O}_3$  is **reduced** because it **loses** oxygen;
- the CO is **oxidised** because it **gains** oxygen;
- the CO is the **reducing** agent as it **removes** oxygen from the  $\text{Fe}_2\text{O}_3$ ;
- the  $\text{Fe}_2\text{O}_3$  is the **oxidising** agent because it **gives/donates** oxygen to the CO.

#### 2. *Rusting of iron and steel.*

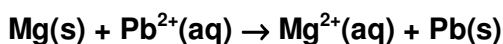


The rusting of iron is oxidation, because the iron atoms **loses** electrons to become  $\text{Fe}^{3+}$  ions in rust.

#### 3. *Displacement reactions of metals.*

The displacement of a less reactive metal from its aqueous salt by a more reactive metal is a redox (reduction-oxidation) reaction.

For example, magnesium displaces lead from a solution of lead(II) nitrate. The ionic equation is :



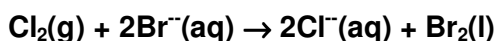
In this reaction,

- the Mg atoms are **oxidised** because they **lose** electrons to become  $\text{Mg}^{2+}$  ions;
- the  $\text{Pb}^{2+}$  ions are **reduced** because they **gain** electrons to become Pb atoms;
- the  $\text{Pb}^{2+}$  is the **oxidising** agent because it **removes** electrons from the Mg;
- the Mg is the **reducing** agent because it **gives/donates** electrons to the  $\text{Pb}^{2+}$ .

#### 4. *Displacement reactions of halogens.*

The displacement of a halogen from its aqueous salt by a more reactive halogen is a redox reaction.

For example, chlorine displaces bromine from aqueous potassium bromide. The ionic equation is:



In this reaction,

- the  $\text{Br}^-$  ions are **oxidised** because they **lose** electrons to become  $\text{Br}_2$  molecules;
- the  $\text{Cl}_2$  molecules are **reduced** because they **gain** electrons to become  $\text{Cl}^-$  ions;
- the  $\text{Cl}_2$  is the **oxidising** agent because it **removes** electrons from the  $\text{Br}^-$  ion;
- the  $\text{Br}^-$  is the **reducing** agent because it **gives/donates** electrons to the  $\text{Cl}_2$ .