

Name: _____ () Date: _____

Class: 4Q

Marks: _____

1. REDOX REACTIONS IN TERMS OF GAIN/LOSS OF OXYGEN / HYDROGEN

1.1 Gain/ loss of oxygen atoms

a. Oxidation

Oxidation involves the _____ of oxygen .

A substance is oxidised if it _____ oxygen.

An oxidising agent is a substance that _____

_____.

b. Reduction

Reduction involves the _____ of oxygen.

A substance is reduced if it _____ oxygen.

A reducing agent is a substance that _____

_____.

For example, $\text{Zn(s)} + \text{CuO(s)} \rightarrow \text{ZnO} + \text{Cu(s)}$

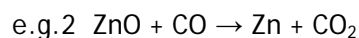
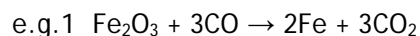
- _____ is oxidised because it gains oxygen
- _____ is reduced because it loses oxygen
- _____ is the oxidising agent
- _____ is the reducing agent

c. Application of oxidation and reduction reactionsi. *Combustion*

Combustion reactions are oxidation reactions - gaining of oxygen

e.g.1 burning of C: $\text{C} + \text{O}_2 \rightarrow \text{CO}_2$ e.g. 2 burning of Mg: $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$ ii. *Extraction of metals*

Metals can be extracted from their ores by heating with carbon monoxide



- d. Oxidation and reduction always take place together in the same reaction. There can be no oxidation, without the corresponding reduction and vice versa. We call the combined process a _____ reaction.

1.2 Gain/loss of hydrogen atoms

a. Oxidation

Oxidation involves the _____ of hydrogen.

A substance is oxidised if it _____ hydrogen.

b. Reduction

Reduction involves the _____ of hydrogen.

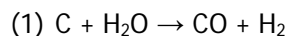
A substance is reduced if it _____ hydrogen.

For example, $\text{H}_2\text{S}(\text{g}) + \text{Cl}_2(\text{g}) \rightarrow 2\text{HCl}(\text{g}) + \text{S}(\text{s})$

- _____ is oxidised because it loses hydrogen
- _____ is reduced because it gains hydrogen
- _____ is the oxidising agent
- _____ is the reducing agent

c. Exercise

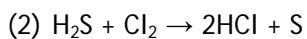
For each of the following reactions, state (i) the substance that is oxidised, (ii) the substance that is reduced, (iii) the oxidising agent and (iv) the reducing agent. State the reason for each of your answers.



Substance oxidised: _____

Substance reduced: _____

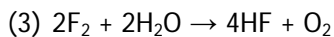
Reason: _____



Substance oxidised: _____

Substance reduced: _____

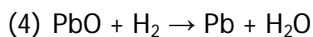
Reason: _____



Substance oxidised: _____

Substance reduced: _____

Reason: _____



Substance oxidised: _____

Substance reduced: _____

Reason: _____

2. REDOX REACTIONS IN TERMS OF GAIN/LOSS OF ELECTRONS

a. Oxidation

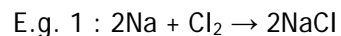
Oxidation involves the _____ of electrons.

A substance is oxidised if it _____ electrons.

b. Reduction

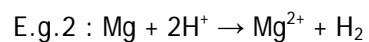
Reduction involves the _____ of electrons.

A substance is reduced if it _____ electrons.



- _____ is oxidised because it loses electrons
- _____ is reduced because it gains electrons

- _____ is the oxidising agent
- _____ is the reducing agent



- _____ is oxidised because it loses electrons
- _____ is reduced because it gains electrons
- _____ is the oxidising agent
- _____ is the reducing agent

c. Exercise

Complete the following equations by adding the necessary number of electrons to the appropriate sides so that the total charges on both sides are equal. Hence, state whether the species on the left is oxidised or reduced.

- (a) $\text{Al} \rightarrow \text{Al}^{3+}$ _____
- (b) $\text{Cl}_2 \rightarrow 2\text{Cl}^-$ _____
- (c) $\text{Cu}^{2+} \rightarrow \text{Cu}$ _____
- (d) $2\text{Br}^- \rightarrow \text{Br}_2$ _____
- (e) $\text{Mg}^{2+} \rightarrow \text{Mg}$ _____
- (f) $2\text{O}^{2-} \rightarrow \text{O}_2$ _____