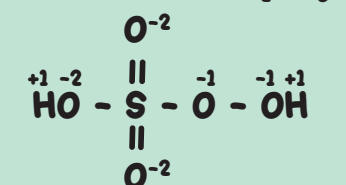


RULES FOR ARRANGING OXIDATION NUMBER (ON)

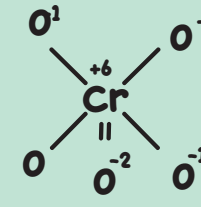
- Oxidation Number of single element is always 0.
- Oxidation Number of ions only one atom. ON is equal to charge on ion
- Oxidation Number of oxygen in most compound is -2
- Oxidation Number of hydrogen is +1, except when it is bonded to metals in binary compounds.
- Halogens have an oxidation number of -1, when they occur as halide ions in their compounds.
- Algebraic sum of oxidation number all the atoms in a compounds must be zero

OXIDATION NUMBERS BY STRUCTURE

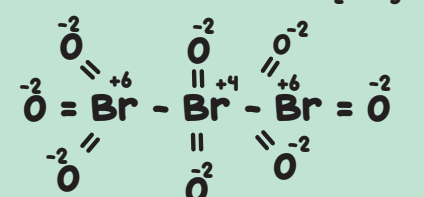
a) Caro's acid (H_2SO_5)



b) Chromium (VI) peroxide



c) Caro's acid (H_2SO_5)



OXIDATION NUMBER

It indicates the number of electron gained or lost by a particular atom.

1 Oxidation is loss of electrons.

2 They are considered as reducing agents.

3 Lower oxidation number.

REDOX IN DAILY LIFE

Photosynthesis
Electron of metals
Combination process
Electrochemical cells

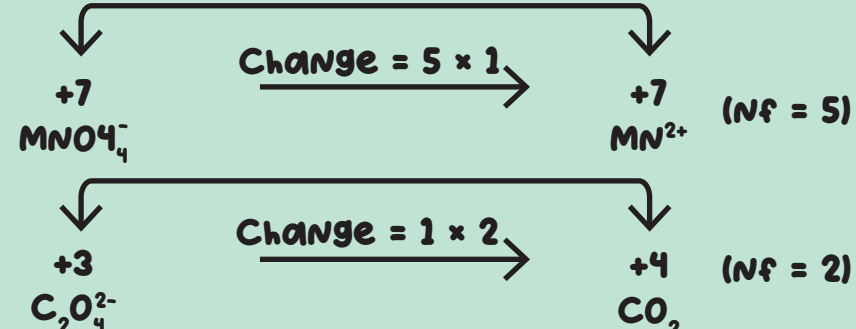
1 Reduction is gain of electrons.

2 They are considered as oxidising agents.

3 Increases Oxidation Number.

CALCULATION OF N- FACTOR

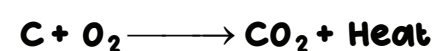
N-factor of oxidising agent/reducing agent = Change in oxidation number per molecule



Modern

OXIDATION

Addition of oxygen or removal of hydrogen from a substance.



REDUCTION

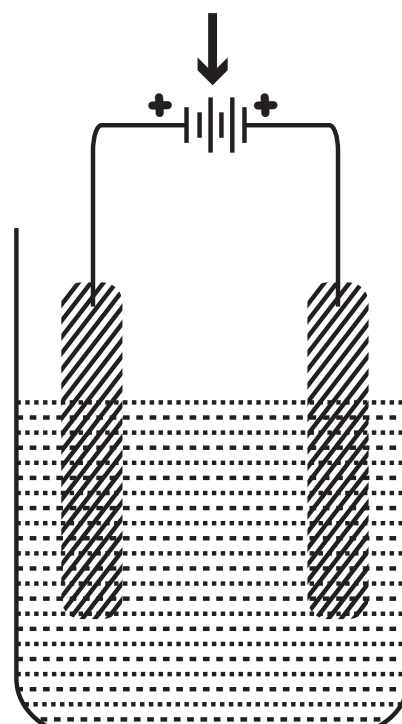
Removal of oxygen or addition of hydrogen from a substance.



Modern

OXIDATION AND REDUCTION

APPLICATION



Study of electrode processes and cells

REDOX REACTION

OXIDATION NUMBER METHOD

- Write the correct formula of the reaction
- Identify atoms undergoing change in Oxidation number
- Calculate increase or decrease in Oxidation number per atom and for entire ion or molecule. If unequal, multiply by suitable number to make equal.
- Add H^+ / OH^- ion to make total ionic charges of reactants and product equal
- Equalize H^+ on two sides by adding water.

1st Method

BALANCING REDOX REACTION

2nd Method

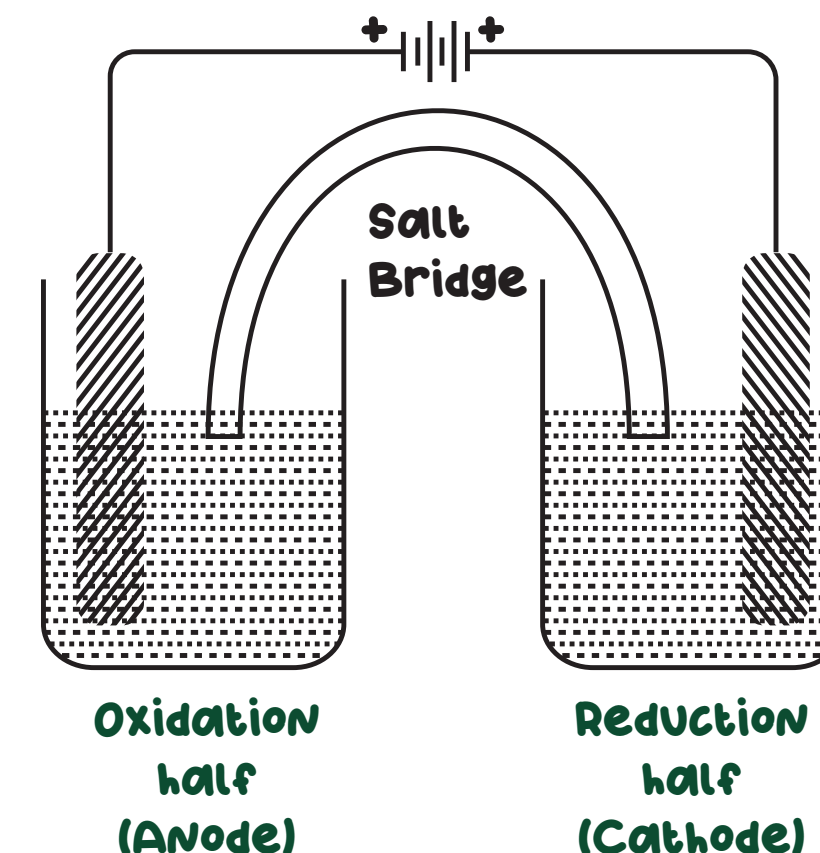
HALF REACTION METHOD

- Separate equation into two half reaction.
- Balance atoms other than O and H
- For reaction occurring in acidic medium. Add H_2O to balance O atoms and H^+ to balance H atoms.
- Balance charges by adding e^- to one side of the half reaction.
- Add two half reactions and cancel the e^- on each side.
- Scale the equation has same type and no. of atoms and same charges on both sides of the equation.

ELECTRO-CHEMICAL SERIES

A series of electrodes on half cells arranged in order of their increasing standard oxidation potentials or in the decreasing order of their standard reduction potential.

GALVENIC CELL



COMBINATION REACTION

Two reactants combine to form single products
 $\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \longrightarrow \text{H}_2\text{O}(\text{l})$

DECOMPOSITION REACTION

Breakdown of a compound into two or more compounds
 $\text{CaCO}_3(\text{s}) \xrightarrow{\Delta} \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$

DISPLACEMENT REACTION

An ion/atom in a compound, is replaced by an ion/atom of another elements.
 $\text{CuSO}_4(\text{aq}) + \text{Zn}(\text{s}) \longrightarrow \text{ZnSO}_4(\text{aq}) + \text{Cu}$

DISPROPORTIONATION

An element in one oxidation state is simultaneously oxidised and reduced
 $2\text{H}_2\text{O}_2(\text{l}) \longrightarrow 2\text{H}_2\text{O}(\text{l}) + \text{O}_2(\text{g})$