

# Redox reaction

No. of equivalents, equivalent mass, normality

Equivalent Concept  $\rightarrow$  reaction independent

$\rightarrow$  reaction doesn't need to be balanced

Reaction  $\begin{cases} \rightarrow \text{Balanced} \rightarrow \text{use mole concept} \\ \rightarrow \text{Unbalanced} \begin{cases} \rightarrow \text{Balance it} \rightarrow \text{mole concept} \\ \rightarrow \text{Calculate } n_f \rightarrow \text{eq. concept} \end{cases} \end{cases}$

No. of equivalent  $\rightarrow$  no. of moles  $\times$  n-factor

$$\Sigma = \frac{\text{Molar mass}}{n_f}$$

$$\text{Normality} = \text{Molarity} \times n_f$$

$$\Sigma = \frac{\text{Molar mass}}{\text{Total no. of } [H^+/\text{OH}^-] \text{ replaceable or to be replaced}}$$

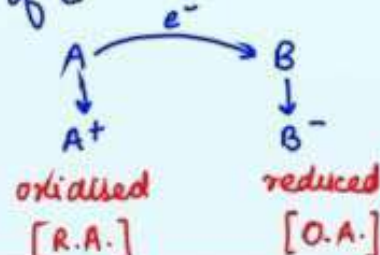
is calculated for 1 mole only

No. of  $e^-$  transferred per mole

$$N = \text{no. of equivalent/v}$$

## Redox reaction

it is basically transfer of  $e^-$



## Law of equivalence

equivalent of acid = equivalent of base

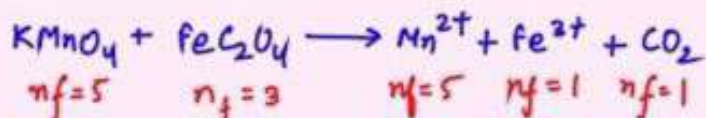


Calculation of n-factor for different type of redox reaction-

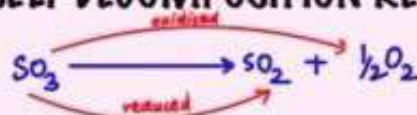
### → SIMPLE REDOX

O.A. + R.A.  $\rightarrow$  reduced form + oxidised form of O.A.

### → COMBINED REDOX



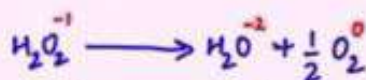
### → SELF DECOMPOSITION REACTION



$$n_f = n \text{ Reduction}$$

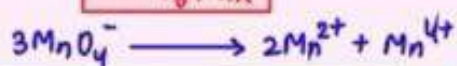
In a single molecule, one element will undergo ox<sup>n</sup> & other one is reduced

### → DISPROPORTIONATION REACTION



$$n_f = \frac{n_o \times n_R}{n_o + n_R}$$

same element gets oxidised as well as reduced



$$n = \frac{\text{total charge}}{\text{total item}} = \frac{2(7-2) + 1(7-4)}{3}$$

only for rea<sup>n</sup> in which same element gets reduced in 2 diff. stages

$\rightarrow$  if oxidised  $\rightarrow$  combined redox

## Balancing of chemical reaction

$\rightarrow$  Calculate n-factor of oxidising agent & reducing agent.

$\rightarrow$  Cross multiply with the simplest ratio of n-f

$\rightarrow$  Balance atoms under-going oxidation & reduction.

$\rightarrow$  To Balance O & H

Acidic medium

O  $\rightarrow$  comes from  $\text{H}_2\text{O}$

H  $\rightarrow$  from  $\text{H}^+$

Basic medium

O  $\rightarrow$  comes from  $\text{OH}^-$

H  $\rightarrow$  from  $\text{H}_2\text{O}$

