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Chemistry Assignment

Q.2 Define extrinsic and Intrinsic semiconductor.

Ans. Intrinsic semiconductor are pure as no impurity are embedded. Their conductivity is poor. Number of electrons and holes are equal in concentration ie $n_h = n_e$. Fermi energy level lies in centre of forbidden energy gap.
eg: Silicon Germanium.

Extrinsic Semiconducter
Impurity are embedded to increase conductivity. Electrons and hole are not in equal concentration ie $n_e \neq n_h$. Fermi energy do not lies in centre of forbidden energy gap.
eg:

Q.3 Differentiate between n type and p type semiconductor.

Ans.

n-type semiconductor	p-type semiconductor
i) It is formed by doping pentavalent impurity. P, As, Sb.	It is formed by doping trivalent impurity. Al, Ga, In.
ii) e^- are majority carrier and holes are minority carrier. $n_e >> n_h$	ii) holes are majority carrier e^- are minority carrier $n_h >> n_e$
iii) It is doner type	iii) It is acceptor type
iv) Donor level lies close to Conduction band	iv) Acceptor level lies close to valence band.

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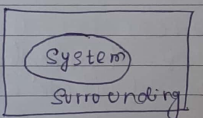
Q.4 Explain the following terms with example.
i) System and Surrounding
Ans. System
It is consist of those molecule which are reacting.
System is separated from surrounding by system boundries.

Surrounding
Everything external to the system is thermodynamic surrounding.



System + Surrounding = Universe

ii) Entropy
Ans. The quantitative measure of disorder or randomness in a system
eg
entropy of water is greater than ice.

unit is J/K Joule/kelvin.

∴ Entropy is system's thermal energy per unit temperature.

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iii) Enthalpy

The measurement of energy in thermodynamic system. It is thermodynamic quantity, which is equivalent to the total heat content of a system.

Hence Enthalpy is sum of enerhal energy E plus product of pressure and volume.

$$H = E + PV$$

eg: enthalpy of fusion, enthalpy of vaporization

iv) Electrochemical series and spectrochemical series

Ans. Electrochemical series

It is a series of chemical element arranged in order of their increasing standard electrode potential.

Spectrochemical series

It gives the arrangement of legand in increasing order of crystal field splitting. weak field legand causes less crystal field splitting. They form high spin complex eg Cl^-, F^-

Strong field legand cause greater field splitting. They form low spin complexes.

eg CN^-, CO.

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Q.6 How is ΔG related to ΔH and $T\Delta S$? What is the meaning of $\Delta G = 0$?

Ans

$\Delta G = \Delta H - T\Delta S$. (At Constant temperature and pressure).

Case I For Spontaneous rxn

ΔG must be -ve

Spontaneous rxn will occur when

ΔH is -ve

ΔS is +ve

Case II For Non spontaneous rxn

ΔH = +ve , $\Delta G > 0$.

ΔS = -ve.

$\Delta G = 0$ mean System is in equilibrium. The concentration of product and reactant will remain constant.

Q.7 What do you mean by electrochemistry? Discuss the oxidation and reduction by taking a suitable example.

Ans Electrochemistry is the relation between electrical and chemical energy and the conversion of one to other.

Oxidation is loss of e^- or hydrogen atom or gain of oxygen atom.

$CO_2 + H_2 \rightleftharpoons CO + H_2O$

reduction

oxidation.

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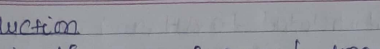
Reduction

It is the gain of e⁻ or hydrogen atom or loss of oxygen atom



Q8. Differentiate between E.M.F and potential difference.

Ans

	EMF	Potential difference
i)	It is the maximum p.d b/w two electrode of the cell when no current is drawn from cell i.e circuit is open.	i) It is the difference of potential b/w any two point in closed circuit.
ii)	It is independent of the resistance of the circuit.	ii) It is proportional to resistance b/w the given circuit.
iii)	This term is used only for the source of emf.	It is measured b/w any two point of the circuit.
iv)	It is greater than p.d b/w any two point in a circuit	iv) p.d is greater than emf when cell is fully charged

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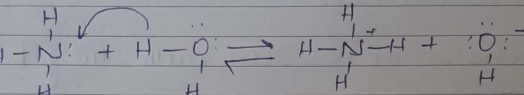
Q.9. Discuss lowry-Bronsted and Lewis concept of acid and bases.

Ans lowry Bronsted acid.
It is proton donor or hydrogen ion doner.

lowery Bronsted Base: It is a proton acceptor i.e hydrogen ion acceptor.

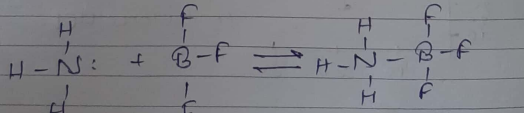


Hydrogen ion acceptor: lowry Bronsted Base.

Hydrogen ion doner: lowry bronsted acid

~~lewis Acid~~

lewis Acid are electron pair acceptor and lewis base is electron pair donor.

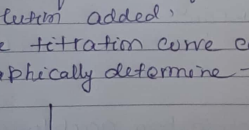


lewis base lewis acid.

Q.10. Briefly explain the principle of conductometric titration taking the example of titration of HCl versus NaOH.

Ans. Principle of Conductometric titration states that for dilution that are infinite Ion act independently and in the process contributed toward Conductance of the solution.
The principle behind this theory states that anion and cation have different Conductance value.

Titration of HCl soln with strong base NaOH.
Conductometric titration curve is a plot of the measured conductance or conductivity value as a function of the volume of the NaOH solution added.
The titration curve can be used to graphically determine the equivalence point.



Q.5 Under what condition an extensive property became intensive property? example

Ans
1) $\frac{\text{Mass (extensive)}}{\text{volume (extensive)}} = \text{density (intensive)}$

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ii) $\frac{\text{volume (extensive)}}{\text{unit mass}}$ = Specific volume (intensive)

Q.1. Discuss the bonding in $[CoF_6]^{3-}$ and $[Co(NH_3)_3]^{3+}$ complex in terms of CFT.

sp^3d^2 is hybridisation of $[CoF_6]^{3-}$. While in other complex it is d^2sp^3

In $[Co(NH_3)_3]^{3+}$

S.L $t_{2g}^{2,2,2}$ $eg^{0,0}$ $-2.4\Delta_0 + 2P$.