

(A)

FOR. Deg I Chem. Hons Paper-I

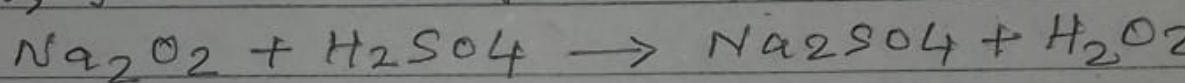
Hydrogen Peroxide (H_2O_2)

Hydrogen Peroxide may be Prepared by any one of the following method:-

(1) From Metallic sodium :-

When metallic sodium is heated in an excess of oxygen or air, sodium peroxide is obtained.

When this sodium peroxide is treated with cold 20% sulphuric acid, formation of H_2O_2 takes place

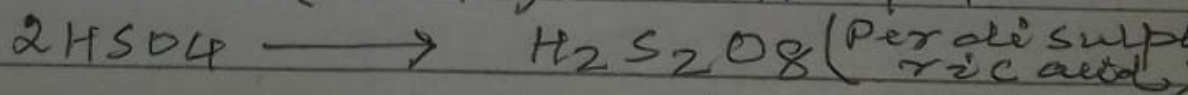
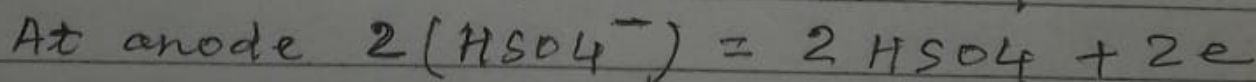
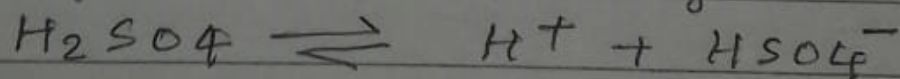


The sodium sulphate is removed by crystallisation.

(2) By Electrolytic Process :-

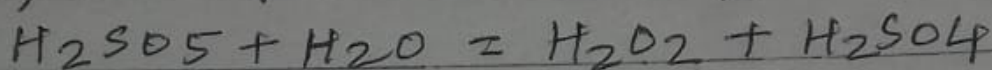
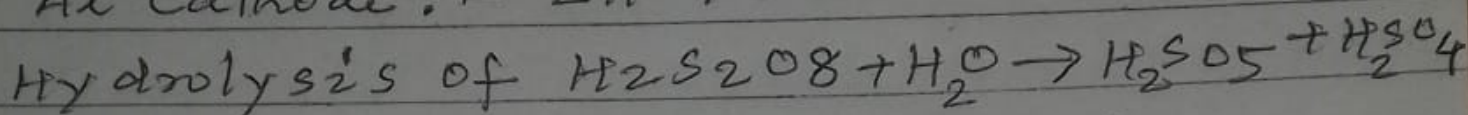
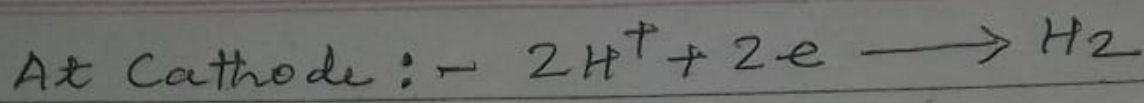
Hydrogen Peroxide is now Prepared by the electrolysis of 50% sulphuric acid using a platinum anode and under a high current density.

Perdisulphuric acid is formed as an intermediate product which undergoes hydrolysis with dil sulphuric acid to give H_2O_2



L. K. Mishra

(B)



Properties :-

Pure H_2O_2 is a pale blue liquid. The liquid has no smell. It boils between $66^\circ C - 70^\circ C$ under pressure of 26 mm. Prismatic crystal is obtained at $-2^\circ C$. It decomposes at $140^\circ C$. Its boiling point is $151^\circ C$ under reduced pressure by extrapolation.

Hydrogen peroxide possesses one loosely bonded oxygen atom which is very reactive in oxidation reactions.

Catalytic decomposition :-

Pure H_2O_2 is decomposed very rapidly if any dust be present. Finely divided gold, silver and colloidal platinum accelerates decomposition of H_2O_2 catalytically. Complex organic substances also function as catalyst.

The presence of small quantities of substances such as Alcohol, Glycerol make the solution more stable.

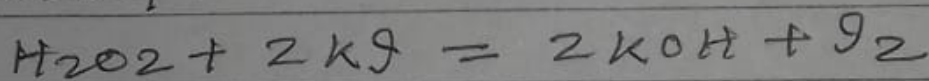
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These substances are called anti-catalyst or negative catalysts.

Oxidising Properties :-

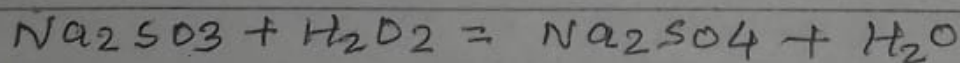
H₂O₂ resembles Ozone in strong oxidising property.

✓ (1) It oxidises KI into Iodine. This reaction is accelerated by mineral acids and also in the presence of FeSO₄.



✓ (2) Ferrous sulphate is oxidised to Ferric sulphate in presence of dilute H₂SO₄

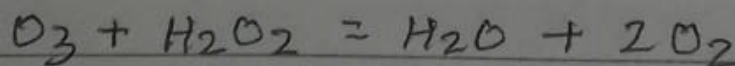
✓ (3) It oxidises sodium sulphite to sodium sulphate.



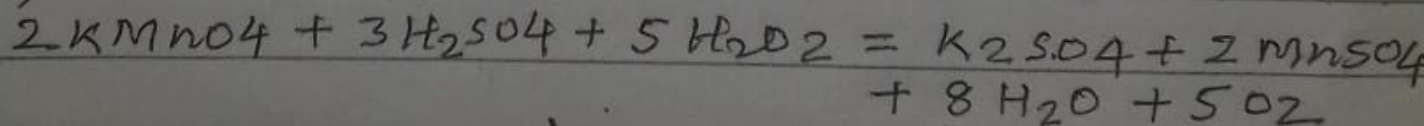
Reducing Properties :-

Hydrogen Peroxide reduces powerful oxidising agents

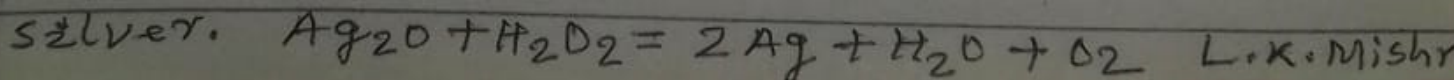
✓ (1) With Ozone it forms oxygen and water



✓ (2) It reduces acidified KMnO₄



✓ (3) It reduces moist silver oxide to metallic silver.



L.K. Mishra