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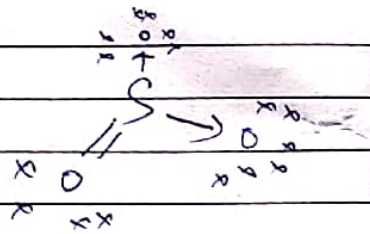
Topic — Sulpher trioxide :-

Molecular formula of Sulpher trioxide is SO_3. Its electronic structure is represented as.



SO_3 is prefared as (i) Ferrous sulphate on heating gives rise to SO_3

$$2\,FeSO_4 \longrightarrow SO_3 + Fe_2O_3 + SO_2$$

SO_2 on oxidation gives rise to SO_3

$$2\,SO_2 + O_2 \underset{V_2O_5}{\rightleftarrows} 2\,SO_3 + Q$$

The above reaction is reversible reaction and Catalyst Catalysed. Catalyst used is V_2O_5

Properties (a) SO_3 on reaction with H_2O gives H_2SO_4 $\quad SO_3 + H_2O \rightarrow H_2SO_4$

SO_3 on reaction with H_2SO_4 forms.

$H_2S_2O_7$ OLEUM.

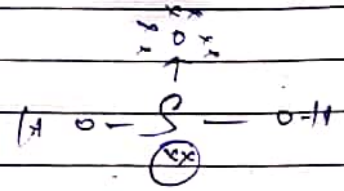
Oleum on further reaction with H_2O gives H_2SO_4

$$SO_3 + H_2SO_4 \rightarrow H_2S_2O_7$$

$$H_2S_2O_7 + H_2O \rightarrow 2H_2SO_4$$

H_2SO_3 SULPHUROUS ACID

Molecular formula of sulphurous acid is H_2SO_3. oxidation no. of "S" in H_2SO_3 is +4. Its structure is written as follows.



H_2SO_3 is obtained by reaction of SO_2 and H_2O

$$SO_2 + H_2O \rightleftharpoons H_2SO_3$$

(1) H_2SO_3 acts as reducing agent.

$$\overset{+4}{H_2SO_3} + O_2 \rightarrow \overset{+6}{H_2SO_4}$$

In the above reaction "S" of H_2SO_3 oxidation no changes +4 to +6 in terms of electron it loses electron therefore acts as reducing agent.

(ii) H_2SO_3 oxidises H_2S to "S"

$$\overset{+4}{H_2SO_3} + 2H_2S \rightarrow 3H_2O + 3\overset{0}{S}$$

oxidation no decreases and acts as an oxidising agent. of sulphur