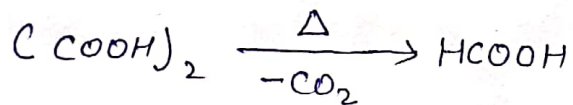


Q Mention properties and uses of oxalic acid.

Ans Properties:

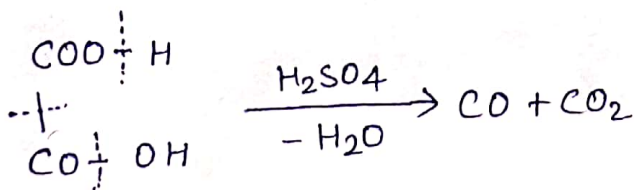
(1) It is a colourless crystalline solid having two molecules of water of crystallisation. It is poisonous, soluble in water and alcohol.

(2) Action of heat: The m.p of hydrated acid is  $101.5^\circ$  while that of the anhydrous acid is  $189.5^\circ$ . It is decomposed above its m.p ( $>200^\circ$ ) giving methanoic acid.

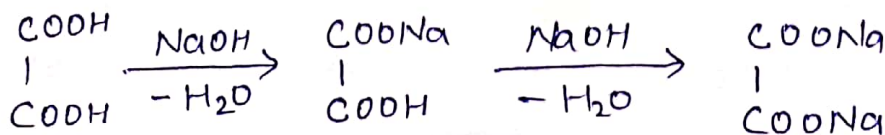


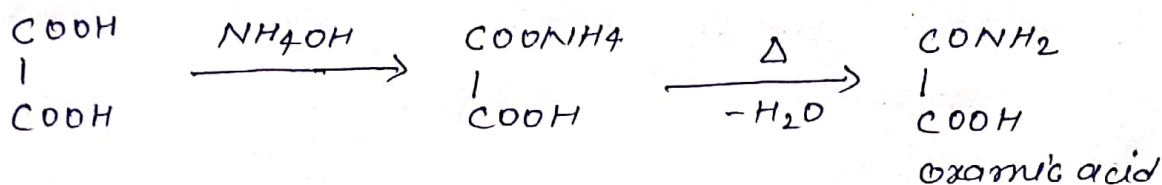
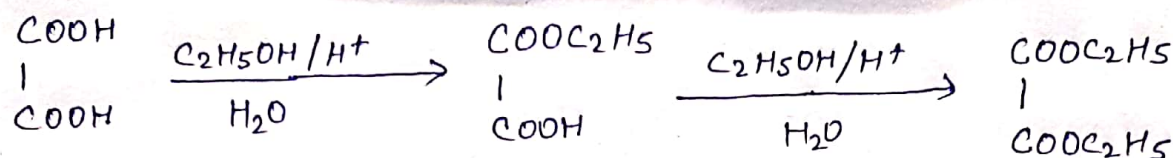
3 Reaction with glycerol: It reacts with glycerol to form methanoic acid or allyl alcohol depending upon the experimental conditions

4 It loses water giving CO and CO<sub>2</sub> mixture with Conc H<sub>2</sub>SO<sub>4</sub>

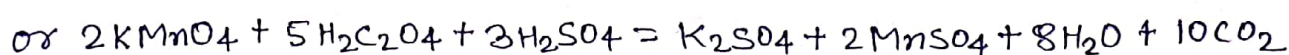
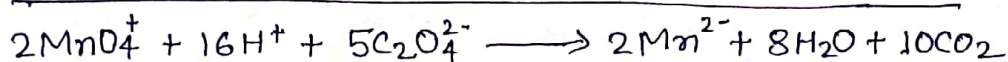
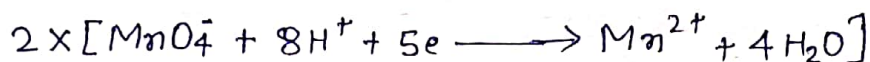


5 It forms two series of salts, esters, amides and acid halides showing the presence of the COOH groups.

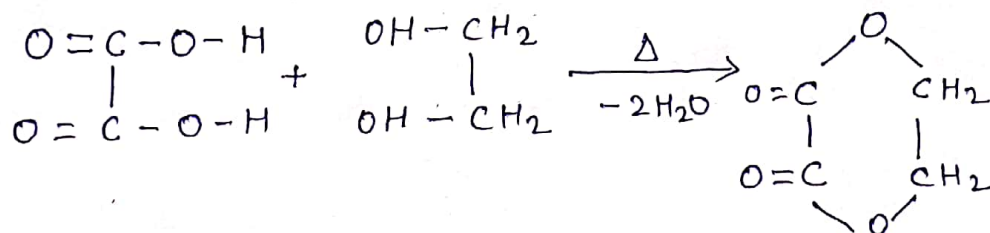




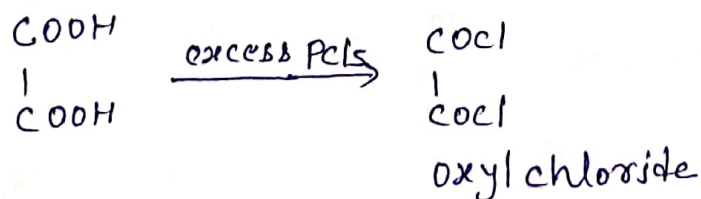
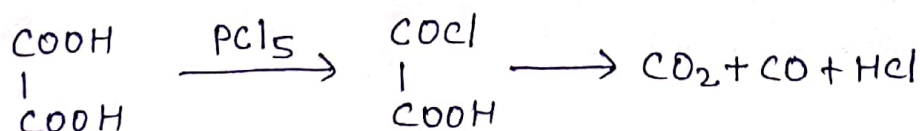
6 Acidified  $\text{KMnO}_4$  oxidises it at  $60^\circ$  to  $\text{CO}_2$



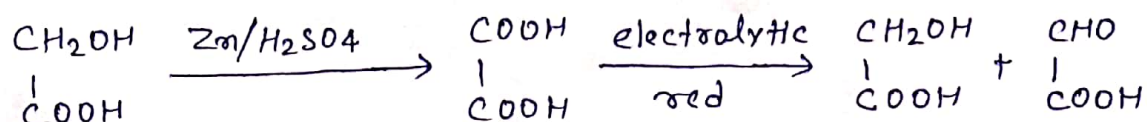
(7) with ethylene glycol, it forms ethylene oxalate:



8 When it is treated with excess  $\text{PCl}_5$ , the two  $-\text{OH}$  groups are replaced by  $\text{Cl}$  atoms. If an excess  $\text{PCl}_5$  is not taken, it gets decomposed:



9 It reduces to glycollic acid:



Uses: (i) Its Sb-salts are mordants (ii) ferrous oxalate is used as a developer in photography (iii) In removing ink stains from cloth and bleaching wood, leather etc. (iv) As a primary standard in volumetric analysis (v) In the preparation of alkyl alcohol and methanoic acid in lab. (vi) In the manufacture of metallic oxalate etc (vii) In the qualitative analysis as a reagent.