SUBJECT - CHEMISTRY

CLASS - B.Sc (Hons) PART-II

PAPER - IV

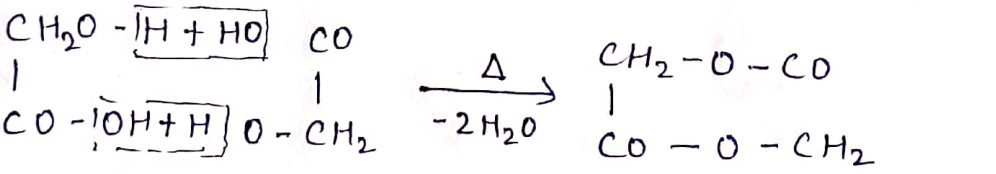
TOPIC - Action of heat

Dr Hari Mohan prasad Singh
Department of Chemistry
Dr. L.K.V.D College Tajpur Samastipur

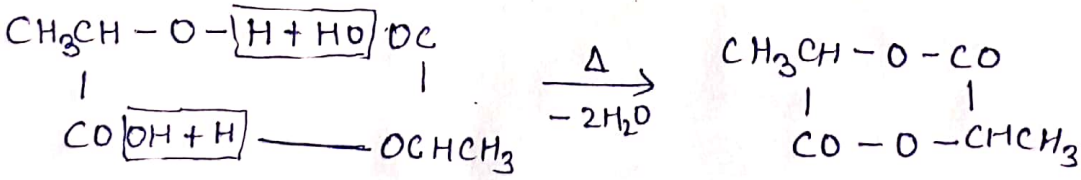
Q Discuss the action of heat on α, β and γ hydroxy acid

Ans Action of heat:

Hydroxy acids, on heating form different products depending upon the position of -OH and -COOH groups in the molecule. α-hydroxy acid form cyclic anhydrides or diesters called lactides by the loss of two H_2O molecules from two acid molecules. The -OH group of one molecule reacts with the -COOH group of another molecule.

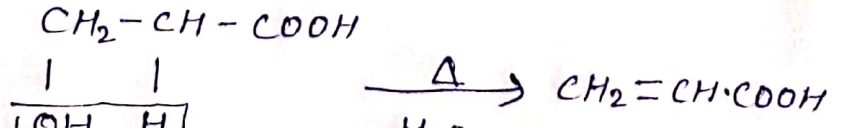


glycollic acid — Lactide (glycollide)

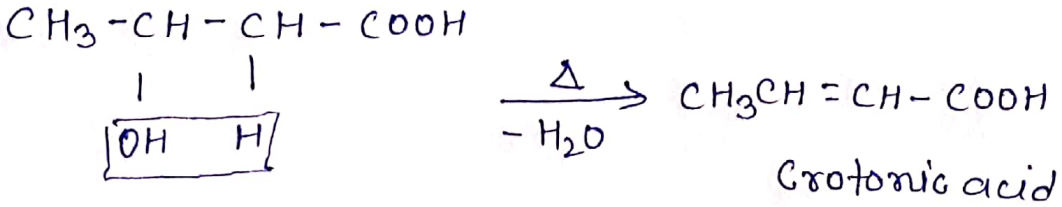


Lactide

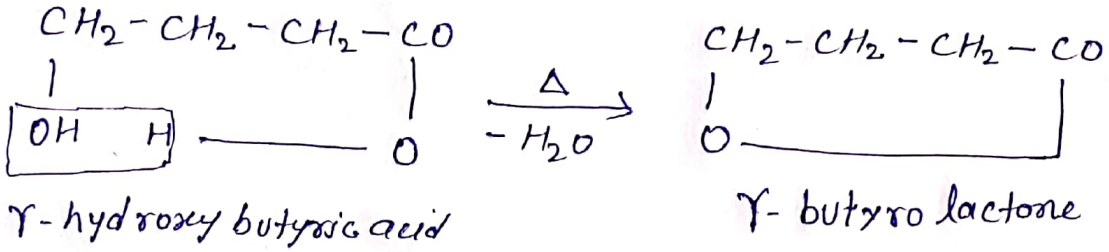
Lactides give back hydroxy acid on boiling with water β-hydroxy acids form α, β unsaturated acids by the loss of one water molecule from one acid molecule:

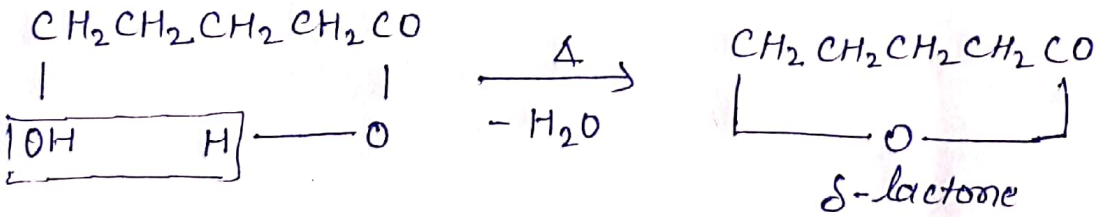


β-hydroxy propanoic acid — acrylic acid



γ and δ-hydroxy acids form more readily inner esters called lactones by the interaction of -OH and -COOH groups of the same acid molecule with the elimination of one H_2O molecule:





Thus α, β and γ-hydroxy acid can be distinguished from one another by their behaviour on heating. Lactones give corresponding fatty acids on reduction with Na-Hg in acid solution. Their absorption region of C-O stretching in γ-lactone is 1780-1760 cm^{-1} whereas in α-lactones, it is 1750-1735 cm^{-1}