(B) Reactions due of $-COOH$ group.

An aqueous solution of amino acid liberates CO_2 by addition of sodium bicarbonate due to $-COOH$ group.

1) Esterification-

Amino acids undergo to esterification on heating with alcohol in presence of dry HCl gas. Free ester is obtained by action of dil. aq. alkali solution.

$$R-\underset{\underset{+NH_3}{|}}{CH}-COO^- \xrightarrow{HCl} \left[R-\underset{\underset{+NH_3}{|}}{CH}-COOH\right] Cl^- \xrightarrow{C_2H_5OH}$$

Amino acid.

$$\left[R-\underset{\underset{+NH_3}{|}}{CH}-COOC_2H_5\right] Cl^- \xrightarrow{Na_2CO_3(aq)}$$

Amino ester hydrochloride.

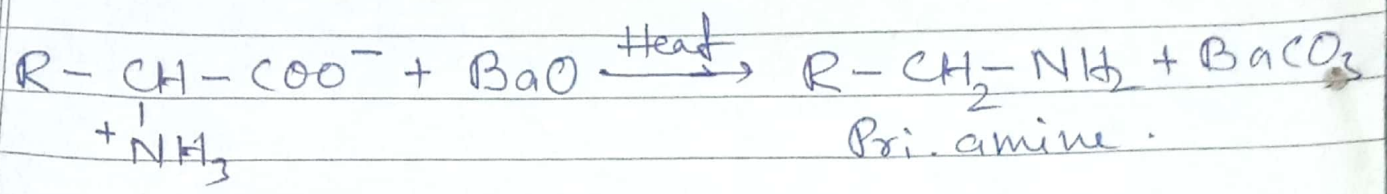
$$R-\underset{\underset{NH_2}{|}}{CH}-COOC_2H_5$$

α- Amino ester.

2) Decarboxylation-

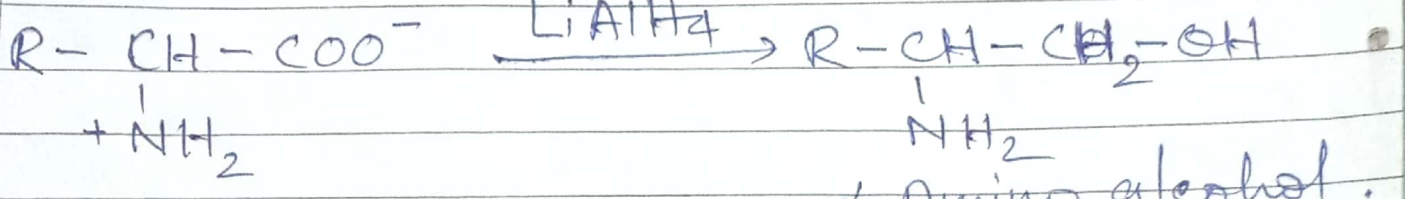
On heating with barium oxide or sodalime, α-amino acids ~~under go to~~ undergo to decarboxylation to form amines.

Date ___/___/_____



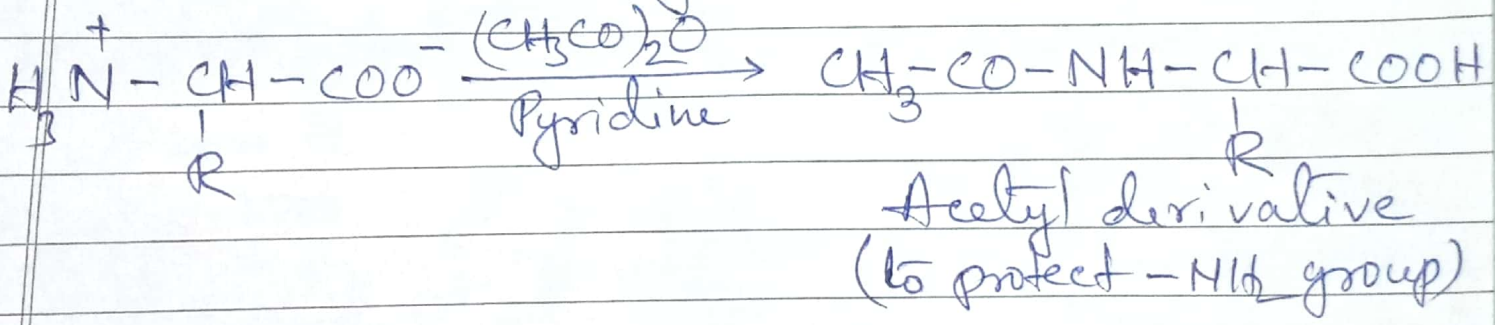
Pri. amine.

(3) Reduction:- On reduction with $LiAlH_4$ amino acids give α-amino alcohols.

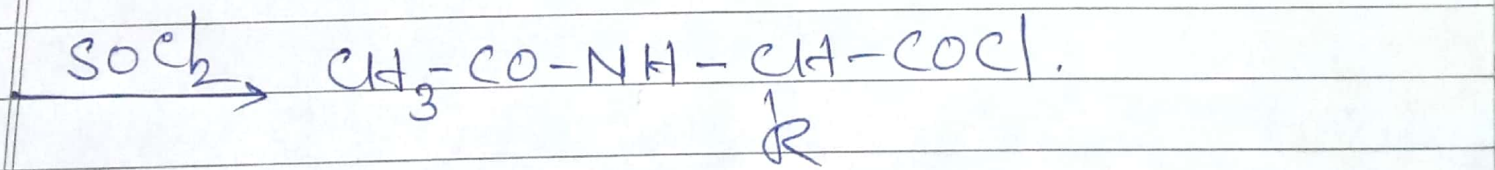


α-Amino alcohol.

(4) Formation of acid chloride:- By protecting amino group, α-aminoacids are converted into acid chloride by action of PCl_5 or $SOCl_2$.



Acetyl derivative
(to protect $-NH_2$ group)

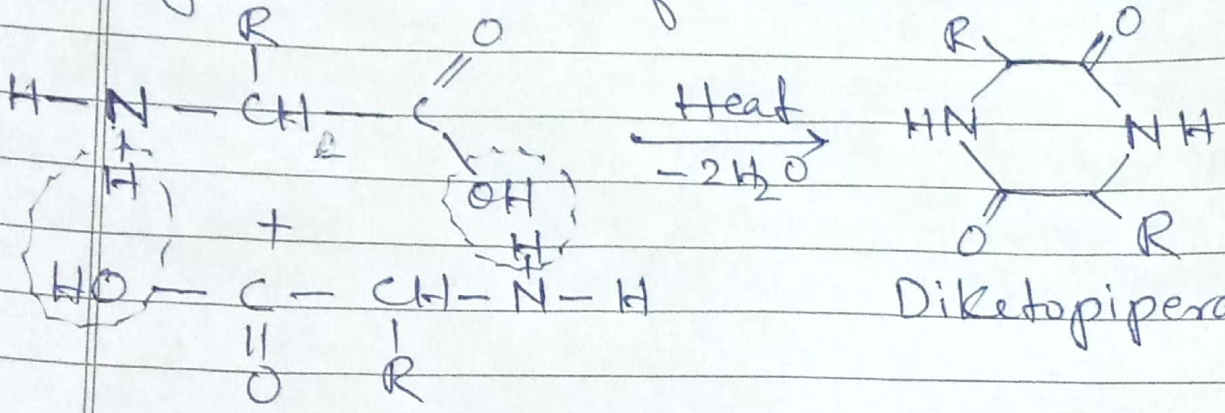


Saathi Notebooks

Date __/__/____

(C) Reactions involving both –COOH and –NH_2 groups.

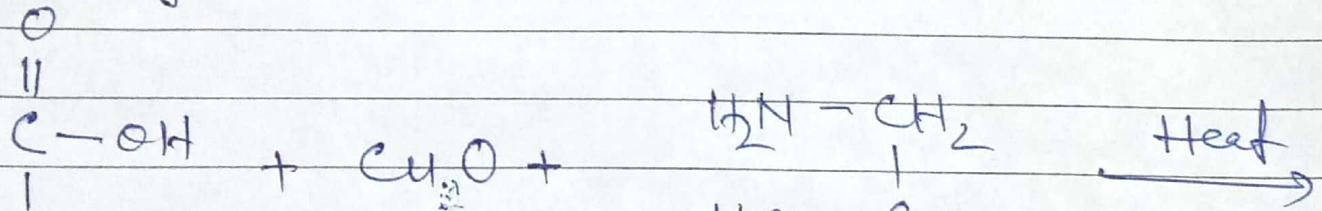
(1) Action of heat – On heating two molecules of α-amino acids are combined together by elimination of water molecule.



Diketopiperazine.

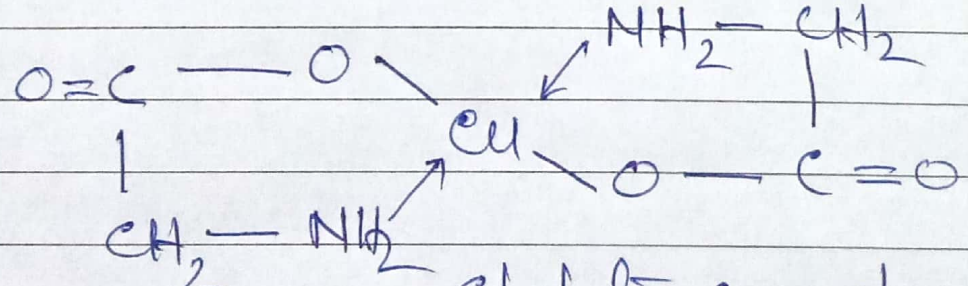
α-Amino acid.

(2) With heavy metal ions. – In aqueous solution amino acids form chelate compleaes with heavy metal ions.



Glycine.

Glycine

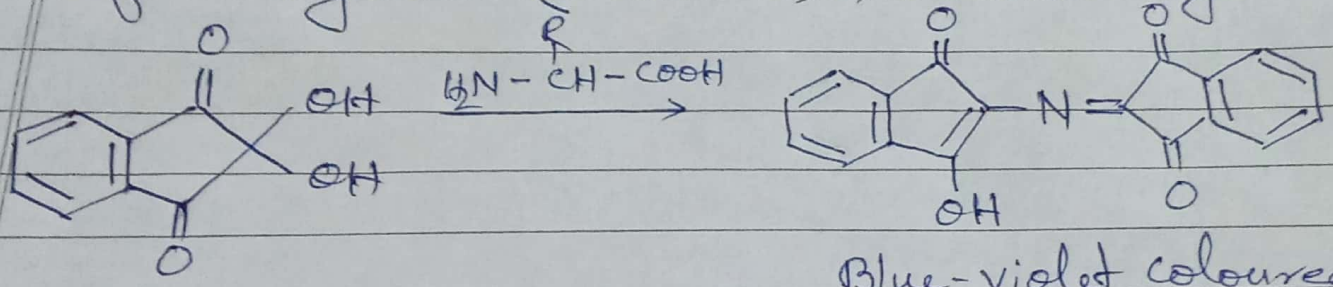


chelate complex
(Deep blue)

Date ___/___/_____

Ninhydrin test of amino acids :- Amino acids can be detected by ninhydrin test.

α-Amino acids give dark blue colour solution by addition of alcoholic solution of ninhydrin ~~(indan-1,2,3-trione hydrate)~~



Ninhydrin.

Blue-violet coloured complex