Introductory Biochemistry

Properties of Amino Acid

Lecture-4

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Properties : Physical

- Colourless
- Crystalline in nature
- Tasteless[tyrosine], sweet[glycine, alanine]
- Melting point above 200•C
- Soluble in polar solvent and Insoluble in non polar solvent
- Have absorbance at 280nm

- Mol wt: 100 – 50,000Dt
- All amino acids possess optical isomers due to the presence of asymmetric α-carbon atoms.
- Some are structurally stable and sterically hindered [Glycine]
- Amino acids [proteins]posses enzymatic activities
- Amino acids exhibit colloidal nature and denaturing property

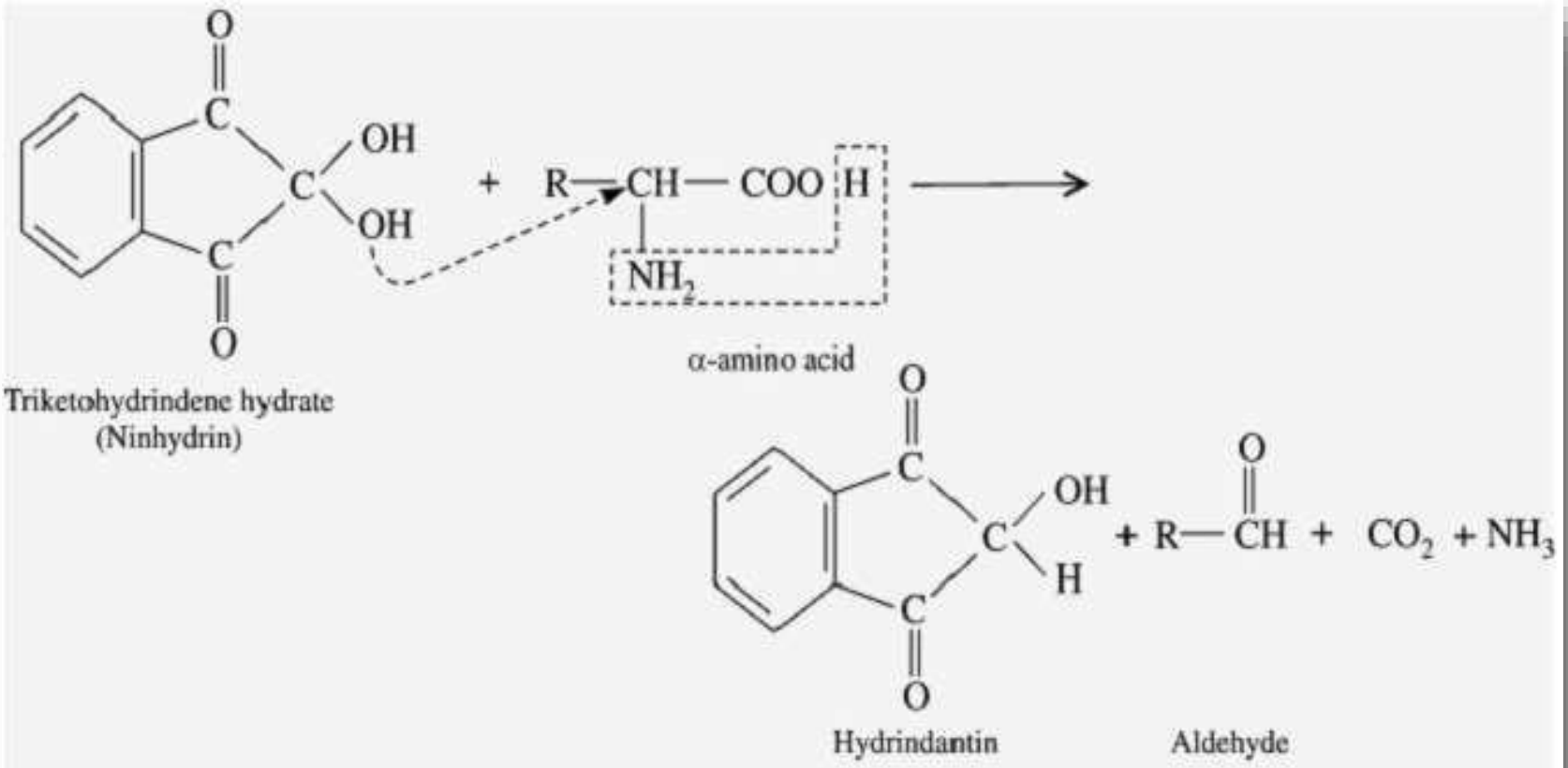
Chemical properties

- Decarboxylation:

The amino acids will undergo decarboxylation to form the corresponding "amines". Thus amines are produced

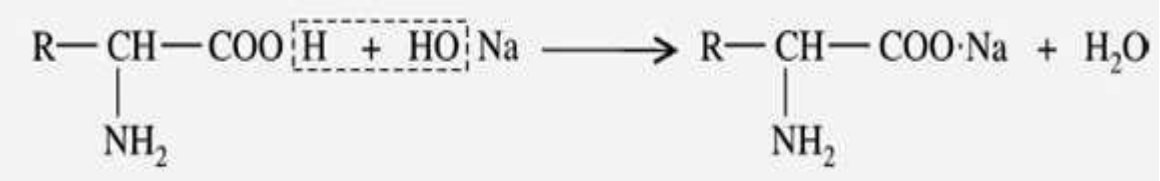
- **Histidine** → Histamine + CO_2
- **Tyrosine** →Tyramine + CO_2
- **Lysine** →Cadaverine + CO_2

Reaction with Ninhydrin:



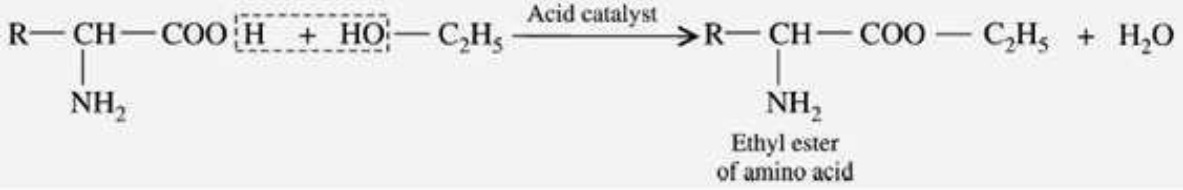
- **Reaction with Alkalies (Salt formation):**

The carboxyl group of amino acids can release a H^+ ion with the formation of Carboxylate (COO^-) ions.



- **Reaction with Alcohols (Esterification) :**

The amino acids is reacted with alcohol to form, "Ester". The esters are volatile in contrast to the form amino acids.



- **Reaction with DANSYl Chloride:**

  DANSYl chloride means “Dimethyl Amino Naptha Sulphonyl Chloride”.

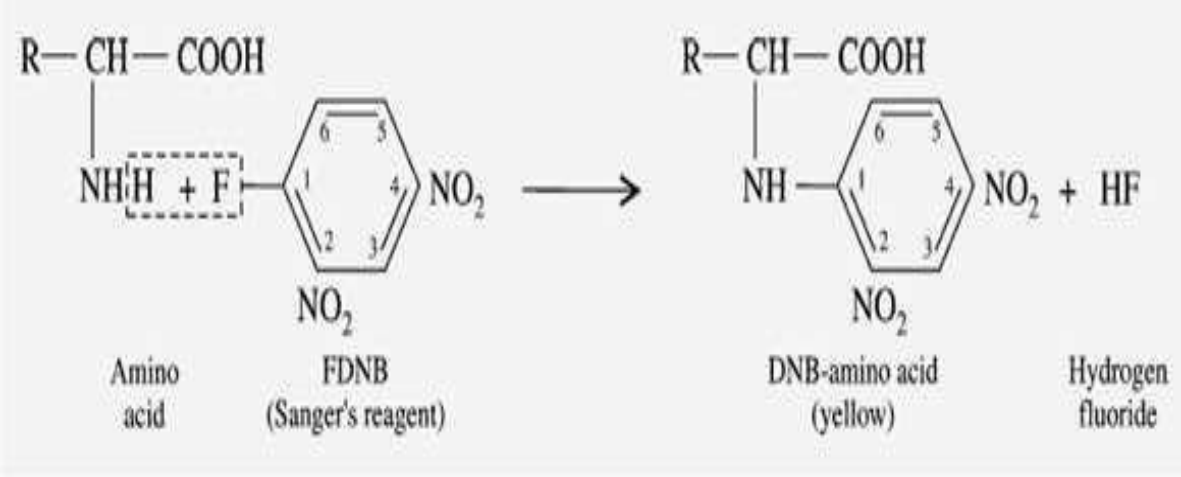
  When the amino acid reacts with DANSYl chloride reagent, it gives a “Flourescent DANSYl derivative

- **Reaction with acylating agents (Acylation):**

  When the amino acids react with “Acid chloride” and acid anhydride in alkaline medium it gives “pthaloyl amino acid

Reaction with Sanger's reagent

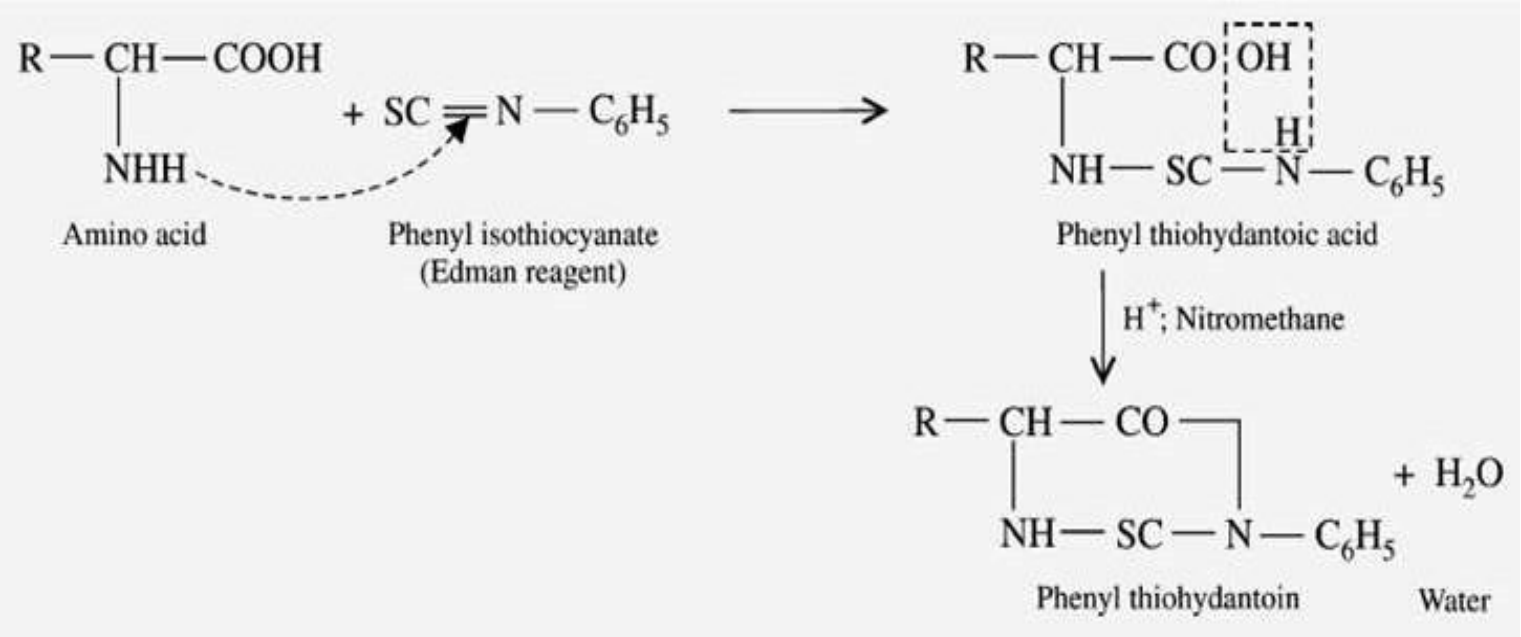
"1-flouro-2,4-dinitrobenzene" is called Sanger's reagent (FDNB).sanger's reagent reacts with α-amino acid to produce Yellow coloured derivative, DNB-amino acid.



Reaction with Edmann's reagent:

Edmann's reagent is **"phenylisothiocyanate"**. When amino acids react with Edmann's reagent

it gives "***phenyl thiohydantoic acid***" finally it turns into cyclized form "*Phenyl thiohydantoin*" (Edmann's derivative).



- Reference :

➢ Dr. J.L. Jain – Fundamentals of Biochemistry.