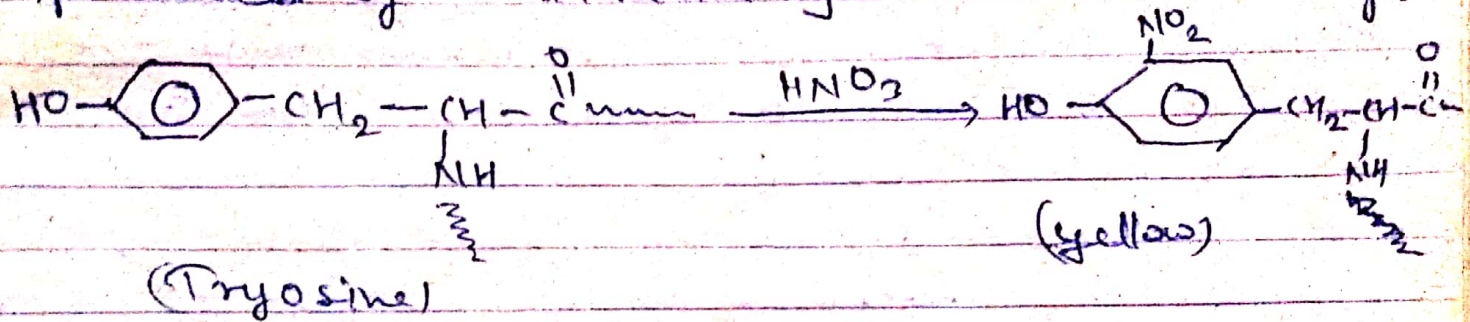


## Colour tests of proteins

1 Xanthoproteic test  $\rightarrow$  A protein solution on warming with concentrated nitric acid may turn yellow. This test is given by proteins containing tyrosine & tryptophane (amino acid with benzene ring), the yellow colour being produced by nitration of the aromatic ring.



2 Biuret test  $\rightarrow$  When a dilute solution of copper sulphate is added to a protein solution alkalinized with NaOH, a violet colour develops. The colour is due to the formation of a coordination compound between  $\text{Cu}^{2+}$  &  $\text{>C=O}$  &  $\text{-NH-}$  groups of the peptide chain.

3 ~~Million's test~~  $\rightarrow$  Hopkins & Cole test  $\rightarrow$  Conc  $\text{H}_2\text{SO}_4$  is added down the side of a test tube containing a solution of protein & glyoxylic acid, to form a layer. A violet ring will appear between the two layers if the protein has the amino acid tryptophan in its structure.

4. Ninhydrin test  $\rightarrow$  When a protein is boiled with a dil. solution of ninhydrin, a violet colour is produced. This test is given by all proteins containing  $\alpha$ -amino acids.

