## Xanthoproteic Test

- To detect the presence of aromatic groups-containing amino acids like <u>tyrosine</u> and <u>tryptophan</u>.
- To differentiate tyrosine ,tryptophan from other amino acids.
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 The Xanthoproteic test is based on the fact that aromatic groups in the amino acids are nitrated by heating with concentrated HNO<sub>3</sub> to yield intensely yellow-colored nitro derivative. On the addition of <u>alkali</u>, however, the residue turns orange due to the formation of a <u>salt of the nitro</u> <u>compound</u>.



## Procedure

- 1-Take three test tubes and put 2 ml of albumin in the first, 2 ml of tyrosine in the second, and in the third glycine.
- 2- Add 3 drops of concentrated nitric acid to the three tubes and heat in a boiling water bath for 5 minutes and observe the formation of a yellow precipitate.

- 3- Cool the tubes, then add 3 drops of 10% NaOH solution to each one, and note the formation of an orange color.
- In albumin, a white precipitate is formed when nitric acid is added due to the formation of <u>methaprotein.</u>



## Points to Ponder

- This test cannot be employed for urine testing as the final color of the test and the natural color of urine are similar.
- The aromatic amino acid **Phenylalanine will not** give a positive response to the test even though it contains benzene ring.

## Millon's Test:

• It is used to detect proteins and amino acids that contain the hydroxybenzene (phenol) group.



# • When proteins are heated with Millon's reagent (which consists of mercuric nitrate in concentrated nitric acid), a red color and precipitate are produced.

• It is attributed to the formation of mercury salt and tyrosine nitrate.

 This detector depends in its reaction on the presence of the phenol radical, so proteins that do not contain tyrosine do not give a positive detection.

There are some compounds such as salicylic acid and phenol that give a positive result for the **Millon** test.

### Procedure

- 1- Take three test tubes, put 2 ml of albumin in the first, 2 ml of tyrosine in the second, and 2 ml of glycine in the third.
- 2- Add 5 drops of Millon's reagent to each test tube.
- 3- Heat the tubes in a water bath for 10 minutes, then cool and observe the precipitate formed.

Millon's Test:

