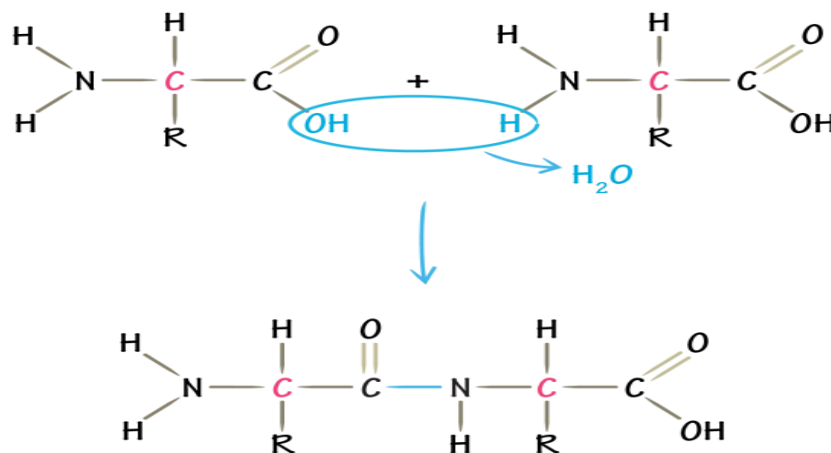


Proteins

Proteins: also known as polypeptides, are organic compounds made of amino acids arranged in a linear chain. These amino acids in the polymer are joined together by peptide bonds(between the carboxyl and the amino group) of the adjacent amino acid.

Peptide Bond Formation



Proteins are essential biological macromolecules, and they participate in almost all processes within the cell :

- 1 .Catalyzing biochemical reactions (enzymes).
- 2 .Structural and mechanical functions (actin and myosin).
- 3 .Cell signaling, and immune responses.
- 4 .Cell adhesion.
- 5 .Cell cycle.

Tests for proteins

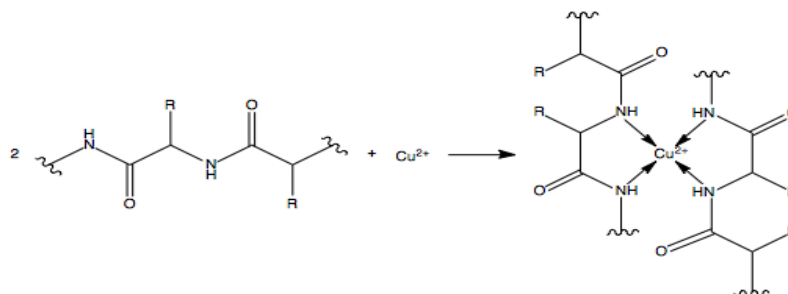
1 - Biuret test:

Test for the identification of proteins.

The reaction involves the formation of complex between the proteins and Cu^{2+} ions in the strong alkaline medium.

Purple coloured product is a positive test result for proteins in the sample.

Biuret's chemical reaction:



Biuret's Procedure: (One bottle)

1. Take 2ml of the protein solution in a clean test tube.
2. Add 2ml of Biuret reagent.
3. Mix well.
4. Observe the change in colour.
5. The appearance of a violet colour is a positive test result for the presence of proteins in the sample.

Biuret's Procedure: (Separate bottles)

1. Take 2ml of the protein solution in a clean test tube.
2. Add 5-6 drops of Biuret reagent.
3. Add 3ml of 40% NaOH solution.
4. Observe the change in colour.

5. The appearance of a violet colour is a positive test result for the presence of proteins in the sample.

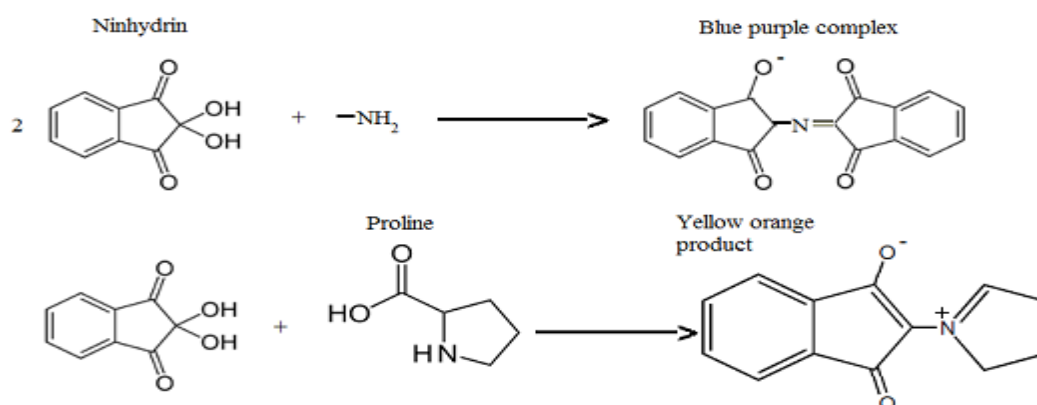
2 - Ninhydrin test:

This test is extremely sensitive for amino acids and proteins having free NH_2 group in their structure.

Ninhydrin (triketohydrindene) is a chemical used to detect ammonia and primary or secondary proteins.

Violet coloured product is a positive result.

Ninhydrin's chemical reaction:



Ninhydrin test procedure:

1. Take 1ml of amino acid solution.
2. Add 5 drop of 0.2% Ninhydrin solution in acetone.
3. Boil for ≈ 2 minutes, then cool.
4. The appearance of a purple colour is a positive test result for the presence of primary amino acids, while a deep yellow colour is a positive test result for the presence of secondary amino acids in the sample.