

# BCH 302 practical :

[1]Amino acid

-Qualitative tests of a.a

[2]Protein

-Qualitative chemical reactions of a.a protein functional groups

[3]Carbohydrates

-Physical properties

-Chemical properties

-Qualitative analysis of CHO

[4]Lipid

-Qualitative tests of lipids

[5]Spectrophotometric DNA quantification.



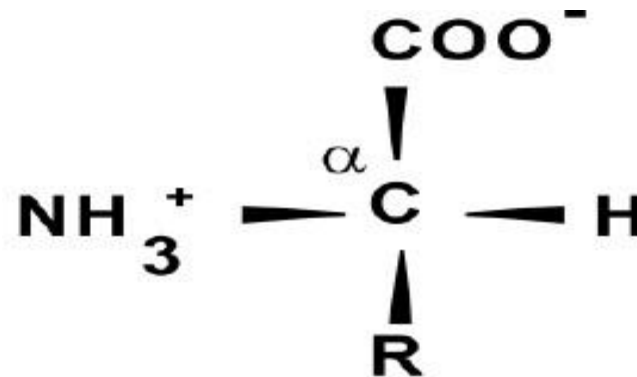
# Experiment 1

# Amino Acid

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BCH302

\*Amino acids play central roles both as building blocks of proteins and as intermediates in metabolism. There are 20 natural amino acid all of them involved in protein synthesis . All of them are L-alfa amino acids.

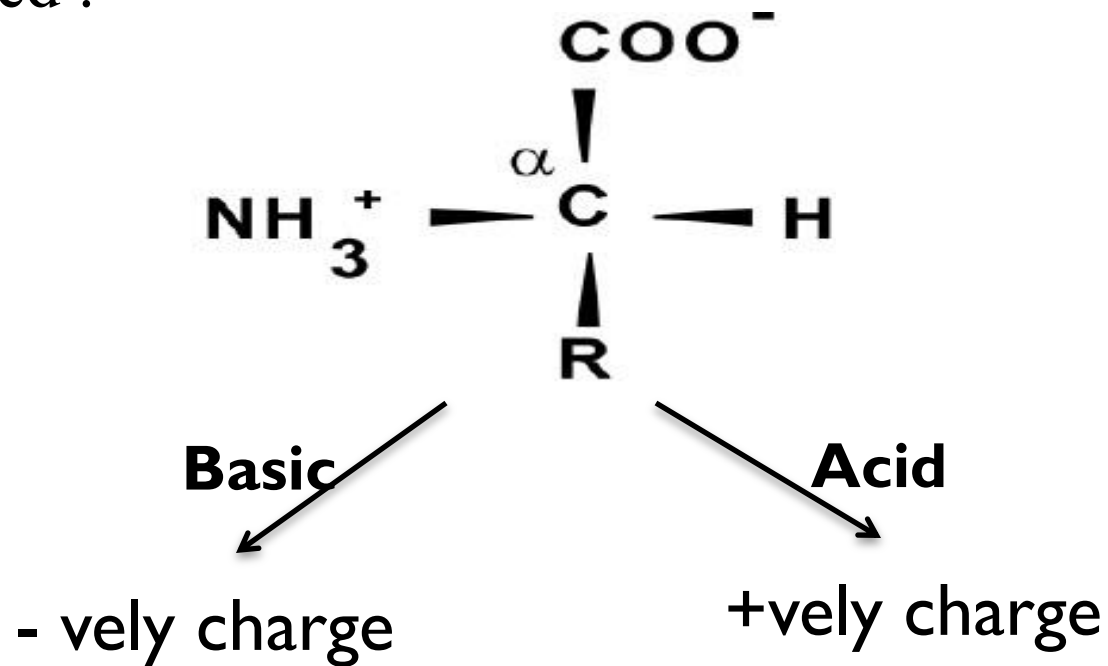


\*All amino acids found in proteins have this basic structure, differing only in the structure of the R-group or the side chain.

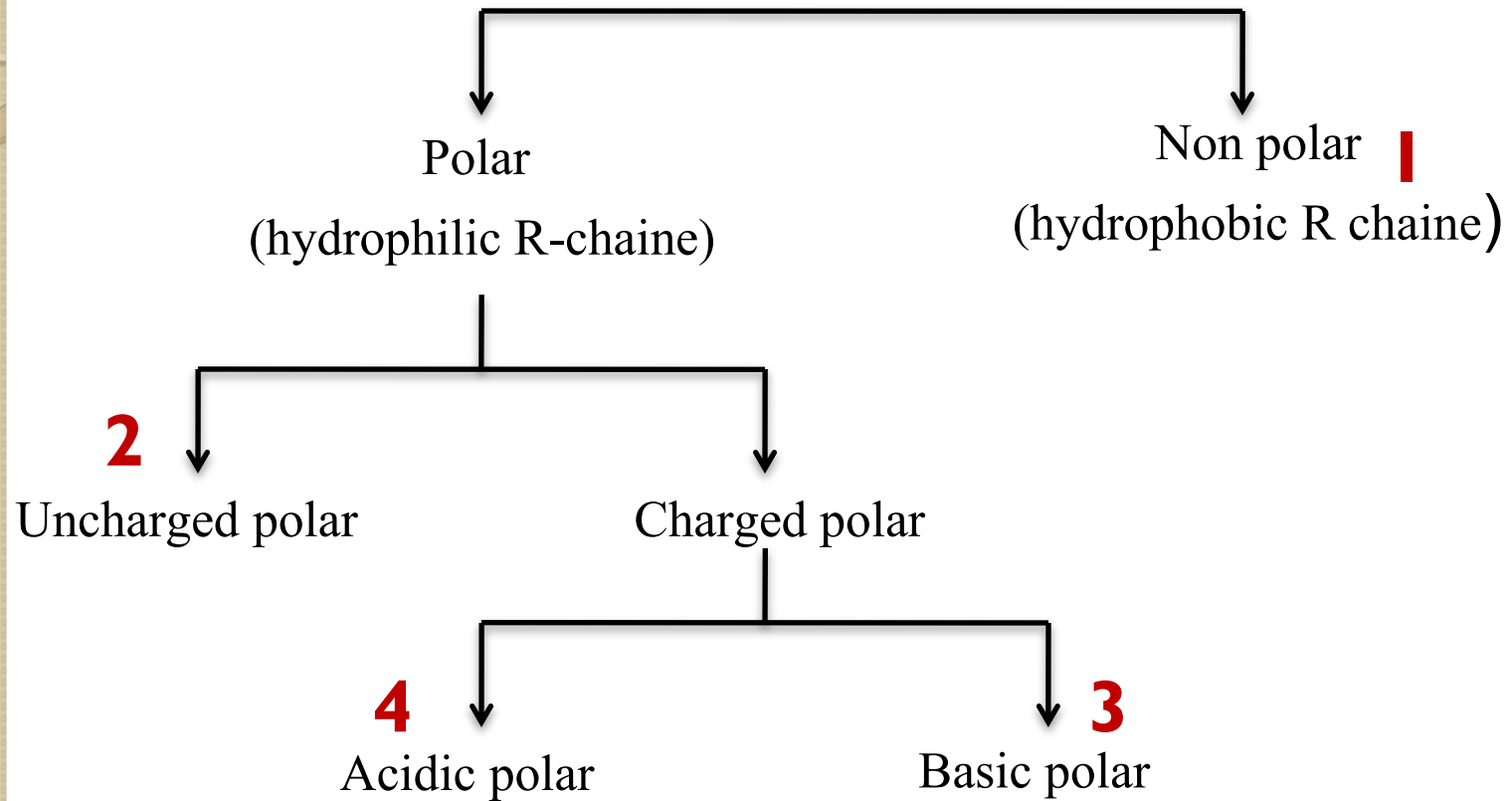
\*The simplest, and smallest, amino acid found in proteins is glycine for which the R-group is hydrogen (H).

\*All these amino acids are found in solutions in their ionized form (Zwitter ion),

\*The charge of a.a depend on PH of medium where they are located .



\*a.a Classification depend on the polarity of the R- side chaine , into 4 categories:



\*Polar amino acids are more soluble in water than non-polar, due to presence of amino and carboxyl group which enables amino acids to accept and donate protons to aqueous solution, and therefore, to act as acids and bases. A molecule that functions as such is known as **an amphoteric**.

\***isoelectric point (pI)**: The pH value at which concentration of anionic and cationic groups are equal (i.e the net charge of this molecule equals zero)

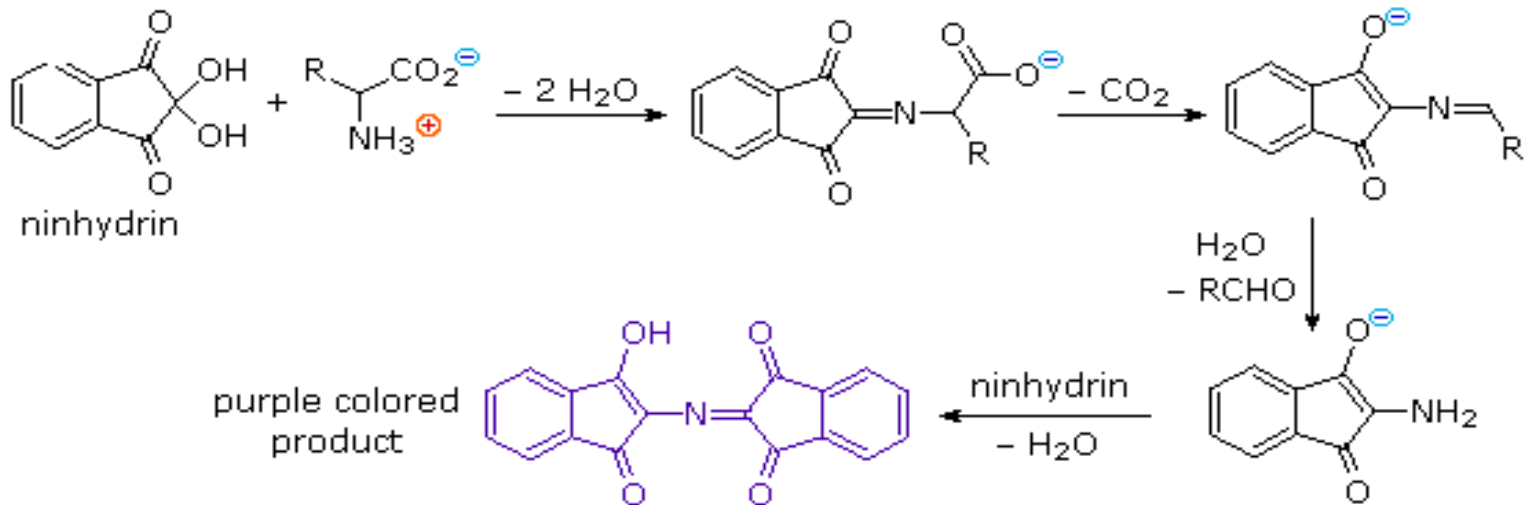
\*Amino acids are able to rotate polarized light either to the left (livo) L. or to the right (dextro) D, since they have an asymmetric C atom (a carbon atom linked to 4 different groups), glycine which lacks asymmetric C atom (has 2 H<sup>+</sup> on a alfaC) is an exception.

# Qualitative tests of amino acids:

## [1]Ninhydrin test:

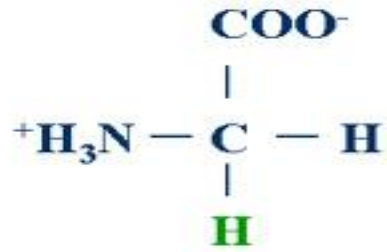
A test often used to detect -L- alfa amino acids which contain a free amino group.

### Principle:



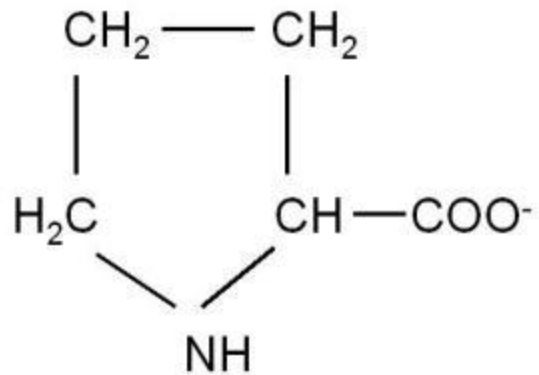
Positive result → blue -purple  
Negative result → yellow, orang...etc

**hydrindantin  
condence with  
ammonia**



Glycine

Containing free amino group



Proline

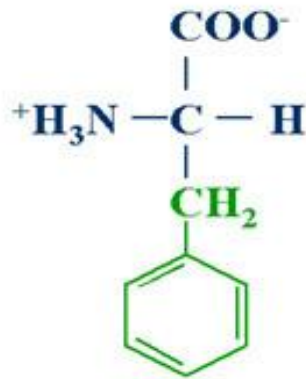
Does not contain free amino group



## [2]Xanthoproteic test

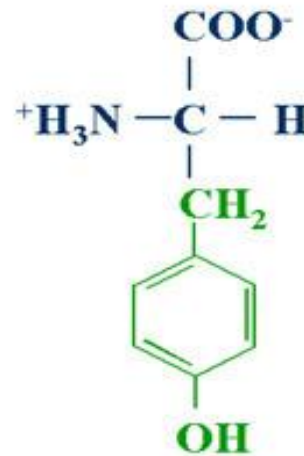
This test is used to differentiate between aromatic amino acids which give positive results and other amino acids.

**Principle:**

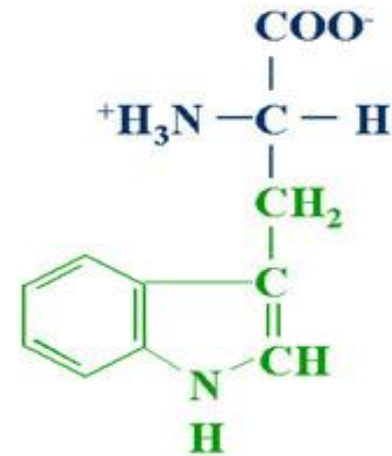


Phenylalanine

×



Tyrosine



Tryptophan

**Positive result → yellow**

### [3] Millon's test

This test is specific for tyrosine, the only amino acid containing a phenol group, a hydroxyl group attached to benzene ring.

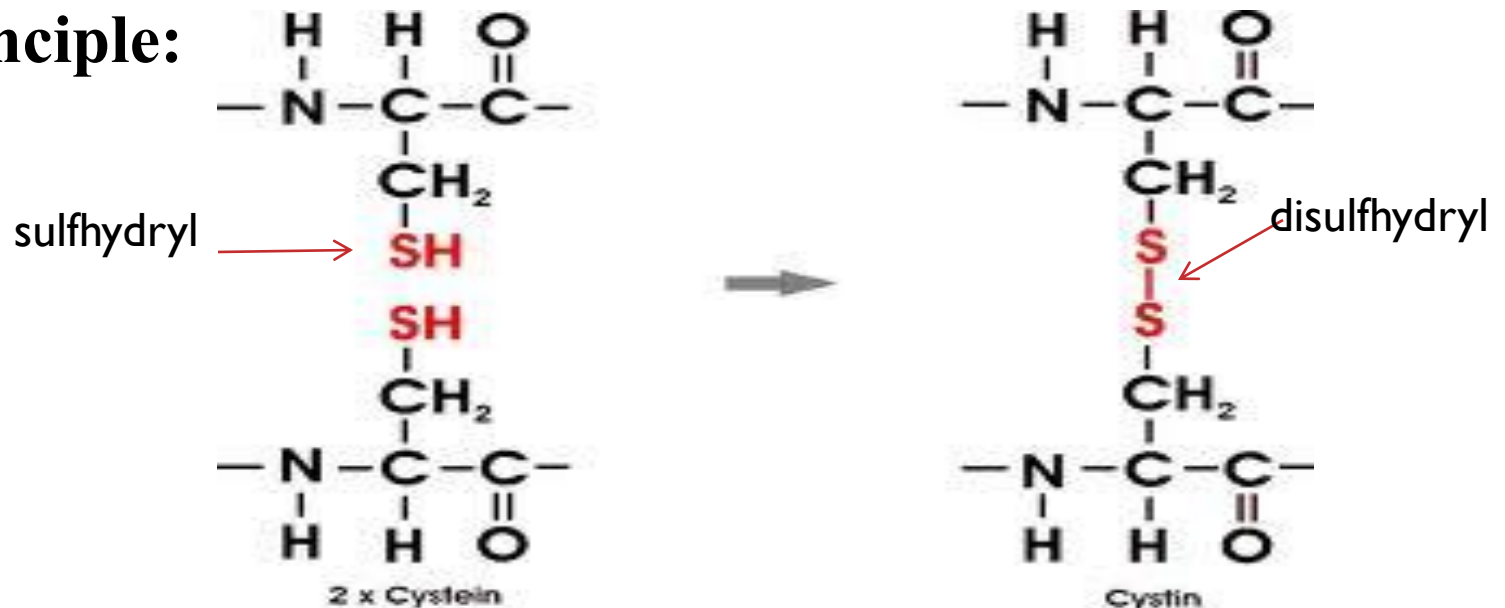
#### **Principle:**

In Milon's test, the phenol group of tyrosine is first nitrated by nitric acid in the test solution. Then the nitrated tyrosine complexes mercury ions in the solution to form a brick-red solution or precipitate of nitrated tyrosine, in all cases, appearance of red color is positive test.

## [4]Detection of amino acids containing sulfhydryl group (-SH)- Lead Sulfite Test

This test is specific for -SH containing amino acid (Cystein).

**Principle:**



**PbS(black precipitate)**

# Report:

- Title of the experiment
- Name of the test
- Objective
- Principle
- Material and method: as in the lab. Sheet
- Result
- Calculation
- Discussion
- Questions