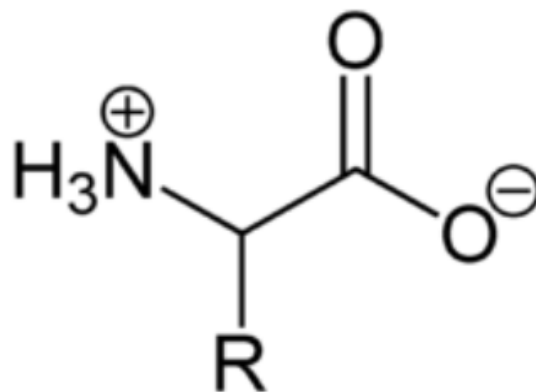




## **Polarimetric Determination of Amino Acids**

The polarimetric analysis of amino acids is required for purity and concentration measurements in food and pharmaceutical industries.



### **The geometry and optical rotation of amino acids depends on the pH**

Amino acids are the building blocks of proteins. As such they are important for food and pharmaceutical industries, e.g. as food supplements. They are characterized by a carboxyl group, an amino group, and a specific residual chain. Proteinogenic amino acids are  $\alpha$ -amino acids, which carry a carboxyl, an amine, a hydrogen and a residual chain at the  $\alpha$ -carbon, which forms a chiral center. Due to this chiral center, most  $\alpha$ -amino acids are optically active.

Depending on the pH of the solution, the carboxyl and the amino group may become deprotonated or protonated respectively. At a given pH the amino acid carries both a positive and a negative electrical charge and is referred to as zwitterion.

The charge of an amino acid and therefore its geometrical structure at the chiral center strongly depends on the pH of the solution and has a significant impact on its optical rotation.

### **Determination of optical rotation in amino acids**

As the pH strongly determines the geometrical structure of amino acids, international pharmacopoeias demand the measurement of their optical rotations in solutions with defined acidity. As polarimeter sample cells made from stainless steel are not resistant against highly concentrated acids, other sample cells must be applied to those measurements.

Anton Paar offers polarimeter tubes that are made from Hastelloy B3. Hastelloy B3 is resistant against highly concentrated acids with up to 35 % HCl.

The determination of optical rotation in amino acids is further described in the corresponding application Report "Polarimetric determination of amino acids".

### **Good to know**

Anton Paar's modular circular polarimeter MCP may be used to determine the optical rotation even in harsh acidic solutions by using sample cells made from Hastelloy B3.

### **Other Anton Paar instruments relevant for the application**

Instruments placed in harsh environments must be equipped with resistant material. Polarimetric sample cells made from Hastelloy B3 may be used for determination of optical rotation in samples with high acidity.



### **Do you have any questions?**

Contact Anton Paar directly:

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