



Polarimeter

General Applications

.Polarimetry is an instrumental analytical method using the optical activity by inorganic and organic compounds as a measure of their concentration in a solution. Optical rotation means that the polarization of the direction of light will be rotated for a certain angle when penetrating an optical active substance. This angle of rotation is absolutely determined by a polarimeter with highest precision. The measurement occurs non-destructive and is influenced by

- ◆ The sample itself
- ◆ The concentration
- ◆ The lengths of the observation tube
- ◆ The temperature
- ◆ The colour of light (wavelength)

A polarimeter is widely used in the food, chemical and pharmaceutical industries for quality control, process control and research. The most known application is the analysis of sugar using the International Sugar Scale °Z.

Some application are:

Food industries

Quality control of origin, intermediate and final products, determination of concentration and purity control.

- ◆ **Sugar industries:** sugar (sucrose, levulose, glucose...), sugar syrups, starch, sugar-free sweeteners like isomalt, ...
- ◆ **Dairy:** lactose, sucrose, lactoglobuline, lactic acid and esters,
- ◆ **Vine industries:** analysis of sugar in vine, tartaric acid and esters, ...
- ◆ **Beverage industries:** analysis of sugar, wort, ...
- ◆ **Fruit:** analysis of sugar in fruit syrups (levulose), acid and esters (malic acid...), essential oils, ...

Pharmaceutical industries

Purity control and determination of concentration from substances according to the requirements of the European and American Pharmacopeia by measurement of specific and optical rotation.

- ◆ **Alkaloids:** cocaine, codeine, nicotine, morphinsulphate, ...
- ◆ **Amino acids:** asparagine, glutamic acid, ...
- ◆ **Organic compounds:** ascorbic acid, menthol, camphor, ...
- ◆ **Others:** steroids, antibiotics, serums, vitamins, ...

Medicine

- ◆ Research of sugar and albumin in urine
- ◆ Hormone research
- ◆ Enzymology and toxicology research

Cosmetic industries

Control of purity and identity of optically active essential oils and essences like lemon oil, orange oil, lavender oil, spearmint oil,

Chemical industries

Purity control and measurement of concentration, identifying and characterization of compounds like

- ◆ Organic fluids
- ◆ Biopolymers
- ◆ Synthetic polymers
- ◆ Organic polymers

Research applications

- ◆ Analysis of optically active compounds structure analysis
- ◆ Determination of configuration changes of solved macromolecules
- ◆ Monitoring changes in concentration of an optically active component in a reaction mixture, as in enzymatic scission
- ◆ Distinction of optical isomers
- ◆ Investigating kinetic reactions by measuring optical rotation as a function of time.
- ◆ Analysing molecular structure by determination of Optical Rotation Dispersion

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