



Laboratory Refractometer

General Applications

Main uses for refractometers:

determination of the refractive index,

determination of the dry substance content (Bx),

qualitative analysis:

- identification of products (along with other physical properties: density...)

- determination of purity - the refractometric method is very sensitive: detection of pollution

 - (e.g. an add of 1% electrolyte in water means an RI modification of 10^{-3}).

- on-line control - on-line refractometers permit a continuous examination during the production,

quantitative analysis of binary mixtures, e.g. aqueous solutions of sugars, of salts...

Refractometers are often used to determine the fat content in food products after extraction and dissolution in grease solvents (α -bromonaphthalene, octane-nonane mixtures).

The field of applications is almost universal.

Food industries

Sugar industries:

measurement of the concentration of dry substance (Bx) of raw, clarified and thick juices, molasses, invert sugar and other liquids,

Sweet industries:

determination of the percentage of solids of honey, sugar solutions (sucrose), corn syrup, fruit syrups,

refractometric measurements are also used for baby foodstuffs, determination of the dry substance (or water) in marzipan, measurements of the percentage of solids in jellies, jams...

Softdrink industries:

measurements of the sugar content of fruits to determine their degree of ripeness, measurements of the percentage of solids of concentrates (oranges, apples, tomatoes...),

Breweries:

measurement of the refraction of beer to determine the alcohol, the extract and the original wort content – for this application the use of a densimeter is necessary (Schild method: a nomograph permits to determine these values),

Vine industries:

measurements of the dry substance of must (grape juice),

measurement of the dry substance of sugar solution to be added to the champagne to start the fermentation,

measurement of the refraction of wine to determine the alcohol and the extract content – the use of a densimeter is also necessary (tables),

Dairy:

determination of the RI of butter for quality control,
determination of the fat content in dairy products after extraction and dissolution of fats in grease solvents,
determination of the dry substance in yoghurt,

Chocolate-coffee industries:

determination of the total fats in chocolate and chocolate by-products (cacao bean, milk...)
examination of the purity of cacao butter,
measurement of the dry substance of coffee solutions,

Fats and oil products:

characterisation of fats and oils by determining the RI (vegetable oils, animal oils, essential oils...),
determination of total solids in liquid eggs,

Medicine Pharmacy:

measurement of the percentage of solids in serum,
measurement of the percentage of solids in urine,
purity control,

Cosmetic industries:

determination of the RI of essential oils and flavours (see ISO 280),
measurements of the fatty acids content in soaps, fragrances,

Chemical industries:

determination of the RI of raw materials, analytical reagents...
purity control – e.g. hydrocarbons (see ASTM D1218), washing agents, paints, lacquers...

Petrochemical industries:

determination of the RI of oils (mineral oils see DIN 51423), fuels...

There are thousands of yet unrevealed applications in various industries!

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Optisch-elektronische Messinstrumente seit 1864