

Kinetics of the inversion of saccharose

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Principle

The inversion reaction of saccharose, which is catalysed by protons, produces invert sugar, which is a mixture of glucose and fructose. The reaction is accompanied by a change in the optical rotation of the system. Glucose rotates the polarisation plane of linearly polarised light to the right, while inverted sugar rotates it to the left. A half-shade polarimeter is used for the measurement of the change in the angle of rotation of polarised light during the inversion reaction of saccharose over time.

Benefits

- Easy entry into polarimetry
- Combination of methodological skills and theoretical knowledge

Tasks

1. Determine the specific rotation of saccharose and lactose by measuring the rotation angle of solutions of various concentrations.
2. Determine the rate constant of the inversion of saccharose.

Learning objectives

- Reaction rate
- First order reaction
- Polarimetry
- Optical rotation

Necessary accessories

- Precision balance 620g/0.001g

Scope of delivery

Polarimeter, LED, 590 nm	35907-99	1
Immersion thermostat Alpha A, 230 V	08493-93	1
External circulation set for thermostat Alpha A	08493-02	1
Bath for thermostat, makrolon	08487-02	1
Magnetic stirrer with heater MR Hei-Standard	35753-93	1
Magnetic stirring bar 15 mm, cylindrical	46299-01	1
Magnetic stirring bar 30 mm, cylindrical	46299-02	1
Supp.rod stainl.st.,50cm,M10-thr.	02022-20	1
Retort stand, h = 750 mm	37694-00	1
Universal clamp with joint	37716-00	1
Universal clamp	37715-01	3
Right angle boss-head clamp	37697-00	4
Weighing dishes, square shape, 84 x 84 x 24 mm, 500 pcs.	45019-50	1
Digital stopwatch, 24 h, 1/100 s and 1 s	24025-00	1
Volumetric pipette, 50 ml	36578-00	7
Pipettor	36592-00	1
Pipette dish	36589-00	1
Volumetric flask, Borosilicate, 100 ml, IGJ12/21	36547-00	2
Volumetric flask, Borosilicate, 100 ml, IGJ12/21	36551-00	1
Funnel, glass, top dia. 50 mm	34457-00	1
Beaker, Boro, high-form	46026-00	10
Cristallizing dish, boro 3.3, d = 60 mm	46245-00	1
Spoon, special steel	33398-00	1
Wash bottle, plastic, 500 ml	33931-00	1
Pasteur pipettes, 250 pcs	36590-00	1
Rubber caps, 10 pcs	39275-03	1
Rubber hose	39282-00	2

Hose clip, diam. 8-16 mm, 1 pc.	40996-02	3
Hydrochloric acid, 1.0 mol/l, 1000 ml	48454-70	1
D (+)-Sucrose 100 g	30210-10	1
D(+)-Lactose, powder 100 g	31577-10	1
Water, distilled 5 l	31246-81	1
Tubing connector, ID 6-10mm	47516-01	2