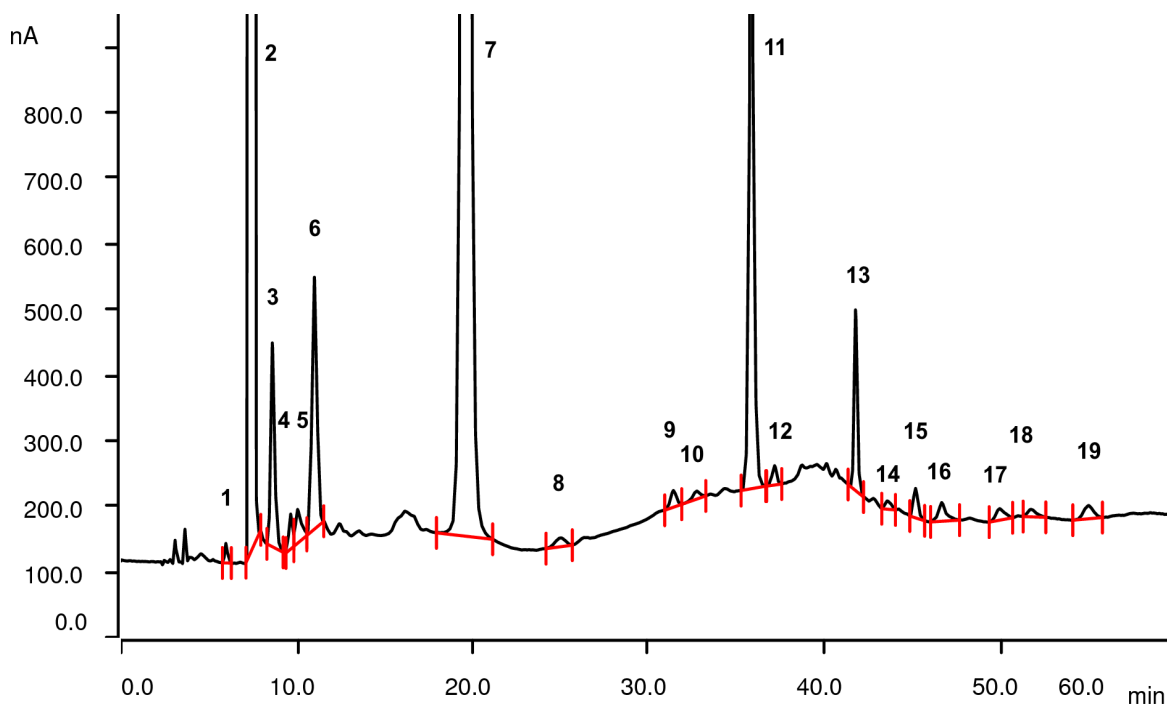


Mono-, di-, and oligosaccharides in wort

Determination of glucose, fructose, saccharose, and maltose oligosaccharides in wort applying pulsed amperometric detection (PAD) after Dose-in gradient elution.



Chromatogram of a sample of diluted beer wort.

Beer wort is the liquid in which malt starch is converted enzymatically into sugars and is additionally flavored and preserved with hops. The most important sugars for beer brewing are maltose and maltotriose, which will be fermented into alcohol by the added brewing yeast. The composition of carbohydrates in wort is determined on a Metrosep Carb 2 - 250/4.0 column applying a Dose-in gradient to optimize resolution and duration of the analysis.

Results

Sample	Concentration [g/L]	Sample	Concentration [g/L]
2 Glucose	8.50	11 Maltotriose	12.19
3 Fructose	1.49	13 Maltotetraose	-
6 Saccharose	3.80	15 Maltopentaose	0.70
7 Maltose	48.08	17 Maltohexaose	0.64

Other peaks correspond to unidentified carbohydrates.

Sample

Beer wort.

Sample preparation

The sample is filtered through a folded paper filter for degassing and diluted 1:100 with ultrapure water prior to injection.

Columns

Metrosep Carb 2 - 250/4.0	6.1090.430
Metrosep Carb 2 Guard/4.0	6.1090.500

Solutions

Eluent A	100 mmol/L sodium hydroxide 25 mmol/L sodium acetate
Eluent B	220 mmol/L sodium hydroxide 200 mmol/L sodium acetate

Instrumentation

930 Compact IC Flex Oven/Deg	2.930.2160
IC Amperometric Detector	2.850.9110
858 Professional Sample Processor	2.858.0020
IC equipment: Dose-in Gradient Anions	6.5330.150
IC equipment Wall-Jet cell: Carb (Au, Pd)	6.5337.010



Analysis

Pulsed amperometric detection

Parameters

Flow rate	0.7 mL/min
Injection volume	1.5 µL
P _{max}	20 MPa
Column temperature	30 °C
Recording time	60 min

PAD Parameters

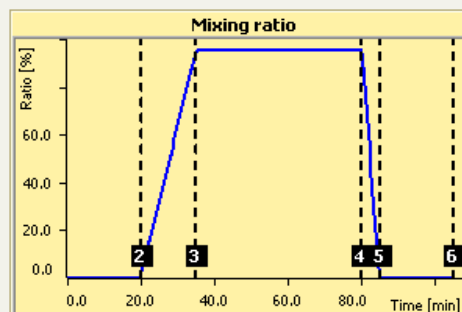
Cell	Wall-Jet cell
Working electrode	Gold
Reference electrode	Palladium
Spacer	50 µm
Measuring potential	0.05 V
Measuring duration	100 ms
Cycle duration	550 ms
Measuring range	200 µA
Temperature	35 °C
Mode	PAD

Dosino gradient

Flow mL/min

	Time [min]	Ratio [%]	Curve
▶ 1	Start	0.0	
2	20.0	0.0	Linear
3	35.0	95.0	Linear
4	80.0	95.0	Linear
5	85.0	0.0	Linear
6	105.0	0.0	Linear
7			

Total volume mL



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