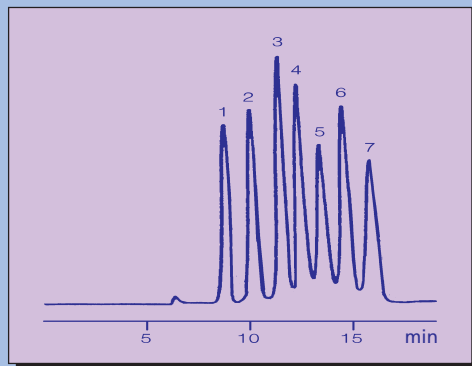


# V. Analysis of beverages and foods

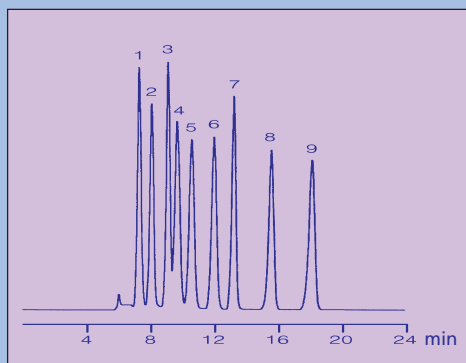
## 10 082 Analysis of Sugars in Beverages



- 1) Raffinose
- 2) Maltose
- 3) Glucose
- 4) Xylose
- 5) Galactose
- 6) Arabinose
- 7) Mannose

Column phase: GROM-RESIN ZP, 10  $\mu$ m  
 Column size: 300 x 8 mm  
 Eluent: water  
 Flow rate: 0.7 ml/min  
 Pressure: 1 MPa  
 Temperature: 70°C  
 Detection: RI  
 Injection: 15  $\mu$ l

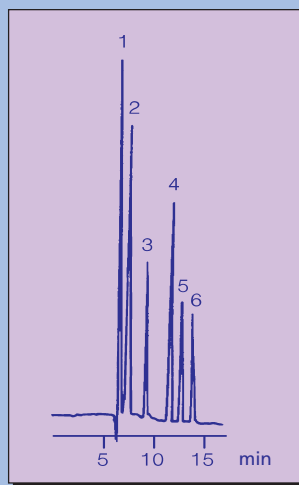
## 10 083 Analysis of Oligosaccharides and Alcohols in Food



- 1) Maltotriose
- 2) Maltose
- 3) Lactulose
- 4) Glucose
- 5) Xylose
- 6) Arabinose
- 7) Adonitol
- 8) Arabitol
- 9) Xylitol

Column phase: GROM-RESIN ZC, 10  $\mu$ m  
 Column size: 300 x 8 mm  
 Eluent: Ca<sub>2</sub>EDTA (50 mg/L H<sub>2</sub>O)  
 Flow rate: 0.7 ml/min  
 Pressure: 1 MPa  
 Temperature: 85°C  
 Detection: RI  
 Injection: 15  $\mu$ l

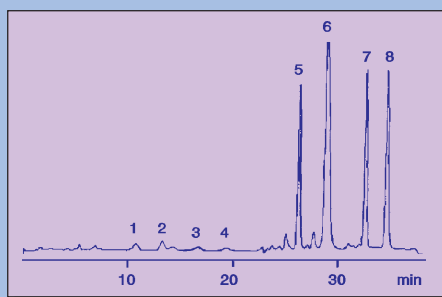
## 10 084 HPLC Determination of Organic Acids



- 1) Oxalic acid
- 2) Maleic acid
- 3) Malonic acid
- 4) Succinic acid
- 5) Formic acid
- 6) Acetic acid

Column phase: GROM-RESIN AC, 10  $\mu$ m  
 Column size: 300 x 8 mm  
 Eluent: 0.003 N sulfuric acid  
 Flow rate: 0.7 ml/min  
 Pressure: 7 MPa  
 Temperature: RT  
 Detection: conductivity  
 Injection: 20  $\mu$ l

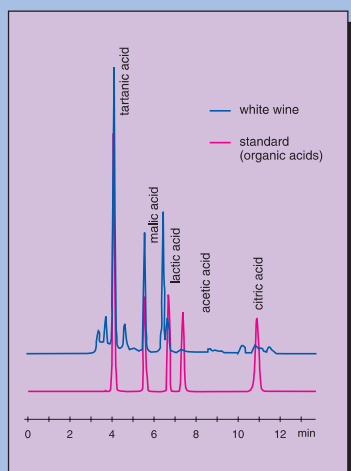
## 10 100 Determination of the Hop Bitter Acids in Beer by HPLC



- 1) Co-Isohumulon
- 2) N-Isohumulon
- 3) Ad-Isohumulon
- 4) Xanthohumulon
- 5) Co-Humulon
- 6) N/Ad-Humulon
- 7) Co-Lupulon
- 8) N/Ad-Lupulon

Column phase: GROM-Beer-Bitter (tailor-made)  
 Column size: 125 x 4 mm  
 Eluent A: MeOH  
 B: 647 ml MeOH + 349 ml H<sub>2</sub>O + 4 ml H<sub>3</sub>PO<sub>4</sub>  
 Gradient: 100% B (0-19.5 min), 65% B (19.5-29 min), 50% B (29-36 min), 100% B (36-40 min)  
 Flow rate: 1.0 ml/min  
 Pressure: 9 MPa  
 Temperature: 35°C  
 Detection (UV): 270 / 314 nm  
 Injection: 10  $\mu$ l beer

## 10 137 Analysis of Organic Acids in White Wine

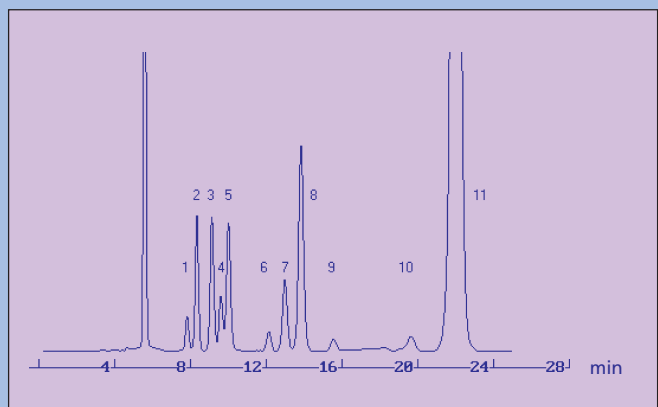
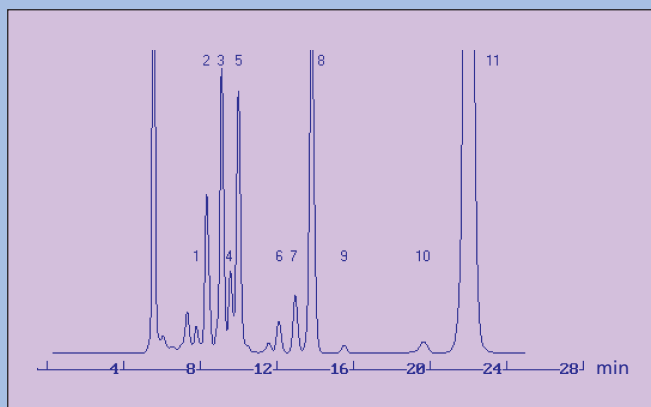
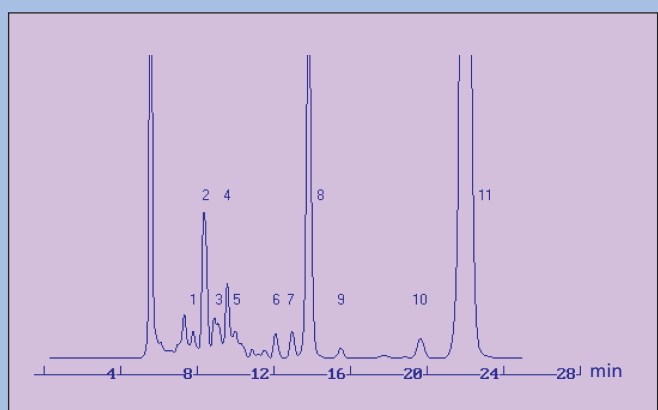
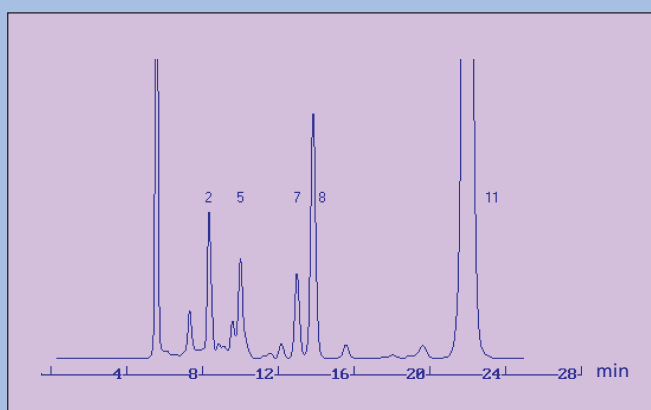


Column phase: GROM-SIL „Org. Acids“, 5  $\mu$ m  
 Column size: 250 x 4 mm  
 Eluent: 20 mM Na-phosphate, pH 2.8  
 Flow rate: 0.5 ml/min  
 Pressure: 9.5 MPa  
 Temperature: RT  
 Detection (UV): 220 nm  
 Injection: 20  $\mu$ l (0.1 to 0.2  $\mu$ g/ml of each)



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# Analysis of wines by HPLC

**10 085 a Wine Standard**

**10 085 b Red Wine (sweet)**

**10 085 c Red Wine (dry)**

**10 085 d White Wine with Biological Degradation of Acids**


**Column phase:** GROM-RESIN ZH, 10  $\mu\text{m}$  + guard column  
**Column size:** 300 x 8 mm  
**Eluent:** 2.5 mM  $\text{H}_2\text{SO}_4$   
**Flow rate:** 0.6 ml/min  
**Pressure:** 1MPa  
**Temperature:** 60°C  
**Detection:** RI  
**Sample:** wine, diluted 1:10 with 10 mM  $\text{H}_2\text{SO}_4$

1) Citric acid                      7) Lactic acid  
 2) Tartaric acid                8) Glycerol  
 3) Glucose                        9) Acetic acid  
 4) Malic acid                    10) 2,3-Butanediol  
 5) Fructose                      11) Ethanol  
 6) Succinic acid

Analysis of	Field of application *	Column dimensions	Order number
Monosaccharides	Foodstuff industry, Nutrition sciences	300 x 8 mm column	GP ZP 1 1012 S 3008
Mono- and disaccharides, sugar alcohols	Fermentation control/ breweries	300 x 8 mm column	GP ZC 1 1012 S 3008
Sugars, alcohols, organic acids	Beverage industry (Viticulture / Enology)	300 x 8 mm column	GP ZH 1 1012 S 3008
Organic acids	Beverage industry	300 x 8 mm column	GP AC 1 1012 S 3008
Hop bitter acids	Beverage industry	125 x 4 mm column	GS BI 1 0712 S 1204

\* Further applications concerning the analysis of beverages and food see also pages 19–22