

# Component analysis using “Magic Chemisorber®”

## 8. Natural grapefruit juice

**[Background]** Identification of flavor compounds by solid phase extraction (SPE) using Magic Chemisorber® is described for the analysis of natural grapefruit juice.

**[Experimental]** Magic Chemisorber® MC-S500 (PDMS thickness 500 µm) was immersed in 10 mL of grapefruit juice for 30 min at 22°C. Then, the surface of the Chemisorber was cleaned using KimWipes prior to the analysis. The Magic Chemisorber® was placed in a flow-through Eco-cup LHF, and heated to 250°C for 15 min. Thermally desorbed compounds were swept by a carrier gas to the GC injection port configured for splitless operation. The desorbed compounds were once cryo-trapped at the head of the separation column using a MicroJet Cryo-Trap, and then they were sent to the separation column and detected by a quadrupole MS detector.

**[Results]** A chromatogram of the extracted compounds from the grapefruit juice is shown in Fig. 1, and peak assignments are summarized in Table 1. Various components contained in the grapefruit juice were observed including limonene and nootkatone. The results show that the use of the Magic Chemisorber® and the pyrolyzer configured for thermal desorption is a quick and simple technique for analyzing flavor components in liquid samples.

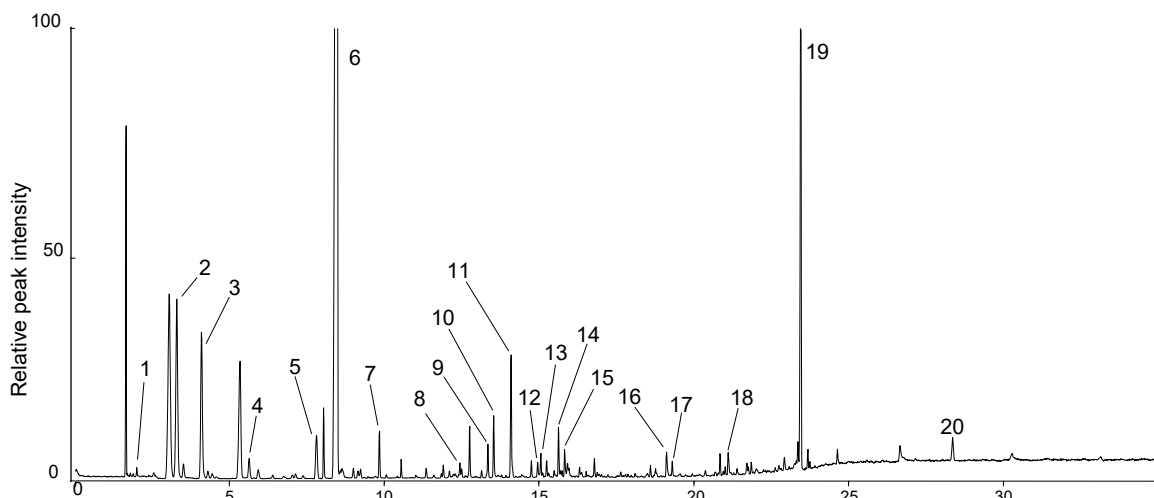


Fig. 1 Chromatogram of extracted compounds from grapefruit juice by Magic Chemisorber®

Sample amount: 10 mL, Extraction: 30 min immersion at 22°C  
 Thermal desorption temp.: 250°C (15 min hold), cryo-trapped with MicroJet Cryo-Trap  
 Separation column: Ultra ALLOY-CW (polyethylene glycol 20M), L=30 m, i.d.=0.25 mm, df=0.25 µm  
 Column flow rate: 1 mL/min, Splitless mode, GC oven temp.: 40°C (3 min hold) - 250°C (10 °C/min, 30 min hold)

Table 1 Components extracted from grapefruit juice

#	Compound	#	Compound	#	Compound
1	Acetaldehyde	9	Linalool	17	Elemol
2	Ethyl acetate	10	n-Octanal	18	Decanoic acid
3	Ethanol	11	β-Caryophyllene	19	Nootkatone
4	Ethyl butanoate	12	α-Humulene	20	Hexadecanoic acid
5	β-Myrcene	13	Neral		
6	Limonene	14	Geranial		
7	Octanol	15	Geranyl acetate		
8	Octyl acetate	16	Octanoic acid		

Ref: [L. Wang et al., J. Chromatogr. A 1035 \(2004\) 277-279.](#)

**Keywords :** Solid phase extraction, immersion method, thermal desorption GC/MS, grapefruit juice

**Products used :** Multi-functional pyrolyzer, Magic Chemisorber®, MicroJet Cryo-Trap, UA-CW, Flow through Eco-cup LHF

**Applications :** Brewing, Food component analysis

**Related technical notes :** [MCA-001E](#), [MCA-002E](#)

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