

Components analysis using “Magic Chemisorber®”

2. Head space analysis of kimchi flavor components

[Background] Headspace method based on solid phase extraction (SPE). using Magic Chemisorber® is described for the analysis of the flavor components in kimchi (Korean pickles).

[Experimental] Magic Chemisorber® MC-S500 (PDMS thickness 500 µm) was held in the headspace of a 10 mL vial, which contained 3 g of kimchi, for 120 min at 24°C. The Magic Chemisorber® was then placed in a flow through Eco-cup LHF, and volatile compounds were thermally desorbed at 250°C for 15 min in the pyrolyzer furnace. Thermally desorbed compounds were introduced to the GC injection port configured in the splitless mode. The compounds were cryo-trapped at the head of a separation column using MicroJet Cryo-Trap before starting the GC/MS analysis.

[Results] A chromatogram of the kimchi flavor components extracted by the Magic Chemisorber® is shown in Fig. 1, and the peak assignments are summarized in Table 1. Various components contained in kimchi were observed including dimethyl disulfide and methyl allyl disulfide. The results show that the Magic Chemisorber® and the pyrolyzer configured for thermal desorption allow quick and simple analysis of flavor components contained in kimchi.

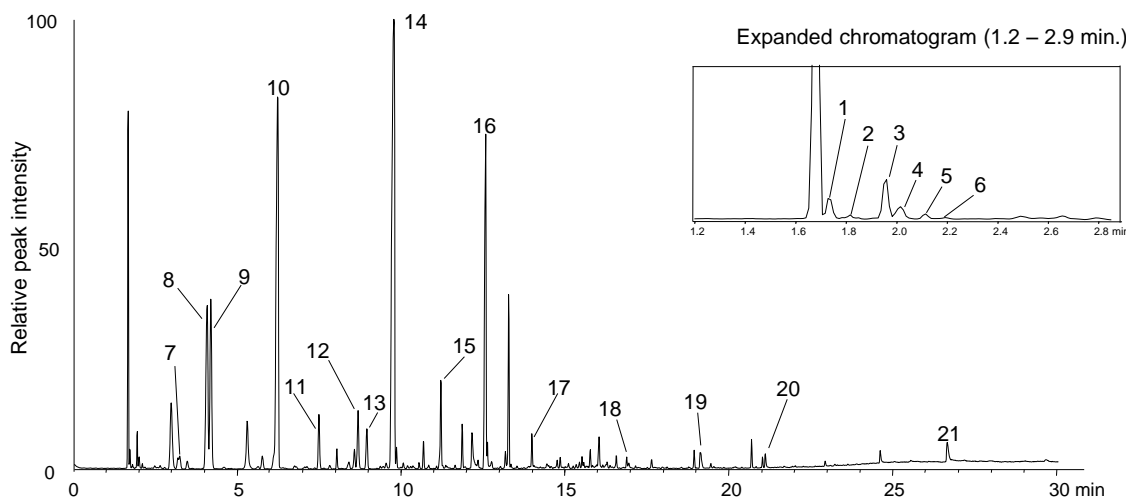


Fig. 1 Chromatogram of headspace components of kimchi extracted by Magic Chemisorber®

Sample amount: 3 g, Extraction: 120 min suspension in headspace of 10 mL vial at 24°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 kimchi

#	Compound	#	Compound	#	Compound
1	Hydrogen sulfide	8	Ethanol	15	Dimethyl trisulfide
2	Formaldehyde	9	Allyl methyl sulfide	16	Allyl disulfide
3	Methyl mercaptan	10	Dimethyl disulfide	17	Methyl allyl trisulfide
4	Acetaldehyde	11	Allyl sulfide	18	Geraniol
5	Carbon disulfide	12	1,8-Cineole	19	Octanoic acid
6	Dimethyl sulfide	13	Methyl propyl disulfide	20	Decanoic acid
7	Ethyl acetate	14	Methyl allyl disulfide	21	Hexadecanoic acid

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

Keywords : Solid phase extraction, headspace, thermal desorption GC/MS, kimchi, flavor components, sulfur compounds

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

Applications : Food component analysis, additives analysis

Related technical notes : MCA-001E, MCA-002E

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