

# Flavor component analysis using non-polar and polar Magic Chemisorber®

## 2. Barley shochu (Japanese barley spirit)

**[Background]** Flavor components in barley shochu (Japanese barley spirit) were analyzed by direct immersion sampling with solid phase extraction devices "Magic Chemisorber MC-S500" and "Polar Magic Chemisorber MC-PEG-S".

**[Experimental]** Nonpolar Magic Chemisorber® MC-S500 was attached to an Eco-Stick DF and immersed in 5.0 mL of barley shochu containing 1.0 g of NaCl for 30 min at room temperature (stirring speed: 600 rpm). Then, the Magic Chemisorber® was briefly rinsed with distilled water and wiped with a clean paper tissue. It was then heated in a pyrolyzer furnace programmed from 100 to 230 °C (3 min hold) with a ramp rate of 40 °C/min. The thermally desorbed compounds were cryo-trapped at the head of a separation column using a MicroJet Cryo-Trap. Then the trapped volatiles were separated and detected by GC/MS. Likewise, analysis was done using the polar Magic Chemisorber® MC-PEG-S in an identical manner.

**[Results]** The chromatograms of the compounds extracted from barley shochu by nonpolar and polar Magic Chemisorbers are shown in Fig. 1. The results of identification of major peaks are summarized in Table 1. Ethyl esters of fatty acids (8, 9) and phenethyl acetate (10) were mainly extracted by The non-polar Magic Chemisorber. On the other hand, ethanol (3) and phenethyl alcohol (11) were mainly extracted by the polar Magic Chemisorber.

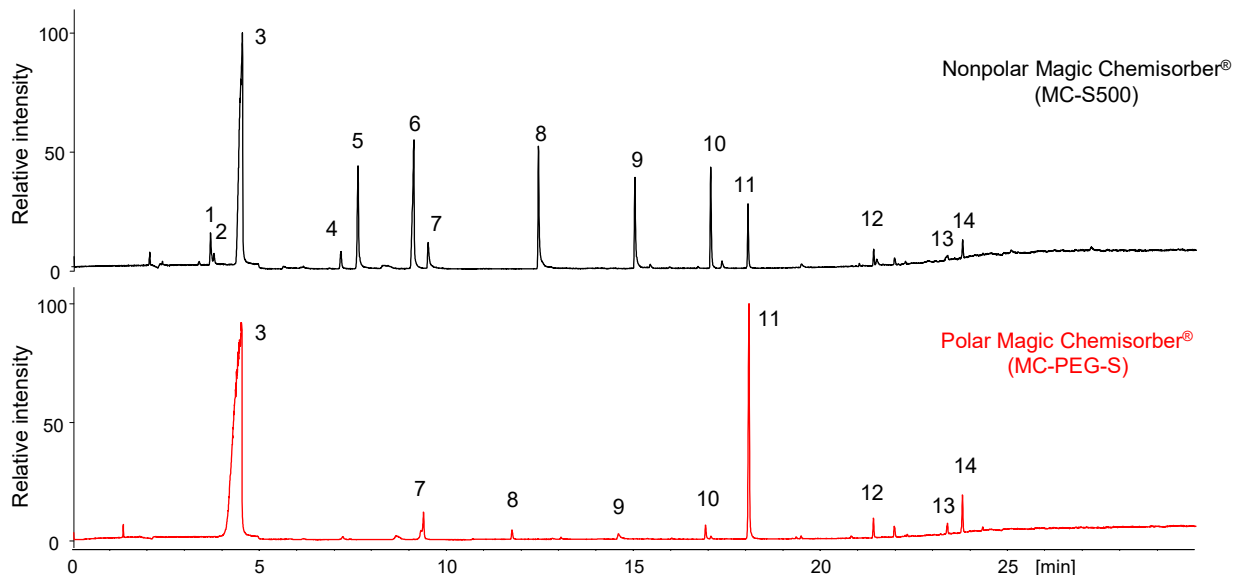


Fig. 1 Chromatograms of compounds extracted from barley shochu by nonpolar and polar Magic Chemisorbers (immersion sampling)

Sample: Barley shochu 5.0 mL + Sodium chloride 1.0 g, Extraction: 30 min immersion at 25 °C (stirring speed 600 rpm)  
 Thermal desorption temp.: 100 - 230 °C (40 °C/min, 3 min hold), Cryo-trapped with MicroJet Cryo-Trap  
 Separation column: Ultra ALLOY-CW (polyethylene glycol), L= 30 m, i.d.= 0.25 mm, df= 0.25 µm,  
 Column flow rate: 1 mL/min, Split ratio: 1/5, GC oven temp.: 40 °C (3 min hold) - 250 °C (10 °C/min, 14 min hold)

Table 1 Compounds extracted from barley shochu

#	Compound	#	Compound
1	Ethyl acetate	8	Ethyl octanoate*
2	1,1-Diethoxyethane	9	Ethyl decanoate*
3	Ethanol	10	Phenethyl acetate*
4	Isobutyl alcohol*	11	Phenethyl alcohol*
5	Isoamyl acetate*	12	Ethyl palmitate*
6	2-Methyl-1-butanol Isoamyl alcohol*	13	Ethyl oleate*
7		Ethyl hexanoate*	14

**Keywords :** Solid phase extraction, Polar sorbent, PEG, Immersion sampling, Thermal desorption GC/MS, Barley spirit

**Products used :** Multi-functional pyrolyzer, Magic Chemisorber® MC-S500, Magic Chemisorber® MC-PEG, MicroJet Cryo-Trap, UA-CW

**Applications :** Brewing, Food component analysis

**Related technical notes :** [MCA-011E](#)

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