# Solid phase extraction using new Polar Magic Chemisorber®
## 1. Flavor components in red wine

**[Background]** Compounds in red wine were extracted by a new Magic Chemisorber® MC-PEG and were subsequently thermally desorbed, separated using gas chromatography and detected by a mass spectrometer (MS).

**[Experimental]** A Polar Magic Chemisorber® MC-PEG (film thickness of PEG: 30 µm, volume: 3.8 µL) was placed onto an Eco-Stick GD and immersed in 5.0 mL of a red wine (with 1.0 g of sodium chloride) for 30 min at 25 ºC. After 30 min, the Magic Chemisorber® was briefly rinsed with distilled water and wiped with a clean paper tissue. The Magic Chemisorber® was positioned in the pyrolyzer furnace and heated: 100 - 230 ºC (3 min hold). Thermally desorbed compounds were swept by the helium carrier gas to the GC injection port. The desorbed compounds were cryo-trapped at the head of the separation column (UA-CW) using a MicroJet Cryo-Trap. Then, the trap was heated, and the trapped volatiles were separated on the separation column and detected by a quadrupole mass detector. For comparison, the analysis was similarly performed using the nonpolar Magic Chemisorber® MC-S500.

**[Results]** Chromatograms of the extracted compounds from the red wine are shown in Fig. 1, and peak assignments are summarized in Table 1. Various polar components, including glycerol and phenethyl alcohol were observed in the chromatogram. The results show that the use of the Magic Chemisorber® MC-PEG and the pyrolyzer configured for thermal desorption is a quick and simple technique for analyzing polar components in liquid samples.

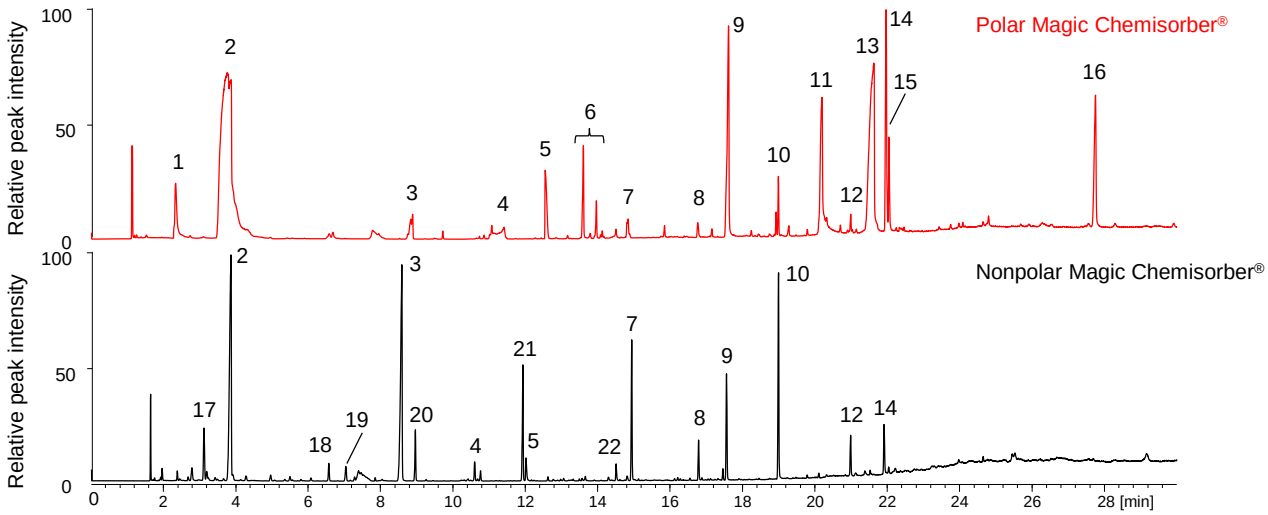


Fig. 1 Chromatograms of extracted compounds (immersion method) from red wine by polar and nonpolar Magic Chemisorber®

Sample amount: 5.0 mL with 1.0 g of NaCl, Extraction: 30 min immersion at 25 ºC (stirring speed 600 rpm)
Thermal desorption temp.: 100 - 230 ºC (40 ºC/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 ºC (3 min hold) - 250 ºC (10 ºC/min, 14 min hold)

Table 1 Compounds extracted from red wine (compounds extracted only by polar Magic Chemisorber® are shown in red)

| # | Compound | # | Compound | # | Compound |
|---|---|---|---|---|---|
| 1 | Sulfur dioxide | 8 | Hexanoic acid | 16 | *p*-Hydroxyphenethyl alcohol (Tyrosol) |
| 2 | Ethanol | 9 | Phenethyl alcohol | 17 | Ethyl acetate |
| 3 | 2-Methyl-1-butanol + Isoamyl alcohol | 10 | Octanoic acid | 18 | Isobutyl alcohol |
| 4 | Ethyl lactate | 11 | Lactic acid | 19 | Isoamyl acetate |
| 5 | Acetic acid | 12 | Decanoic acid | 20 | Ethyl hexanoate |
| 6 | 2,3-Butanediol | 13 | Glycerol | 21 | Ethyl octanoate |
| 7 | Diethyl succinate | 14 | Monoethyl succinate | 22 | Ethyl decanoate |
| | | 15 | Coumaran | | |

**Keywords :** Solid phase extraction, Polar sorbent, PEG, Immersion method, Thermal desorption GC/MS, Red wine

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

**Applications :** Brewing, Food component analysis

**Related technical notes :** MCA-002E

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