Analysis of Odors in Surface Water with SPME-GC-MS

Application Note

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Introduction

The presence of algae, especially green-blue algae, together with some bacteria in surface water, can cause problems for drinking water supplies. This is due to the release of certain organic chemicals from algal or bacteria cells occurring either during normal metabolic processes or following cell rupture after the organism dies. These chemicals may cause off-odors and affect taste with implications for the drinking water treatment. Their development is dependent on temperature, sunlight and the age of the algae. The occurrence of trichlorophenol in the water is a result of the use of chlorine for disinfection purposes.

The analysis of these relatively volatile compounds in surface water can be performed by Headspace-SPME/GC/MS using a polyethylene glycol liquid phase column, such as the Agilent J&W FactorFour VF-WAXms, for optimal polar selectivity.

Components	RT (min)	Mode	Detection Limit (ng/L)
Camphen	8.17	SIM	5
Limonen	11.30	FS	100
Cineol	11.60	FS	100
Isopropyl-methoxypyrazin	17.61	SIM	2
Isobutyl-methoxypyrazin	17.73	SIM	2
Campher	17.74	FS	100
2-Methyl-isoborneol	18.72	SIM	6
Beta-cyclocitral	19.16	SIM	10
Geranylaceton	21.48	FS	100
2,4,6-Trichloranisol	21.57	SIM	1
Geosmin	21.84	SIM	3
Beta-ionon	22.88	SIM	5

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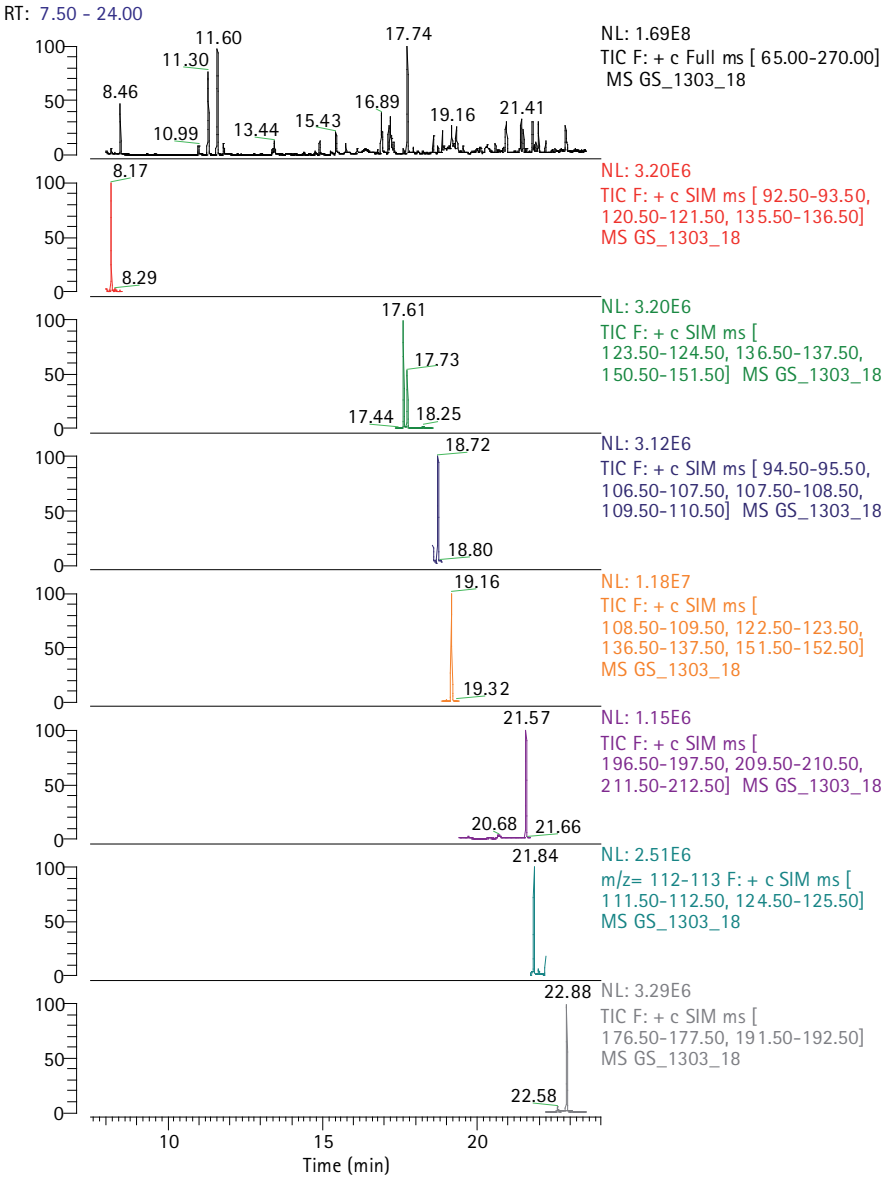
Conditions

Column:	VF-WAXms, 60 m x 0.25 mm x 0.25 µm (part number CP9207)	Detection:	MS-Quadrupol, full scan + SIM mode, TL=250 °C
Sample Size:	10 mL + 3 g NaCl in 22 mL Headspace-Vial	Extraction:	60 min rapid stirring, 60 °C Headspace
Carrier Gas:	Helium, 1.5 mL/min, constant flow	Fiber:	2 cm StableFlex 50/30 µm DVB/ Carboxen/PDMS
Injector:	SPME-Faser, splitless 3 min, 250 °C		
Temperature:	60 °C/2 min - 4 °C/min-90 °C - 10 °C/min - 250 °C		



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(data courtesy of Zentrallabor der Südsachsen Wasser GmbH, Chemnitz)

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