Automated Solid-Phase Extraction (SPE) of Triclosan in River Water

Introduction

In recent years, there has been some concern about the levels of triclosan found in drinking water. Triclosan is an antibacterial compound used in a wide range of detergents, soaps, creams, and kitchen sprays. Such widespread use of triclosan requires the need to screen drinking water for the presence of this compound.

Instrumentation Used for Sample Preparation

Thermo Scientific™ Dionex™ AutoTrace™ 280 Solid-Phase Extraction SPE instrument.

Sample Preparation

- A 500 mL sample of river water is taken for the analysis and mixed with 325 mL of methanol to prevent the triclosan sticking to the glass bottle.
- The solvent dichloromethane is used as an eluent. Collection is done in a 14 mL vial.
- Thermo Scientific™ Dionex™ SolEx™ SPE C18, 6 mL Cartridge, with 1.0 g of packing (P/N 074410).

Solvents

- Isopropyl alcohol (pesticide quality or equivalent)
- Cyclohexane (pesticide quality or equivalent)
- Extraction solvent: 2.5% (v/v) cyclohexane in isopropyl alcohol (IPA)

Dionex AutoTrace 280 SPE Method and Conclusion

All solvent lines are purged and primed with solvent first. A maximum of five solvents can be used to run a wide range of methods. Independent lines separate the aqueous and organic waste solvents. The instrument sample rack has six positions that can take volumes from 10 mL to 2000 mL and six sample collection positions for the eluent. This method offers an automated rugged and reproducible solution for cleaning up the samples to concentrate and remove interferences.

No.	Method: Estimated time 1 h 29 min
1	Process six samples using the following method steps:
2	Wash syringe with 10.0 mL of DCM.
3	Condition column with 10.0 mL of DCM into solvent waste.
4	Wash syringe with 10.0 mL of CH_3OH.
5	Condition column with 10.0 mL of CH_3OH into solvent waste.
6	Wash syringe with 10.0 mL of acidified water into aqueous waste.
7	Wash syringe with 5.0 mL of CH_3OH.
8	Load 825.0 mL of sample into column.
9	Dry column with gas for 30.0 min.
10	Wash syringe with 10.0 mL of CH_3OH.
11	Wash syringe with 10.0 mL of DCM.
12	Collect 6.0 mL fraction into sample tube using DCM.
13	Collect 6.0 mL fraction into sample tube using DCM.
14	End.

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Parameters	
Flow Rates	
Cond Flow:	15.0 mL/min
Load Flow:	10.0 mL/min
Rinse Flow:	20.0 mL/min
Elute Flow:	5.0 mL/min
Cond Air Push:	15.0 mL/min
Rinse Air Push:	20.0 mL/min
Elute Air Push:	5.0 mL/min
SPE Parameters	
Push Delay:	5 sec
Air Factor:	1.0
Autowash Vol.:	1.00 mL
Instrument Parameters	
Max. Elution Vol.:	12.0 mL
Exhaust Fan On:	Yes
Beeper On:	Yes

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