

Automated Solid Phase Extraction (SPE) of Endocrine Disruptors in Water

INTRODUCTION

Endocrine disrupting compounds (EDCs) include a wide range of compounds that have the potential to interfere with the body's endocrine system by disrupting the function of natural or endogenous hormones. Examples of potential EDCs include pesticides, such as DDT, dioxins and dioxin-like compounds, polychlorinated biphenyls, flame retardants, and plastic additives. Drinking water supplies need to be tested for the presence of EDCs because of their effect on hormones. The AutoTrace® SPE method described in this Application Brief (AB) provides a quick and simple means of concentrating the components using controlled flow rates and volumes that will consistently produce good recoveries.

INSTRUMENTATION USED FOR SAMPLE PREPARATION

Dionex AutoTrace instrument

SAMPLE PREPARATION

- A 500 mL sample of water is taken for the analysis.
- Screen for the presence of octylphenol, nonylphenol, octachlorostyrene, butylbenzylphthalate, diazinon, BPA, BHA, and BHT.
- A 3 mL SPE cartridge packed with end capped C8 or C18 sorbent.
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- The solvents methyltertbutylethylene (MTBE) and dichloromethane are used as eluents.
- The eluent can be dried using an in-line anhydrous sodium sulphate cartridge.

AUTOTRACE 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 44 min
1	Process six samples using the following method steps:
2	Condition the column with 5.0 mL of dichloromethane into solvent waste.
3	Condition column with 5.0 mL of MTBE into solvent waste.
4	Condition column with 5.0 mL of CH ₃ OH into solvent waste.
5	Condition column with 5.0 mL of DI water into aqueous waste.
6	Load 500.0 mL of sample into column.
7	Rinse column with 5.0 mL of DI water into aqueous waste.
8	Wash syringe with 5.0 mL of CH ₃ OH/MTBE 10:90.
9	Dry column with gas for 15.0 min.
10	Collect 5.0 mL fraction into sample tube using CH ₃ OH/MTBE 10:90
11	Collect 5.0 mL fraction into sample tube using dichloromethane.
12	Wash syringe with 5.0 mL of CH ₃ OH.
13	End

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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