

Analysis of various trace contaminants in large water volumes using **AttractSPE™ Disks – HLB** – Comparison with competitor HLB SPE Disks



Caffeine, Diclofenac and Metolachlor ESA are active substances in diverse fields of application such as drugs, psychoactive molecules or organochlorinated pesticides. They have very different physicochemical properties. Caffeine and Metolachlor ESA are very soluble molecules in water compared to Diclofenac.

AttractSPE™ Disks – HLB is a thin, dense and uniform extraction medium allowing the best interactions with analytes and a maximal flow rate without any channeling.

In this application, **AttractSPE™ Disks – HLB** has been tested for the analysis of these compounds at very low concentration (200ng/L for each compound) and with a high volume of loading (2L). It offers a good solution for fast enrichment of large volume of water at trace levels with a high flow rate. The same application has been done with another commercialized HLB SPE disk.

Loading solution: 2L of water were spiked at 200ng/L with each molecule (Caffeine, Diclofenac and Metolachlor ESA).

INSTALLATION AND CONDITIONING

- Put the SPE disk on the holder
- 50 mL of methanol
- 50 mL of ultrapure water

LOADING

- 2 L of loading solution

WASHING

- 50 mL of ultrapure water

ELUTION

- 40-50 mL of methanol

ANALYSIS

- Dilution by 10 with ultrapure water and analysis



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Conditions of analysis for Caffeine and Diclofenac:

LC-MS/MS HPLC U3000 - QTRAP 4000. Column: Hypersil Gold 150x2.1cm 3µm, pre-column (hypersil gold 1cm) at 30°C. Injection volume: 20 µL. Gradient: Water with 0.1% Formic acid and Acetonitrile with 0.1% Formic acid. Flow rate: 0.3 mL/min.

Conditions of analysis for Metolachlor ESA:

LC-MS/MS HPLC U3000 - QTRAP 4000. Column: Hypersil Gold 150x2.1cm 3µm, pre-column (hypersil gold 1cm) at 30°C. Injection volume: 20 µL. Gradient: Water with 0.01% Formic acid and Acetonitrile. Flow rate: 0.3 mL/min.

Table: Results obtained for the loading of 2 L of solution at a concentration of 200 ng/L

		Recovery yield (%)		
		Caffeine	Diclofenac	Metolachlor ESA
Blank solution	SPE Disks			
	AttractSPE™ Disks HLB	No trace	No trace	No trace
	Competitor HLB SPE disks	No trace	No trace	No trace
Spiked solution	AttractSPE™ Disks HLB	98	102	88
	Competitor HLB SPE disks	51	33	13

Conclusion :

AttractSPE™ Disks HLB show excellent performance for the enrichment of these molecules which have very different physicochemical properties. Very good retention and excellent recoveries were obtained even after the loading of this high amount of water. In addition, physical properties remained unchanged showing a good mechanical resistance.

Product reference:

AttractSPE™ Disks HLB - 47mm diameter, 20/pk : **SPEDisks-HLB-47.T1.20**