

Research Stays 2014

Optimization of the VAC-HSSPME experimental parameters to determine emerging contaminants in water by GC-MS

October 1st, 2014 | November 30th, 2014

Objectives

The objective was the optimization of a vacuum-Head Space-Solid Phase Microextraction (VAC-HSSPME) method to determine 5 PAHs (naphthalene, acenaphthene, fluorene, phenanthrene, and fluoranthene), and their degradation products in water samples.

Several parameters that may affect extraction were tested and optimized in order to obtain efficient responses.

Finally, the obtained results were compared with classical HSSPME in order to demonstrate a improvement in terms of extraction efficiency applying vacuum.

Methodology

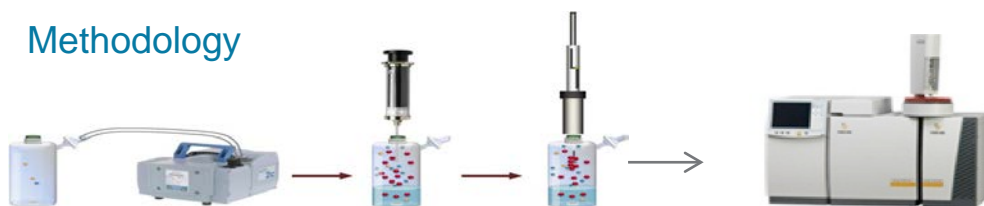


Figure 1. VAC-HSSPME procedure

Tested parameters	Studied levels	Optimal conditions
SPME fibers	DVB/CAR/PDMS and PDMS	PDMS
Vacuum time	(15, 30, 40, 60) seconds	30 seconds
Equilibrium time (before extraction)	(5, 10, 15) minutes	10 minutes
Extraction time	(5, 10, 15, 20, 30, 40, 50, 60) minutes	30 minutes
Extraction temperature	(25, 40, 60, 80, 100) °C	25°C

Results

- 5 mL of Milli Q water spiked with 10 ng mL⁻¹ of target compounds were employed to carry out the experiments

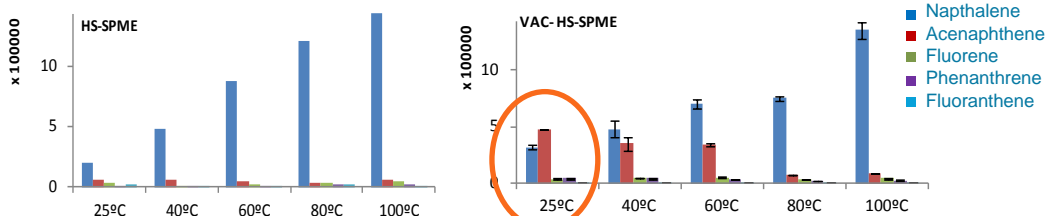


Figure 2. Comparison between HSSPME and VAC-HSSPME procedure

Highlights

Best responses were obtained working under vacuum at room temperature.

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