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### Original Article

#### Trace Analysis of Xylene in Occupational Exposures Monitoring

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#### Abstract:

**Background:** Determination of organic pollutants usually requires extraction of the pollutants from samples, using hazardous solvent. Solid phase micro-extraction (SPME) is a solvent-free equilibrium extraction method, in which, proper calibration can allow quantitative measurements of organic pollutants at a very good sensitivity without the use of any organic solvent. Because individual VOCs are generally present in urine only at trace levels, a sensitive and accurate determination technique is essential.

**Methods:** This study describes the optimization of headspace solid phase micro-extraction (HS-SPME) followed by gas chromatography equipped with flame ionization detector (GC-FID) for xylene in spiked urine. Through this investigation, the parameters affecting the extraction and GC determination of xylene, including extraction time, temperature, desorption temperature, desorption time, salt addition, sample pH, sample volume and sample agitation were studied.

**Results:** An optimized headspace extraction was carried out at 30°C for 6 min in presence of 0.2 gml<sup>-1</sup> of NaCl in the sample solution. Desorption of the xylene was carried out for 60 sec. at 250°C. The optimized procedure was also validated with three different pools of spiked urine samples and showed a good reproducibility over six consecutive days as well as six within-day experiments. In this study, the accuracy, linearity, and detection limits were also determined.

**Conclusion:** The HS-SPME-GC-FID technique provided a relatively simple, convenient, practical procedure, which can be successfully applied for determination of xylene in spiked urine when an occupational exposure monitoring is required.

#### Keywords:

*Headspace* , *Solid phase microextraction* , *Gas chromatography* , *Xylene*

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