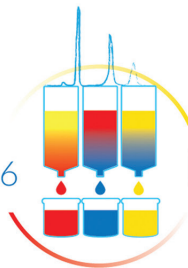


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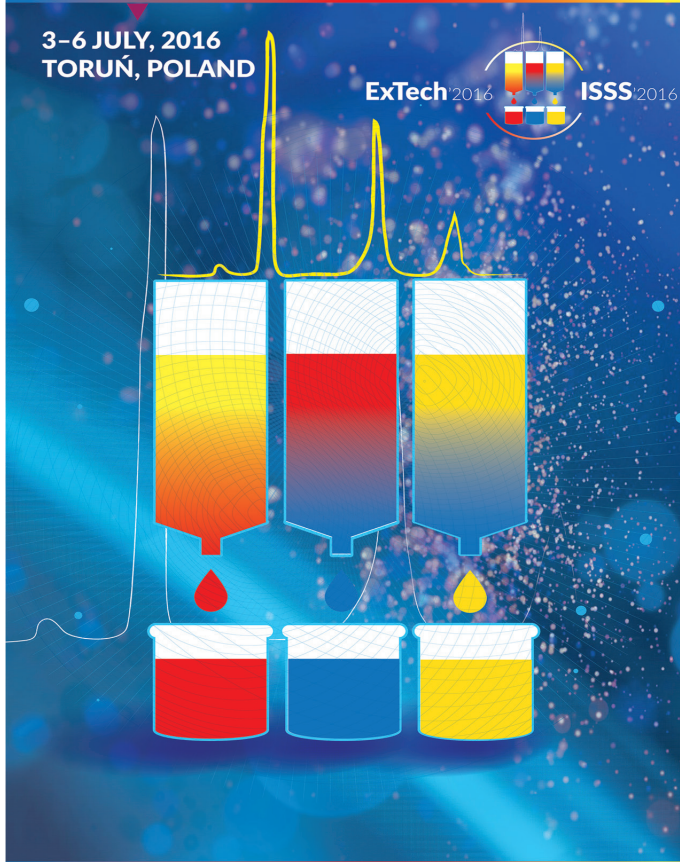
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**OP-20****Accurate quantification of time-weighted average concentrations of BTEX by SPME and GC-MS****O. Demyanenko, N. Baimatova, B. Kenessov, M. Bektassov, J.A. Koziel***Al-Farabi Kazakh National University, Almaty, Kazakhstan  
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Solid-phase microextraction (SPME) is a promising method for determination of time-weighted average (TWA) concentrations of volatile organic contaminants (VOCs) in ambient air [1]”ISSN” : “00032700”, “PMID” : “10221072”, “abstract” : “The solid-phase microextraction (SPME. However, it is often associated with insufficient accuracies caused by (1) adsorption of analytes by metal surfaces of SPME fiber assembly [2], (2) change of calibration slope factors with time caused by the fiber wear out and (3) ambient temperature fluctuations during sampling. The aim of this research was to improve the accuracy of the method for determination of TWA concentrations of benzene, toluene, ethylbenzene and *o*-xylene (BTEX) by SPME in combination with GC-MS. It has been proven that the effect of the mass adsorbed by metals parts may be decreased by optimization of BTEX desorption parameters from SPME fiber – fiber insertion depth and desorption time. For Agilent 6890N GC split/splitless inlet, optimal 85  $\mu\text{m}$  Carboxen/polydimethylsiloxane fiber insertion depth was 16 mm at the maximum possible fiber exposure depth and desorption during 20 s. Change of calibration slope factors may be controlled by an internal standard (IS) method. In this, research, benzene-d6 was used as IS. At 8 h sampling time, better linearity was observed using IS method. RSDs of calibration slopes were below 20% for all analytes. To supply IS to the extraction area, a prototype of TWA SPME sampler was developed. It was proposed to supply IS by its diffusion from a gas phase above its solution to the known flow rate of a sampled air directed to the extraction zone where three replicate fibers are located. To minimize the effect of sampled air temperature fluctuations, the sampler was equipped with a temperature controller and a heater.

**Acknowledgement:** The work was supported by the grant from the Ministry of Education and Science of the Republic of Kazakhstan 4185/GF4 “Development of semi-automatic station for monitoring concentrations of volatile organic contaminants in ambient air of cities using chromatographic methods”.

**References:** [1] P.A. Martos, J. Pawliszyn, Time-weighted average sampling with solid-phase microextraction device: Implications for enhanced personal exposure monitoring to airborne pollutants, *Anal. Chem.* 71 (1999) 1513–1520. [2] N. Baimatova, J. Koziel, B. Kenessov, Quantification of benzene, toluene, ethylbenzene and *o*-xylene in internal combustion engine exhaust with time-weighted average solid phase microextraction and gas chromatography mass spectrometry, *Anal. Chim. Acta.* 873 (2015) 38–50.