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MICROEXTRACTION AND CHROMATOGRAPHIC TECHNIQUES IN WATER QUALITY CONTROL

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ABSTRACT

One of the most important parts of analytical process is sample preparation. For this purpose isolation and preconcentration methods of various analytes are utilised. Liquid – liquid extraction (LLE) is one of the oldest and most frequently used pretreatment procedure. The benefits of this method are simplicity and low a cost. The solvent selection is one of the most important parameter in the extraction procedures. However, conventional LLE requires large volumes of high purity solvents, which are often expensive or hazardous. The desire to reduce the time and organic solvents volume required for the traditional extractions has led to the development a number of solutions, such as solid phase extraction (SPE) or solid phase microextraction (SPME). Solid phase microextraction as a universal tool for isolation and preoconcentration pollutants from different matrices was introduced and developed by Pawliszyn and co-workers. This technique is frequently used for determination of various organic micropollutants in water, which allows extraction without any solvents. However the traditional LLE technique in different variants is still improved. Recently, the single drop microextraction (SDE) has been evaluated as an alternative to SPME. In this technique drop of solvent is suspended from the tip of chromatographic syringe and is immersed in a liquid sample. Advantages of this method that are less time consuming, easy to use, reduces exposure to hazardous solvents and offers increased specify.

This study presents results of investigation on persistent organic pollutants (POPs) presence in environment. Different sample preparation methods such as: SPE, SPME and SDE was used for extraction of selected pesticides, PCB, halocarbons and phenols. These pollutants are chemically very stable and they are still present in the environment as well as they accumulate along the food chain. Determinations of POPs in river water could be interesting for monitoring of water quality in different areas of urban, industrial and agricultural areas.