



Removal of selected micropollutants from water by ultrasonication

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ABSTRACT

As a result of the urbanization process, an increase in population, and the development of analytical techniques, recently, many organic micropollutants are discharging and identified in aquatic systems. Moreover, many of them can be harmful to human health even at low concentrations. However, literature reports proved that traditional water treatment methods may be ineffective in the removal of organic micropollutants, thus they can migrate through the environmental matrices in an unchanged form for a long time. Consequently, innovative and effective techniques for water treatment should be developed to prevent the discharge of undesirable substances into the water and one of them is ultrasonication. This study aimed to determine the ultrasonication efficiency in the removal of selected organic micropollutants from water, namely bisphenol A, carbamazepine, 17- α ethinyloestradiol, pyrene, and triclosan. Research proved that sonication time, the addition of glass and sand particles and ozone addition had a significant impact on micropollutants degradation efficiency. Furthermore, in the research impact of water matrices in which micropollutants occur on degradation rate by ultrasonication was examined. To evaluate the process effectiveness, the gas chromatography method (GC-MS) preceded by solid phase extraction (SPE) was used. Moreover, Microtox[®] bioassay was implemented to evaluate the toxicity of the post-treated sample.

Keywords: Ultrasonication; AOPs; Water treatment; Micropollutants; Ecotoxicity; Ultrasound

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