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Development of dispersive liquid-liquid microextraction (DLLME) for the determination of some estrogens in water

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In this study, we propose a simple, fast, low cost extraction method based on dispersive-liquid-liquid microextraction (DLLME) and GC-MS analysis for the determination of 17β-estradiol (E2) and diethylstilbestrol (DES) in water. The main parameters affecting DLLME process such as the kind of extraction solvent, dispersive solvent, volume of the extraction and the dispersive solvent, extraction time and ionic strength were optimized. This method involves the rapid injection of an appropriate mixture of extraction solvent (100 µL chloroform) and dispersive solvent (1.00 mL acetonitrile) to water samples. After centrifugation of formed cloudy solution, sedimented phase was evaporated. Prior to GC-MS analysis samples were derivatized. The correlation coefficient of the calibration curve was higher than 0.994. The linear range was from 1 to 20 ng mL\(^{-1}\) for diethylstilbestrol (DES) and 1 to 10 ng mL\(^{-1}\) for 17β-estradiol (E2). The detection limits of DES and E2 were 0.42 ng mL\(^{-1}\) and 0.71 ng mL\(^{-1}\), respectively. The recoveries of the method for DES and E2 from well water samples at spiking levels of 5 ng mL\(^{-1}\) were 101.6% and 93.4%, respectively.

Biography

P Caglar has received her BS and MS (combined degree) in Chemical Engineering in 1973 from Chemical Engineering Department of Hacettepe University in Ankara, Turkey. She received her PhD in Analytical Chemistry from Chemistry Department of Hacettepe University in 1980. She is currently a Professor of Analytical Chemistry. She was awarded by “TUBITAK and British Council Fellowship” at University of Manchester DIAS for 4 months in 1987, “Fulbright Fellowship” at Rensselear Polytechnic Institute, Department of Chemistry in Troy, NY for a year in 1990, and “Visiting Professorship” at University of Virginia, Department of Chemistry in Charlottesville, VA for a year in 2001-2002. Her current research interests are design, development and application of fiber-optic chemical sensors and biosensors, novel sensors based on capillary electrophoretic microchip systems using fiber optics. She has over 70 papers published in refereed journals.

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