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Liquid phase micro-extraction *in-situ* derivatization for determination of estrogens in water by gas chromatography-tandem mass spectrometry

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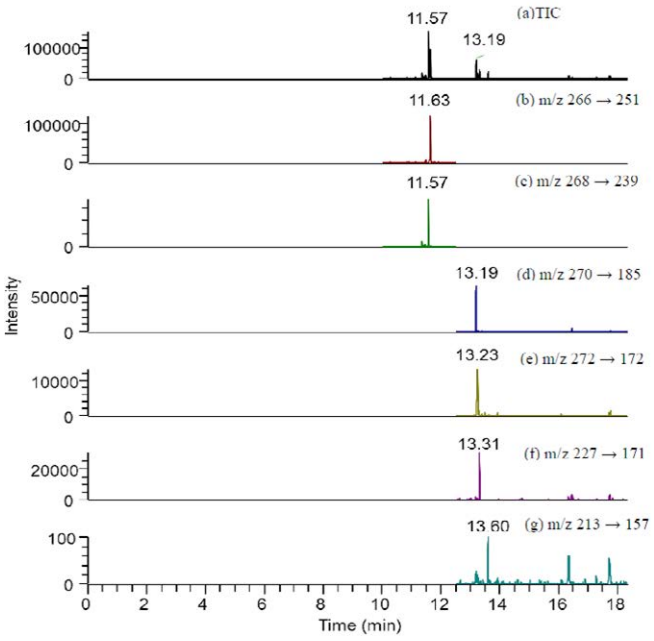
Endocrine disrupting chemicals (EDCs) in environmental aqueous system have gained global attention because they may interfere with central regulatory functions by antagonizing or mimicking the effects of endogenous hormones, even at extremely low concentrations. In human life, the use of estrogens, the group of steroidal hormones of EDCs, in animal feeds, contraceptives, and hormone replacement therapy drugs is increasing dramatically. Estrogens enter the human living environment may cause many diseases such as breast and prostate cancers. Hence, to develop efficient analytical method for determination of estrogens in aquatic samples is important. This study develops liquid phase micro-extraction (LPME) *in situ* derivatization combined with gas chromatography-tandem mass spectrometry (GC-MS/MS) for analyzing of trace estrogens in aquatic samples. The targeted estrogens include mestranol (MES), dienstrol (DIE), diethylstilbestrol (DES), estrone (E1), 17α-estradiol (17α-E2), and 17α-ethinylestradiol (17α-EE). 11.25 mL pH adjusted (pH 6) water sample containing 5% sodium chloride was mixed with 3.75 mL dansyl chloride derivatization agent. After derivatization, the derivatives were extracted by LPME with octanol as extraction solvent and the extractant was detected by GC-MSMS. The linearity of the proposed method ranged between 0.05 to 50 ng/mL. The detection limits (LODs) of targeted estrogens were between 0.3 to 1.1 ng/mL. The feasibility of applying the proposed method to analyze the six estrogens in aqueous samples was also examined. The results showed the method proposed is suitable for determination of trace estrogens in environmental water samples.



Biography

Maw-Rong Lee has his expertise in developing new analytical techniques using modern instrumentation and sample preparation methods, and the applications of these techniques in areas such as environmental, clinical, and forensic chemistry. His special research interests include Mass Spectrometry, Tandem Mass Spectrometry and Integrated Separation/Identification Techniques. He is also interested in using tandem mass spectrometry to study ion molecule reaction, proton affinity in gas phase. The sample preparation methods used are LPME, SPME, SPE, microwave and SFE.

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