

# Chromatography

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## Temperature controlled liquid phase microextraction, *in-situ* derivatization for determination of estrogens in water by gas chromatography-tandem mass spectrometry

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Estrogens, one group of endocrine disrupting chemicals (EDCs), can easily accumulate in the human body and interfere with organism's endocrine system at low concentration. The trace estrogens in environmental water system have attracted scientists' and human attention. Therefore, to develop a simple, rapid, and high sensitive analytical method for determination of the trace estrogens in environmental water is important for environmental safety. In this study, a novel temperature-controlled liquid phase microextraction (TC-LPME) by *in-situ* derivatization coupled to gas chromatography-tandem mass spectrometry (GC-MS/MS) for analyzing trace estrogens including estrone, 17 $\alpha$ -estradiol, 17 $\alpha$ -ethinylestradiol, mestranol, diethylstilbestrol, and steinheim in water matrix has been developed. An aliquot of 11.25 mL water sample with pH 7 and containing 5% sodium chloride reacted with 3.75 mL dansyl chloride (10  $\mu$ g/mL) as derivatization agent has been prepared. After derivatization for 15 minutes at 60°C, the derivatives were extracted by liquid phase microextraction with octanol as extraction solvent and the extractant was analyzed by GC-MS/MS. The linearity of the proposed method was 0.05 to 50 ng/mL; with a coefficient of determination above 0.9940. The limits of detection (LODs) of target estrogens were between 0.3 and 1.1 ng/mL. The intra-day and inter-day precisions were between 1.2 and 10.8% and 2.9 and 17.6%, respectively. The recovery of the proposed method ranged 84.9 and 107.8%. The results demonstrated that the proposed TC-LPME-GC-MS/MS method is rapid, simple, high sensitive and high selective method for the determination of trace estrogens in environmental water matrix.

### Biography

Maw-Rong Lee has completed his MS from University of Florida. He is Dean of College of Science and Distinguished Professor of Department of Chemistry at the National Chung Hsing University, Taiwan. He has published more than 80 papers in reputed journals.

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