

4th World Congress on

MASS SPECTROMETRY

June 19-21, 2017 London, UK

Application of ion-pairing injection-port derivatization GC-MS to detect phenolic endocrine disruptors in human urine

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Due to the superior separation, high distinguishing power and availability in most routine laboratories, GC-MS system is a frequently used technique for detecting organic micro pollutants in environmental, biota and food samples. To improve the GC chromatographic separation for hydroxylated (polar) analytes, derivatization is typically used to increase the volatility and to improve sensitivity. However, off-line derivatization is laborious and time-consuming. Injection port derivatization (IPD), also known as on-line derivatization, means that the derivatization reaction occurs in the hot GC injection port. IPD simplifies the sample preparation procedure, avoids the usage of extra experimental apparatus, reduces the amount of derivatization reagents and organic solvents, shortens the derivatization time, and increases derivatization efficiency and ensures more accurate quantitation. This study demonstrated the feasibility of applying solid-phase extraction (SPE) coupled with ion-pairing injection-port derivatization (IP-IPD) GC-MS to detect phenolic endocrine disruptors in human urine samples. Three commonly and most concern phenolic endocrine disruptors: bisphenol A, 4-nonylphenols and 4-t-octylphenol, were employed in the method development and validation of this study. The parameters affecting SPE and IP-IPD were systematically investigated. Accuracy and precision were evaluated, and the suitability of the method or the determination of the trace levels of the target analytes in human urine samples was demonstrated.

Biography

Wang-Hsien Ding completed his PhD in Analytical Chemistry in 1989 at State University of New York at Albany, USA. He is currently the Professor of National Central University, Taiwan. His research interests include "Development of methods for emerging contaminants detection in environmental, biota and food samples by various micro-extraction techniques coupled with GC-MS or LC-MS detection". He has published more than 80 papers in reputed journals.

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