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The evaluation of stir-bar sorptive extraction and dispersive liquid-liquid microextraction methods for the determination of 20 pharmaceuticals in environmental waste water**Yuan-Po Lee, Yi-Jia Gu, Ching-Fen Yeh and Wei-Chao Lin**
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Stir bar sorptive extraction, SBSE and Dispersive liquid-liquid microextraction, DLLME have attracted much interest due to their simplicity, rapidity of operation by allowing the direct extraction of solutes from sample or low consumption of solvents and reagents during sample pretreatment. In this research, SBSE and DLLME were used for the sample pretreatment of environmental water samples and followed by gas chromatography/mass spectroscopy analysis for the validation of determining 20 pharmaceuticals in environmental water samples. Fluoxetine, chlorpheniramine, sertraline, methamphetamine, diphenhydramine, amitriptyline, lidocaine, venlafaxine, citalopram, chlorpromazine, verapamil, propoxyphene, promethazine, diazepam, meperidine, methadone, doxylamine, mirtazapine, dextomethorphan and codeine were selected as the target compounds. The results show that most substances can be effectively extracted by SBSE at pH 9.2 except methamphetamine, lidocaine and codeine and by DLLME using toluene as extraction solvent except methamphetamine, propoxyphene, codeine and diazepam. The applicability of the sample pretreatment methods strongly depended on the characteristics of target compounds. Codeine shows very poor recoveries which means it is not suitable to determine its content under selected analytical conditions. It is recommended to use SBSE methods for sample pretreatment because it can achieve lower detection limit, repeated use of stir bar and no need to use extraction solvent. For real environmental water samples, SBSE was used to determine the presence of target compounds and evaluate the matrix effect of the real samples. The results show that only lidocaine was detected in one of the hospital waste samples and methamphetamine, lidocaine and codeine all showed poor recoveries as in standard solution.

Biography

The Authors are all teaching in Chia-Nan University of Pharmacy and Science and worked on the analytical methods development and validation for more than 20 years. The scope for the analytical methods have applied to pharmaceutical, cosmetic and environmental samples and offer industrial services.

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