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# Microwave-assisted extraction of emerging pollutants in environmental and biological samples before chromatographic determination

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## HIGHLIGHTS

- Principles and description of microwave-assisted extraction (MAE)-based techniques
- MAE is green method with low solvent consumption and high sample throughput
- Overview of MAE applications for emerging organic pollutants in the environment
- MAE of pharmaceuticals and personal-care products
- MAE of surfactants, plasticizers, flame retardants

## ABSTRACT

Two of the main topics of growing concern in analytical chemistry are the development of green analytical methods and the determination of emerging pollutants. One of the well-established green extraction techniques is microwave-assisted extraction (MAE). After giving a brief description of MAE principles, the present review comprehensively describes the applications of MAE in the past six years for the determination of the main families of emerging organic pollutants in the environment. Compared to other extraction techniques, MAE offers many advantages, such as great reductions in extraction time and solvent consumption, as well as the possibility of performing multiple extractions, thereby increasing sample throughput. From a technological point of view, most future application areas are likely to focus on improving the flexibility of recently introduced sequential systems with the capacity to control conditions in each extraction vessel.

### *Keywords:*

Chromatography-mass spectrometry  
Emerging organic pollutant  
Environmental analysis  
Flame retardant  
Microwave-assisted extraction  
Personal-care product  
Pharmaceutical  
Plasticizer  
Sample preparation  
Surfactant

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