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Recent trends in using single-drop microextraction and related techniques in green analytical methods

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HIGHLIGHTS

- Applications of single-drop microextraction (SDME)
- SDME and related techniques used in green analytical methods
- SDME benefits are simplicity, low cost, efficiency, microliter solvent requirements
- Ionic liquids, automation, and continuous-flow microextraction are subjects covered

ABSTRACT

Single-drop microextraction (SDME) was the first successful application of the solvent-microextraction (SME) technique for concentration and purification of analytes from aqueous and gaseous samples. However, SDME has inherent extraction-solvent-volume and drop-stability limitations, leading to the development of other SME techniques. SDME and related exposed solvent techniques remain popular due to their low cost, simplicity and the need for only common laboratory equipment. Many of these techniques also lend themselves to complete automation and on-line continuous-flow analysis. Since SDME and its related techniques involve the use of microliter quantities of extraction solvent, they are important green analytical methods. Recent uses of SDME and related techniques in green analytical methods are: direct immersion SDME (DI-SDME), headspace SDME (HS-SDME), drop-to-drop microextraction, (DDME), directly-suspended droplet microextraction (DSDME), liquid-liquid-liquid microextraction (LLLME), continuous-flow microextraction (CFME), and solvent-supported microextraction (SSME).

Keywords:

Continuous-flow microextraction (CFME)
Direct-immersion single-drop microextraction (DI-SDME)
Directly-suspended droplet microextraction (DSDME)
Drop-to-drop microextraction (DDME)
Headspace single-drop microextraction (HS-SDME)
Liquid-liquid-liquid microextraction (LLLME)
Microfluidic device
Single-drop microextraction (SDME)
Solvent microextraction (SME)
Solvent-supported microextraction (SSME)

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1. Introduction

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