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Recent advances in sample preparation methods**Yingying Wen**

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Sample preparation is a crucial bottleneck in the whole analytical process. Moreover, samples such as environmental and biological samples are complex in which the concentration of the target analytes is very low. Sample preparation methods have aroused increasing interest in research on analytical the bioanalytical techniques field, as they have the key roles in obtaining high clean-up and enrichment efficiency in the analysis of trace targets presented in the complex matrices. Recently, except the traditional sample preparation methods (i.e. SPE and LLE), more and more new sample preparation methods are applied prior to chromatography, spectrometry and electrochemistry analysis, for example, Dispersive Liquid-Liquid Micro Extraction (DLLME), Salting-out Assisted Liquid-Liquid Extraction (SALLE), cloud point extraction (CPE), etc. In DLLME, an appropriate mixture of extraction and disperser solvents is rapidly injected into an aqueous sample by a syringe. The fine particle of extracting solvent that is dispersed into aqueous phase forms a cloudy solution and allows its interaction with the analytes. The analytes are extracted from the sample to the fine droplets of extraction solvents. After centrifugation, phase separation is achieved and the enriched analytes is analyzed by some instrumental methods. SALLE is based on the formation of a biphasic system of mutual miscibility of two liquids by addition of additives, i.e. salts and sucrose. Considering the organic solvents as extraction and protein precipitation agents, SALLE is an excellent alternative used for biological sample. CPE is based primarily on the hydrophobic interaction between solutes and surfactants. It has become an alternative to conventional solvent extraction due to several possible advantages such as low cost, environmental safety, high capacity to concentrate a wide variety of analytes of widely varying nature with high recoveries and high enrichment folds.

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