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Application of ultra performance convergence chromatography in food safety

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The development of greener analytical techniques is a topic of great interest. There is an increasing need for new analytical methods that can handle a large number of analytes in food and biological samples. Ultra performance convergence chromatography (UPC²) is considered a valuable tool helping to separate and determine compounds differing by subtle structural differences. UPC² presents several advantages over high performance liquid chromatography (HPLC); it takes less column equilibration time and consumes less organic reagents. UPC² has recently been successfully used to separate and determine a lot of analytes, including many pharmaceutical compounds. In this work, recent applications of UPC² for the analysis of different compounds in food and biological samples were reviewed, in the hope of helping chromatography users to have a new look on the possibilities offered by this technique. Furthermore, a simple, highly sensitive and fast analytical method based on UPC² with photo-diode array detection (PDA) has been developed to quantify 15 sulfonamides and their N₄-acetylation metabolites in serum. Variables affecting the UPC² were optimized to get a better separation. We provide a discussion of stationary phase, modifiers and additives, column temperature, flow rate, and automatic back pressure regulator (ABPR) backpressure for UPC² analysis and detection sensitivity. The performance of the developed method was also evaluated.

Biography

Guo Wei has completed her PhD from China Agricultural University (CAU). She is the Vice Director of Institute of Food Safety in Chinese Academy of Inspection and Quarantine. Her fields of research are application of chromatography/mass spectrum in food safety, medicinal analysis, proteomics, metabonomics, etc. She has finished over 20 research projects successfully, published more than 15 research papers in international top-tier academic journals, and two books written in Chinese and English.

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