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Nanomaterials for online sample preparation with tandem mass spectrometry for determination of drugs in biological fluids

Mohamed Abdel-Rehim
Stockholm University, Sweden

Due to the complexity of biological samples, the sample preparation has an important role in bioanalysis. The sample preparation aim is to increase the selectivity and improve the effectiveness of analytical instrumentation. Sample preparation is typically the most difficult part of bioanalysis. The goal of sample preparation is to extract and transfer the analytes of interest from a complex matrix to a simpler medium for final analysis. Future directions in sample preparation are miniaturization, automation and integration into analytical instruments. In recent years, the use of nanomaterials in sample preparation gained attention of many research groups. Compared to micro particles nanomaterials have many advantages such as selective extraction with higher sorption capacities for enrichment and separation of the analytes of interest from biological samples. Today mass spectrometry (MS) is the most used (if not only) detector in drug bioanalysis where good selectivity and high sensitivity are often required. The enhancement of the LC/MS technique during the past few years has led to decreased analysis times and increased throughput in the bioanalytical field. Due to its selectivity the use of MS has been strongly increased for applications for biological samples. The advent of modern, user-friendly mass spectrometers has led to a reconsideration of the application of mass spectrometry in the analytical process. In the present paper, nanomaterials as sorbents for microextraction techniques for online analysis of biological samples will be presented and discussed.

mohamed.abdel-rehim@aces.su.se