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Strategies for automating solid-phase extraction and liquid-liquid extraction in radiochemical analysis

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Highlights

- Trends in automation of liquid-liquid extraction (LLE) in radiochemical analysis
- Trends in automation of Solid Phase Extraction (SPE) in radiochemical analysis
- Pros and cons of automation of radiochemical analysis by flow analysis techniques
- Strategies for automating SPE and LLE in radiochemical analysis

Abstract

Radionuclides monitoring is an issue of increasing concern due to their widespread use last years. Thus, efficient methods for radionuclides determination are required. Radionuclides extraction and preconcentration is usually required prior detection, especially when dealing with environmental and biological samples. Most commonly pretreatment techniques in radiochemical analysis are solid-phase extraction and liquid-liquid extraction, providing not only sample clean-up but also high enrichment factors. These protocols are usually long and tedious involving a large consume of reagents and of waste generation what difficult their application in monitoring plans. Flow analysis techniques have proved to be suitable platforms to develop automated radiochemical analyzers, offering advantages such as fast and low-cost methods with low reagents consumption and so waste generation and low manipulation by the analyst. Thus, in this review strategies followed to automate radiochemical analysis exploiting most commonly used pretreatment procedures by flow techniques are presented and critically compared.