

Faster, Cheaper, and Pollution-Preventing Analytical Methods for Environmental Radionuclides

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Methods for chemical characterization of the environment are being developed under a multi-task project for DOE's Office of Environmental Management. The project focuses on improvement of radioanalytical methods with an emphasis on faster and cheaper routine methods.

We have developed improved methods for separation of environmental levels of technetium-99, radium, strontium, and actinides from soil and water, and separation of actinides from soil and water matrix interferences. Among the novel separation techniques being used are element- and class-specific resins and membranes. We have also developed methods for simultaneous detection of multiple isotopes using inductively coupled plasma/mass spectrometry (ICP/MS). These ICP/MS methods can replace many radiometric techniques because of their greater sensitivity and efficiency. Judicious selection of operating conditions and sample introduction systems can further improve the figures of merit, cut costs, and minimize waste.

Integration and automation of the separation methods with the ICP/MS methodology using flow injection analysis achieves more reproducible results, reduce labor cost, cut analysis time, and minimize secondary waste generation through miniaturization of the process.

Research results will be presented.

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