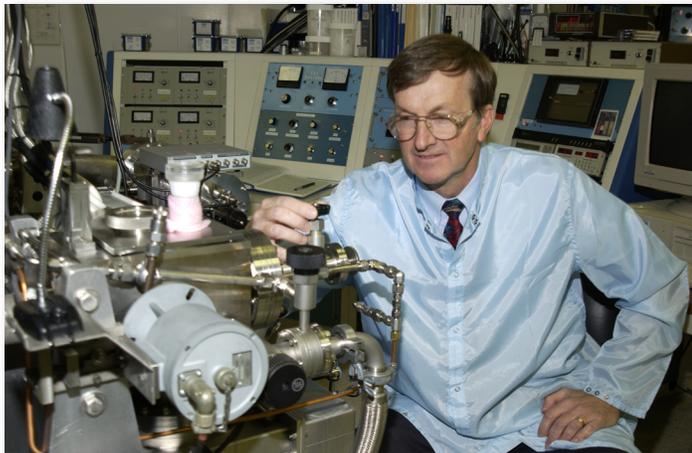


Analytical Chemistry



Dr. Justin Halverson conducts research on the development and application of mass spectrometry and nuclear spectrometry instrumentation to support nonproliferation activities.

Overview

SRNL provides a full range of state-of-the-science analytical chemistry capabilities to support laboratory research programs and our customers.

Analysis services include those traditionally associated with the chemical process industry, and also those needed to meet the challenges of environmental restoration activities, nuclear materials processing, and radioactive waste characterization/disposition.

The strength of the organization is not only in providing analytical services, but in developing new and enhanced methods. Fifty years of support for nuclear operations at the Savannah River Site have led to extensive analytical expertise in the following areas:

High Sensitivity Measurements

The Savannah River National Laboratory's development of new techniques for measuring ultra-low amounts of radioactivity began soon after the first water sample was collected from the Savannah River as part of the Savannah River Site's 1951 pre-operation environmental survey, the first ever conducted prior to the construction and operation of a U.S. nuclear facility.

With the development of increasingly sophisticated methods and technologies, the laboratory's achievements in ultra-trace radiation detection and measurement have been recognized locally, nationally and internationally. These methods have been employed to assure that the environmental impacts of nuclear operations are kept extremely low, to assist in emergency preparedness and response, and to serve national and international needs in the areas of nuclear nonproliferation, international safeguards, national security and law enforcement.



SRNL's TRAC Vehicle for measuring trace radioactive materials in the environment

SRNL takes pride in the fact that its technologies help provide for a cleaner, safer, more secure world. The Laboratory uses its highly specialized expertise and equipment to make key contributions to our national priorities, including:

- Nuclear inspections in many countries to support international safeguards and nonproliferation efforts
- High sensitivity measurements to locate the source and measure the impact of radioactive releases on the environment and the surrounding population

FASTfacts

- SRNL underground counting facility has detection sensitivity equal to less than one part per trillion

Analytical Chemistry



Dr. Art Jurgensen conducts research on the development and application of Thermogravimetry, X-Ray Diffraction, and X-Ray Fluorescence techniques to support hazardous and radioactive waste disposition, actinide oxide stabilization, and other materials characterization studies.

- Techniques for sampling of water and air for trace radionuclides
- The Tracking Atmospheric Radioactive Contaminants (TRAC) vehicle, a fully-equipped mobile laboratory, to measure trace radioactive materials released to the atmosphere
- An underground ultra-low background radioactivity measurement facility, the only one in the U.S.

Analytical Measurements on Nuclear Materials

SRNL analytical chemistry capabilities have been deployed in harsh environments common in nuclear operations for over 50 years. SRNL has developed a broad expertise in characterization of nuclear materials and by-products for a comprehensive set of constituents. Expertise includes:

- Nuclear chemistry separations methods
- Elemental analyses by spectroscopy
- Trace organic compounds
- Radioactive waste glass analysis, including custom dissolution techniques
- Scanning electron microscopy capabilities utilizing a glovebox-contained unit for highly radioactive materials
- X-ray diffraction and x-ray fluorescence capabilities for analyses of radioactive materials
- Radiation shielding calculations and modeling
- Field survey capability and development of automated methods for equipment contamination measurements and nuclear material holdup measurements

Contact

Steve Wach

803-725-3020

steve.wach@srnl.doe.gov

Savannah River National Laboratory,
Bldg. 773-41A
Aiken, SC 29808

srnl.doe.gov

JANUARY 2009



Spectroscopic technology for process monitoring is the area of basic and applied research being pursued by Dr. Laura Tovo (left) and Dr. Kristine Zeigler. On-line fiber-optic Raman spectroscopy and miniature mass spectrometry are among the various spectroscopic methods that Dr. Tovo and Dr. Zeigler are demonstrating in the process environment.

We Put Science To Work™

SRNL is managed and operated for the U.S. Department of Energy by Savannah River Nuclear Solutions, LLC