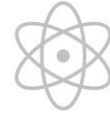




A 5-Day Short Course

Radiochemistry Fundamentals
May 6-10, 2024 ♦ Online Live Instruction



Course Description

This 5-day course is designed for engineering and science employees who need a basic understanding of fundamental nuclear and radiochemistry processes, and their applications in radioactive waste management, the nuclear fuel cycle, nuclear medicine, chemical engineering, and analytical chemistry.

A Course Developed For Varied Backgrounds

- ◆ Gain a solid background in the fundamentals and theory of nuclear and radiochemistry.
- ◆ Learn the basics of counting statistics for radiochemistry
- ◆ Understand the basics of instrumentation for radiochemistry counting: gamma-ray spectroscopy, alpha spectroscopy, liquid scintillation, etc.
- ◆ Understand the principles of radiochemistry in the recycling of spent nuclear fuel

Course Instructor



Sheldon Landsberger, PhD, is a Professor of Nuclear and Radiation Engineering at The University of Texas at Austin. He is nationally and internationally known for his work in low level gamma-ray counting and the application of neutron activation analysis in environmental research. He has more than 180 peer-reviewed journal publications. For the past 30 years he has been extensively involved in nuclear instrumentation, health physics and radioactive waste management both in teaching and research. He has been a consultant for the International Atomic Energy Agency since 1988 and has travelled to more than 30 countries as an expert instructor in nuclear science and engineering.

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Course Outline

- Atomic structure
 - Atomic electron orbital arrangements
 - Organization of the periodic table
 - Groups and trends on the periodic table
- Nuclear structure and stability
 - Decay modes and types of radiation
 - The chart of the nuclides
- Radioactive transformation
 - Equilibria
 - Secular equilibrium
 - Transient equilibrium
 - No equilibrium
- Decay Modes
 - Alpha decay
 - Beta decay
 - Gamma transitions
 - Branching decay
 - Spontaneous fissions
 - Rare decay modes
- Measurement of nuclear radiation
 - Gas-filled detectors
 - Scintillation detectors
 - Semiconductors
 - Alpha spectrometry
 - Beta spectrometry
 - Gamma ray spectrometry
 - Gamma ray low-level counting
 - Statistics and errors in counting
- Nuclear reactions
 - Transmutation and the production of synthetic radioelements
 - Cross-sections of nuclear reactions
 - Nuclear fission
 - Activation analysis
- Nuclear fuel cycle
 - Nuclear reactor radiochemistry
 - Reprocessing of nuclear fuels
 - Radioactive waste management
- Dating by nuclear methods
 - Cosmogenic Radionuclides
 - Natural decay series
 - Ratio of stable isotopes
 - Radioactive disequilibria
- General chemistry applied to radiochemistry
 - Actinide chemistry
 - Mass balances
 - Chemical equations and stoichiometry
 - Equilibrium reactions
 - Acid/base reactions
 - Oxidation/reduction reactions
 - Aqueous solubility
 - Phase partitioning

HOW TO REGISTER ...

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