



A 5-Day Short Course

Radiochemistry Fundamentals

June 10-14, 2019 ♦ Boston, MA



Course Description

This 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.

ONSITE TRAINING

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For further information please call 860-738-2440.

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 disequilibrium
- 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



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Continuing Education Credits

The AAHP awarded 40 credits for this course.

Accommodations



This course will be held at Boston Newton Marriott.

A block of rooms has been reserved at reduced rates for course participants. Please make your reservation directly with the hotel by calling 617-969-1000.. Please specify that you are attending Technical Management Services' short course to receive the group rate.

The reserved block of rooms will be released 3 weeks prior to the course (at which time rooms will be offered on an availability basis)

4 Easy Ways To Register....

1. Register online: www.tmscourses.com
2. Call TMS at (860) 738-2440
3. Fax your registration (860) 738-9322
4. Mail the attached form:
TMS, P.O. Box 226, New Hartford, CT 06057

Name _____
Company _____
Address _____
City _____ State _____ Zip _____
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Course Fee: \$1295.00

- Bill my company
P.O. Number: _____
Charge Credit Card:
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Discounts:

\$50 discount if 2 or more people from the same company register
... take an additional \$50 discount if payment is received by July 27th