TMS
The Training Leader For Nuclear Industry Professionals
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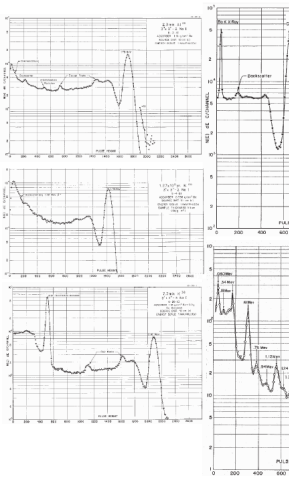
Gamma Ray Spectroscopy

Recent Advances in Research, Development and Applications

May 13-17, 2024 ◆ Live "Online" instruction ◆ Course Fee: $1395



This 5-day course will provide an overview of modern gamma-ray instrumentation while describing the fundamentals of radiation interactions. The training encompasses the basics of radioactivity, decay schemes, uncertainty measurements, analog and digital electronics, scintillation and semiconductor detectors, quality assurance and quality control. The training will also include on-line laboratory demonstrations and exercises.

A COURSE DEVELOPED FOR VARIED BACKGROUNDS

- Gain a solid background in the interactions of radiation with matter.
- Learn the basics of radioactive decay and decay schemes.
- Understand the basics of measurement and detection for gamma ray instrumentation.
- Explain spectral features and their interpretation, including peak identifi cation.
- Understand quality assurance and quality control.

Course Topics

- Historical Overview
- Nucleus, Isotopes and Decay Schemes
- Gamma-Ray Interactions
- Germanium Detectors
- Detector Effi ciency, Calibration and Effi ciency Curves
- Dead Time and Pile-Up Corrections
- Live Time Corrections and Loss Free Counting
- Shielding
- Gamma-Ray Attenuation
- Uncertainty of Measurement
- Radiation Protection
- Low Level Counting/ Coincidence and Anti-Coincidence Methods
- Room Temperature Detectors
- Digital Systems
- Quality Assurance and Quality Control
- In-Situ Gamma Ray Detection
- How to Choose a Gamma Ray Detector
- On-Line Laboratories and Exercises: Statistics, Energy Resolution, Gamma-Ray Attenuation, Shielding

About the Instructor

Sheldon Landsberger, Phd., is a Professor in the Nuclear and Radiation Engineering Program at The University of Texas at Austin in the Walker Department of Mechanical Engineering. He is nationally and internationally known for his work in low level gamma-ray counting and the application of radiochemistry analysis in environmental research. He has more than 250 peer-reviewed journal publications with many in radioactivity measurements. For the past 40 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 (IAEA) since 1988 and has travelled to more than 40 countries as an expert instructor in nuclear science and engineering. He has also developed training workshops in Radiochemistry at Nuclear Power Plants and Radiation Safety Offi cer training in the Oil and Gas Sector.

HOW TO REGISTER ...

Visit our website at www.tmscourses.com and register online, or call 860-738-2440
Registration questions can be emailed to info@tmscourses.com

Course Fee: $1395 Discounts: $50 for two or more from same company

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Topics

Review of Fundamentals
- Spectral Characteristics
- Transient and Secular Equilibrium
- Decay Corrections
  - a. Short Lived Nuclides Decay During Counting
  - b. Buildup
  - c .Neutron Activation
- Peak Shape and Fitting What it is and What it Means.
- Decay Schemes/ Gamma Abundance
  -References

Review of Electronics and Effects on Spectral Results
- Pole zero
- ADC
- Dead Time
- High and Low Count Rate Considerations

Calibration
- Energy and Shape Calibrations
- Fixed Geometry Efficiency Calibration Considerations
- Modeled Laboratory Geometry Considerations
- In Situ Field Geometry Considerations

Counting Statistics
- Counting Error
- MDA/ Critical Level Calculations
- Total Propagated Uncertainty

How Does the Software Identify A Nuclide
- Peak Search and Fit
- Interactive Peak Fit
- Interference Corrections
- MDA/LLD/ Critical Level
- Analysis Parameters which affect Results

Summation Error Corrections
- Random Summing
- Coincidence (Cascade) Summing Correction

Library Parameters
- Selecting Key Lines
- Selecting Confirming Peaks
- Use of Lines from Progeny for Quantification of a Nuclide
- Optimizing the Library to the Software

Reviewing Spectra
- Exercises

Unidentified Peaks
- Why Resolve These Peaks?
- How to Resolve These Peaks.

Quality Assurance
- Establishing Parameters
- Trending Charts
- Control Charts
- Verification of Efficiency Calibrations
- ANSI N42.23

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CANCELLATION POLICY:

Cancellations are accepted up to three weeks prior to the start of the course. After this time a $100 cancellation fee will be charged. Registrants who cancel within 1 week of the course will be liable for the full course fee. Occasionally, enrollment for a course is low and it becomes necessary for us to cancel the course. We apologize for any inconvenience a cancellation may cause and will make every effort to reschedule the course or make other arrangements for you.

In the event TMS may cancel a course due to low enrollment, notice will be given 2 weeks prior to the class.