

Contact Information
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Laboratory Analysis and Forensics

2 days 3 instructors

Overall Objective:

This course is for those involved with the handling and analysis of explosives in the laboratory. It is aimed at those who may have experience in chemical analysis but not necessarily in explosive analysis. The analysis of bulk explosives and explosive residue will be discussed.

Objectives:

At course completion student should be able to:

- Design a scheme to determine whether or not a particular explosive was used in an explosion
- Design a scheme to identify and quantify the components in bulk energetic mixtures
- Find the literature references which will help design the schemes above
- Understand the basics of validating an analytical scheme they have designed
- Identify the key parameters to ensure a scheme can be safely executed
- Perform basic calculations to predict explosives performance
- Select appropriate small scale laboratory tests to characterize explosives performance
- Assess sampling requirements for analysis of a post blast scene such as a weapons test

Expectations of a student will depend on his/her degree level and professional position.

IMMEDIATE BENEFITS: Each student who completes this course will gain an immediate set of peers who have had the same experience. He will also know several people who are daily involved in explosive analysis, whom he can call, as required. He will have several analytical schemes at his disposal.

Instructors:

Dr. Jimmie Carol Oxley is Professor of Chemistry at the University of Rhode Island (URI), co-Director of the Department of Homeland Security Center of Excellence in Explosive Detection,

Mitigation, and Response, and co-Director of the Forensic Science Partnership of URI. She earned a Ph.D. from the University of British Columbia (Chemistry) and joined the faculty of New Mexico Institute of Mining & Technology where she founded a Ph.D. program in explosives and created a Thermal Hazards Research group. Oxley's lab specializes in the study of energetic materials—explosives, propellants, pyrotechnics. Dr. Oxley is past chair of the Gordon Research Conference (GRC) on Energetic Materials; co-founder of Life Cycles of Energetic Materials and the GRC on Illicit Substance Detection. Oxley has authored 80 papers on energetic materials and worked on law enforcement issues—with the FBI simulating the World Trade Center bombing (1993), with FEL (UK) examining large fertilizer bombs, and with ATF studying the behavior of pipe bombs.

Dr. Maurice Marshall, OBE, is retired from the Defense Science & Technology Laboratory (UK) where he was Head of the Forensic Explosive Laboratory (FEL). FEL, founded in 1871, undertakes scientific investigations relating to the illegal use of explosives and provides a unique specialist service to Police forces in Great Britain as well as other bona fide clients. During Marshall's tenure the Laboratory investigated around 1800 cases both in Britain and abroad, and also conducted an active program of research into forensic aspects of explosives. Maurice Marshall gained his Doctorate in analytical chemistry from Imperial College London in 1972 and spent three years in private industry before joining the British Ministry of Defense.

Dr. James L. Smith is a Professor of Chemistry at University of Rhode Island. He co-directs a research group studying energetic materials. Smith earned a Ph.D. from the University of British Columbia (Chemistry) specializing in NMR analysis. He joined the faculty of New Mexico Institute of Mining & Technology where he became involved in both environmental and explosives programs. Smith's expertise is physical/analytical chemistry as applied to explosives and other energetic materials. His specialties include chromatography, mass spectrometry, thermodynamic properties and thermal analysis as applied to energetic materials. He has over 50 publications in the field.