

Solid-Phase Extraction Course

Presented by Sample Prep Solutions

Course Description

This practical 1.5 day course teaches the fundamental strategies for using solid-phase extraction (SPE) to prepare samples for chromatographic analysis. A thorough review of product formats, techniques and applications provides the student with the knowledge to use SPE efficiently and successfully. Valuable information is also presented on how to develop, optimize, and troubleshoot SPE methods. Discussions and problem-solving exercises are used to reinforce the subject material.

Target Audience

The course is intended for scientists and supervisors in all fields of analytical science who are interested in implementing and/or expanding their use of solid-phase extraction as a sample preparation technique. The topics presented will allow scientists to improve existing methods, develop new methods and increase their overall productivity. Beginners and current users of SPE will both benefit from the course material as taught by a recognized expert.

DAY 1

Strategies for Sample Preparation

- Importance of Sample Preparation
- Overview of General Techniques
- Basic Principles of Solid-Phase Extraction

Fundamentals of Extraction Chemistry

- Influence of pH on Ionization
- Matrix Effect and Recovery

Sorbent Chemistries and Attraction Mechanisms

- Silica, Polymer and Other Sorbents
- Reversed Phase, Ion Exchange, Mixed Mode and Normal Phase
- Primary and Secondary Interactions
- Choosing a Sorbent Phase

SPE Product Formats

- Sorbent Packaging as Packed Particle Beds and Disks
- Product Configurations and Sizes
- Accessory Products
- Off-Line Vs. On-Line Techniques

Review and Problem Solving Exercises

Applications for Solid-Phase Extraction

- Detailed Method Protocols
- Examples by Sorbent and Attraction Mechanism
- Resources for Finding SPE Applications

DAY 2

Strategies for SPE Method Development

- Generic Approaches–One Sorbent
- Selective Approaches–Multiple Sorbents
- Determining Load and Elute Conditions
- Importance of the Wash Solvent
- Influence of Sorbent Bed Mass on Capacity and Elution Volume

Method Optimization and Troubleshooting

- Influence of Method Variables on the SPE Process
- Common Reasons for Low Recovery
- Eliminating the Evaporation Step

Detailed Examples of SPE Method Development Projects

Review and Problem Solving Exercises

Resources for Further Information

About the Instructor

Dr. David Wells is President and Principal Scientist at Sample Prep Solutions Company in St. Paul, Minnesota. Sample Prep Solutions provides educational, consulting and technical support services to help pharmaceutical and biotech laboratory professionals improve sample prep productivity. Seminars and courses on solid-phase extraction, high throughput techniques, and automation strategies are frequently presented on request and at regional scientific conferences.

Dr. Wells has been involved with the development and implementation of high throughput techniques for sample preparation for most of his career. Prior to forming Sample Prep Solutions 5 years ago, David worked for the 3M Company for 12 years in various R&D positions in drug metabolism, bioanalytical chemistry, product development and technical service. While at 3M, he joined the company's entrepreneurial effort to develop sample preparation products based on a novel membrane technology. This project resulted in the manufacture, sale and support of solid-phase extraction disk cartridges and 96-well plates.

Recognized internationally as a leading authority in solid-phase extraction, David has published many articles on the subject. His writings include 18 papers, 3 book chapters and his own book published by Elsevier Science titled, "High Throughput Bioanalytical Sample Preparation: Methods and Automation Strategies." This book is an authoritative reference on the current state-of-the-art in sample preparation techniques for bioanalysis. David received his Ph.D. from the University of Kentucky College of Pharmacy and a B.S. from Ohio Northern University College of Pharmacy.