

## USE OF REFERENCE MATERIALS AND RESOURCES

**Tuesday, September 28, 2010 1:00 p.m. EDT**

Reference materials (RMs) can (should) be incorporated in all phases of analytical chemistry: from method development and validation to determination of method accuracy in routine use. In this session, we will cover what makes a good RM and the selection and use of RMs in these various situations. AOAC International's Technical Division on Reference Materials (TDRM) provides a number of resources to the reference material users community, including a pamphlet on the production and use of in-house RMs and a database of RMs organized by analyte, matrix, and Official Method, which will also be reviewed.

### **Chair:**

CHAIR: Katherine Sharpless

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### **Speakers:**

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### **Topic: What Makes a Good Reference Material or Spiking Solution?**

To ensure accuracy of results in the analytical laboratory, analytical chemists must rely on the accuracy, stability, and consistency of reference materials or spiking solutions.

There are several factors critical to production of a high-quality reference standard or spiking solution including raw material handling, characterization, and potency; certification and qualification of solutions; and homogeneity and stability of the solution. Certified analytical reference standard solutions prepared in a diluent that promotes stability and packaged under argon in flame -sealed ampoules can be stable for many years. This allows the laboratory the convenience of fewer lot changes and more consistent data over time.

This presentation walks through the parameters important to the manufacture, analysis, uncertainty and storage of certified reference standards, spiking solutions, and calibrators. Results are only as good as the reference.

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### **Topic: Use of RMs in Method Development and Validation**

Certified reference materials (CRMs) are important tools to enable and safeguard reliable analytical measurements and are typically used for calibration, method validation purposes, and method

performance verification. To fulfil their roles, they best comply with guidelines for the production and certification of reference materials (e.g., ISO Guides 34 and 35) and have to meet user requirements. Appropriate homogeneity and stability, property values with stated uncertainty and metrological traceability, suitable analyte level match as well as matrix and matrix format match, and an uncertainty fit for the intended use are the most important requirements for establishing suitable CRMs. The lecture reviews the definition of a CRM, elaborates on key requirements for materials and their implications, emphasizes criteria for the user to select suitable CRMs from information that is available on certificates and accompanying documentation, and highlights good practices of using CRMs in analytical laboratories. Reference to several examples from the area of food analysis (aflatoxins, veterinary drugs residues, proximates, contaminants) is made.

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**Topic: Use of RMs for Establishing Accuracy of Methods in Routine Use**

While method validation ensures that a method is valid for its intended purpose (fit for purpose), it does not assure that the data generated using the method during routine use remains valid. Many issues can arise that may lead to erroneous data generation and there are several methods used to monitor the performance of analytical methods in routine use. This presentation will focus on how reference materials (RMs) can be utilized to help ensure accuracy and precision in the day-to-day use of methods. Examples of qualitative and quantitative applications will be discussed as well as the benefits and limitations of using RMs.

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**Topic: TDRM Database of RMs**

Sourcing of matrix-matched reference materials can be somewhat of a treasure hunt. Find the right one and your path toward method validation or method verification is greatly improved. To improve the ease of locating prospective reference materials, TDRM began developing a database with search capabilities based on matrix, analyte or OMA method. Initial work was done to develop the model using Microsoft Access. This model was used to build the current online version of the database which is being presented and is now being made available for first review to TDRM members.