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**Eichrom Technologies LLC
Annual Users' Group Meeting
Held at the 60th Annual**



Radiobioassay & Radiochemical Measurements Conference

Tuesday, 28 October, 2014

Holiday Inn Downtown World's Fair Park



Knoxville, Tennessee

Agenda and Notes

13:00-13:10

Introductions:
Terence O'Brien

1. 13:10-13:45

Radium Isotopes by Alpha Spectrometry
Terry Romanko, TestAmerica

Radium isotopes are initially separated from the sample matrix by coprecipitation with calcium carbonate. The radium is further purified using cation-exchange and extraction chromatography resins. The final eluant containing the radium is coprecipitated with a small, controlled amount of barium as the sulfate and collected on a 0.1 micron filter. Radiometric yield is determined by alpha spectrometry of traced ^{225}Ra (inferred from ^{217}At) during the analysis count along with the ^{226}Ra and ^{224}Ra (inferred from the ^{216}Po or ^{212}Po daughter).

2. 13:45-13:55

Additional Uses for Sr and Pb Resins,
Andrew Knight, University of Iowa

This presentation discusses the application of Sr Resin and Pb Resin for Ga, Po, and Pa analysis.

3. 13:55-14:35

Rapid method for Actinides in Asphalt and Soil Samples.,
Sherrod Maxwell, Savannah River National Laboratory

A new rapid method for the determination of actinides in asphalt samples has been developed that can be used in emergency response situations or for routine analysis. The new method for the determination of actinides in asphalt utilizes a rapid furnace step to destroy bitumen and organic components in the asphalt samples and sodium hydroxide fusion to digest the remaining sample. Sample preconcentration steps are used to collect the actinides and a new stacked TRU Resin + DGA Resin column method is employed to separate the actinide isotopes in the asphalt samples. This approach has a sample preparation time for asphalt samples of <8 hours. In addition, other flexible, rugged options will be presented. In light of the problems associated with refractory U in MAPEP 30 soil by 80% of participating laboratories, MAPEP 30 soil results using a new rapid fusion TEVA+TRU option for Pu, U, Th will be presented.

4. 14:35-15:00 **Eichrom Resin Shelf-life**
Daniel McAlister; J. Bryant; S. Tejchma; E. Rush,
Eichrom Technologies

Eichrom scientists have recently performed extensive testing on the performance of quality control retains for all Eichrom resins, dating back as far as 2001. Results of this testing were initial presented in a report to the CDC in 2010. During the course of testing most resins, including lots produced over ten years ago, still passed all quality control tests. The only exceptions were some lots of bulk Sr Resin, which exhibited very poor performance. Extensive in house testing and coordination with customers suggested potential issues for bulk Sr resin (but not 2mL prepacked cartridges or columns) after storage for more than 1.5 years. An update on Sr Resin performance, efforts to understand and solve the issues.

15:00-15:30 **Break**

5. 15:30-15:45 **Zirconium Separations with Eichrom Resins**
Simon Jerome – National Physical Laboratory

6. 15:45-16:25 **Separation of Mock Used Fuel and Mock Glass Debris using Eichrom Resins**
Audrey Roman, R. Springs, E. Bond, R. Sudowe –
University of Nevada Los Vegas / Los Alamos National Laboratory

Novel separation schemes could be of great benefit for a wide range of applications, such as nuclear forensics and safeguards. For this reason, Eichrom's resins, DGA and UTEVA resins were well characterized for various matrices to develop potential novel separation schemes. The separation of Am, Pu, and U from mock used fuel and the separation of some short-lived fission products from mock glass debris were developed. These separation schemes will be presented and novel findings discussed.

7. 16:25-16:35 **Polonium Analysis in Complex Samples**
Andrew Nelson, University of Iowa

This presentation discusses the application of TRU resin en lieu of Sr Resin to analyze Po in complex environmental samples.

8. 16:35-17:10 **Eichrom Method and Application Notes Updates**
Daniel McAlister, Eichrom Technologies

Eichrom methods for the measurement of radionuclides in a wide range of matrices have been extensively updated in 2014. Updates include reformatting and reorganization to improve clarity and ease of use, incorporating new literature references for background and performance data, and more detailed notes with tips for ensuring optimal method performance. In addition, application notes, based on recent publications, have been generated covering additional matrices and rapid separation and measurement techniques. The scope of method updates and expected availability of the updated methods and application notes via Eichrom's website will be discussed. Additionally, customer questions and comments on topics such as valence state adjustment, improving yield and decontamination factors of separations, and preparing samples for analytical measurement techniques will be addressed.

9. 17:10-17:20 **Ion Exchange Chromatography (IX) vs. Extraction Chromatography (EXC)**,
Eric Eitrheim, University of Iowa

This presentation probes at the subtle and often confusing differences between ion exchange and solvent extraction chromatography.

- 17:20-17:30 **Addition time for Questions and Answers**
Terence O'Brien