Eichrom Users' Group Round Table:

Questions and "Soulful Cogitations" to your most vexing separations:

Panelists: Dr. Phil Horwitz; Dr. Dan McAlister, Mr. Sherrod Maxwell and Mr. Lawrence Jassin

#	Question
1	Can Eichrom develop a Ni-63/Fe-55 procedure where only one column is used to separate the two nuclides? I presently perform a hydroxide precipitation for both Fe-55 and Ni-63, and then have to use the TRU column to holdup the Fe-55. I collect the first eluents and perform additional preparation, then use the Nickel Column. It would be very beneficial to be able to do one prep and two elutions using the SAME column. The final two solutions must also be able to be analyzed using liquid scintillation and meet MDA of 30 pCi/l for Ni-63 and 250 pCi/l for Fe-55.
2	How would the Eichrom 2mL columns or cartridges handle the following issues: 1. Fe separation from Uranium/Plutonium? I have as much as 30.0g of Iron/nickel/Chromium; 2. Separation of Be Oxide from Pu oxide? This is in the same solution as above; 3. Also in the solutions is an organic compound that is shiny in nature and gums up the works. Have tried pre-filters as well as glass fiber as well as paper. Have tried muffle furnace, wet ashing with aqua regia, peroxide, Nitric and HCL. Am not allowed to do fusions or use H2SO4 or HClO4. Something always slips through. 4. This solution was run through 5 anion columns (10cm or resin in your standard glass column).
3	Piggy backing TEVA and UTEVA columns allow for multi-nuclide separations. As a vacuum box speeds these separations and minute drops come off the columns, what is the best technique to ensure clear complete separations that maximize recoveries?
4	What are the performance differences possible between using resins in a column geometry versus batch contact?
5	Is there a theoretical maximum Kd for extraction resins? In other words, is there the potential for resins for far better Kd performance?
6	In a column geometry, are their practical limitations to the effective Kd that can be accomplished, e.g. physical hold up?
7	Is there a good compilation of the various reagents (ascorbic acid, ferrous sulfamate, etc.) that are useful to achieve valence adjustments for the actinides and other groups?
8	As a resin bed approaches capacity, what happens to the loading of competing analytes?
9	Does a calcium in solution interfere with the ability of TEVA, TRU, or DGA resins to bind Am, Pu, Th, or U? (A): Max. calcium .95g in a 3g mass of digested bone ash (NIST SRM 4356) (B): Prepared by microwave assisted digestion and subsequent oxidation state adjustment in substantial accordance with Maxwell, S.L.; Faison, D.M.; Hutchinson, J.B., New Method for Determination of Actinides and Strontium in Animal Tissue, Journal of Radioanalytical and Nuclear Chemistry, Vol. 275, No. 3 (2007) (available on Eichrom web site).
10	When simultaneously running multiple splits of a single homogenous sample through 1mL TEVA cartridges on a vacuum box, what could cause a portion of the cartridges to run markedly slower (hours v minutes)? This same behavior was observed with 2mL cartridges.
11	In a TEVA-TRU-DGA cartridge system, what does a blue color change (or lack thereof) mean in the TRU and DGA cartridges after loading the column? (Why do we sometimes see blue color in the TRU and DGA cartridges and sometimes not, even when running splits of the same homogenous base sample).
12	Can extended residence time (very slow loading, >30 min) of load solution in a cartridge impact the amount of material recovered?
13	Other than influencing run times, what impact does visosity have on TEVA, TRU, and DGA resins?