

2022 EICHROM WORKSHOP/USER'S GROUP MEETING

Workshop Organizer: Daniel McAlister, Ph.D.

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Eichrom would like to invite attendees of the 2022 RRMC to the Eichrom Workshop and User Group Meeting. The workshop will be a forum to discuss recent developments at Eichrom and the application of extraction chromatography, ion exchange and other radiochemical separations methods to radioanalytical chemistry, isotope production, and nuclear medicine. In addition to the planned agenda, time will be allotted for an open forum discussion of separation issues and questions supplied by the audience.

Details for the online virtual workshop will be provided in advance of the meeting date. Workshop presentations will also be posted to www.eichrom.com following the conference.

Agenda:

Welcome	Andrew Dockweiler	Director of Sales and Marketing Eichrom Technologies, LLC
Introduction	Michael Fern	President Eichrom Technologies, LLC
Resolve Filters	Madeleine Eddy, Ph.D.	Assistant Chemist Eichrom Technologies, LLC
Sr Resin Shelf-Life	Daniel McAlister, Ph.D.	Group Leader – R&D Eichrom Technologies, LLC
EXC Resin based on the DOODA Extractant	Madeleine Eddy, Ph.D.	Assistant Chemist Eichrom Technologies, LLC
Why Resins Work	Daniel McAlister, Ph.D.	Group Leader – R&D Eichrom Technologies, LLC
Q&A Session		

Abstracts:

Welcome Andrew Dockweiler

Andrew Dockweiler, the director of sales and marketing for Eichrom, will welcome attendees to the Workshop, review the agenda, and introduce the speakers.

Introduction Michael Fern

Mike Fern, Eichrom President, will begin the workshop by providing an update on changes at Eichrom since the last RRMC and describe Eichrom's efforts to minimize the impact of supply chain issues on Eichrom customers.

Resolve Filters Madeleine Eddy, Ph.D

Due to changes in the manufacturing process, the original Resolve Filter polypropylene membrane is no longer available. Eichrom secured a large supply of the polypropylene membrane to continue supplying Resolve Filters while other membrane types and suppliers could be studied. After evaluation of many different membrane materials (polypropylene, polyethylene, polysulfone, PTFE), a polyethylene material was found that exhibited nearly identical physical properties and performance in alpha spectrometry to the original polypropylene membrane. Evaluation data for the new material will be presented, along with a review of the process for preparing sources for alpha spectrometry by collection of rare earth micro-precipitates onto resolve filters.

Sr Resin Shelf-Life Daniel McAlister, Ph.D.

At the 2014 RRMC, Eichrom presented data on a 10+ year shelf-life study of our resins. Sr Resin was the only Eichrom EXC material that showed any significant decrease in performance over the time period tested, with near total failure of some lots 1.5 – 2.0 years after manufacturing. Data available in 2014 suggested the issue was isolated to bulk bottles of Sr resin (not pre-packed cartridges or columns), was exacerbated by exposure of the resin to very warm or cold conditions, and was likely not due to chemical decomposition of the extractant but to slow solidification of the crown ether in the pores of the resin. Investigation of the issue resulted in changes to our

manufacturing process to decrease the likelihood of resin failures and changes to our quality control process to implement routine shelf-life testing of each lot of bulk bottle Sr resin at six-month intervals for two years post manufacturing. An update to Sr Resin monitoring data and an extension of the testing to pre-packed columns and cartridges will be presented.

An EXC resin based on the DOODA extractant Madeleine Eddy, Ph.D.

Evaluation of a new EXC resin based on the DOODA extractant will be presented. The extractant is similar to DGA, with an additional ether oxygen bridging the two amide groups. The basic properties of the resin and its performance in a wide range of separations will be presented and compared to DGA, Normal and DGA, Branched resin. Applications of the DOODA resin in a wide variety of applications, including analytical separations, the production of key nuclear medicine isotopes (^{111}In , ^{68}Ga , ^{89}Zr , ^{44}Sc and ^{225}Ac), and rare earth separations will be presented.

Why Resins Work Daniel McAlister, Ph.D.

A review of some of the basic chemistry of EXC resins will be presented, focusing on the properties that can be utilized to improve resin performance and separation efficiency. The rationale for the formulation of Sr and Pb resins, as well as the interaction of multiple extractants on a single resin, will be utilized to illustrate various concepts. The application of these principles to other separation types in analytical and isotope production applications (precipitation, solvent extraction, ion-exchange) will also be discussed.