

RadChem *Info*

Resins

Resolve™ Filter

Agenda

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eichrom

Expertise. Commitment. Results.



Eichrom Europe

Campus de Ker Lann • Parc de Lormandière, Bât. C,
Rue Maryse Bastié • 35170 Bruz – France
Tel. : +33 (0)2 23 50 13 80 • Fax : +33 (0)2 23 50 13 90
e-mail : eichromeurope@eichrom.com

Editorial

Nearly two years have passed since Eichrom has moved its European facility to the Campus of Ker Lann, near Rennes, and today we are pleased to inform you about our evolution.

Our laboratory for radiochemical analysis of drinking water, under the responsibility of Patrice Letessier, has not only obtained its COFRAC accreditation (program 135) but also the agreement of the French Ministries of Health and Environment.

We have opened a new Research and Development Laboratory with the aim to respond your current and future needs in radiation protection and radiochemistry. Our laboratory is headed by Steffen Happel, a PhD chemist, who has several years of experience in radiochemistry and is well aware of the issues laboratories face day to day.

With the aim to continuously improve our services and strengthen our customer relationships, we have hired a new product manager. Aude Bombard, a PhD radiochemist, has joined the team in March 2005 and will assist you with all questions concerning our resins, procedures and new developments.

These changes come along with the renewal of the quarterly newsletters, now called RadChem Info, and the Users' Group Meetings, which will take place in autumn 2005.

I cordially invite you to participate with your suggestions and presentations, and look forward to seeing you there.

Michaela Langer
General Manager
Eichrom Europe

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Resolve™ Filters

Results obtained with Resolve™ Filters

Resolve™ filters are used to prepare sources for the alpha spectrometric determination of uranium, americium, plutonium and radium by micro-precipitation. Resolve™ filters are made from polypropylene and are 25 mm in diameter with a porosity of 0.1 µm.

Maximum peak resolution in alpha spectrometry requires as uniform a filter surface as possible to ensure a uniform deposition. Therefore, Resolve™ filters undergo a strict quality control including an electron microscopic examination of the surface and an evaluation of the quality of the thin-layer deposits obtained by micro-precipitations.

The Resolve™ filters have been evaluated for use in our water analysis laboratory for the determination of U, Am, Pu (micro-precipitation with LnF₃) and Ra-226 (micro-precipitation with BaSO₄) via alpha spectrometry, respectively figures 1 and 2. Repeatability and reproducibility of U, Am, Pu and Ra-226 sources were determined with respect to the variation of peak area (Table 1) and FWHM (Table 2). Repeatability and reproducibility of the peak area and FWHM are good with standard deviations less than 6 % and less than 15 % respectively.

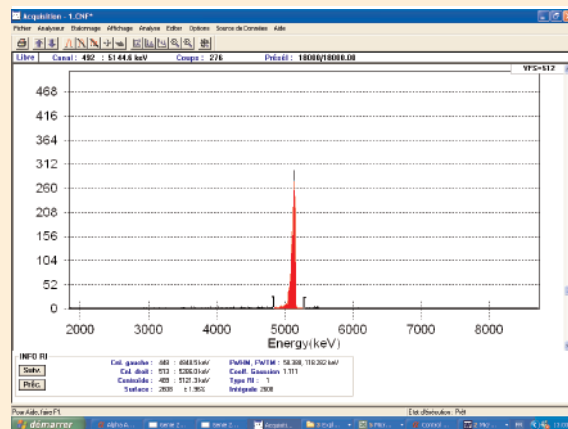


Figure 1 : Alpha spectra of Pu-239 micro-precipitated source. Resolution (FWHM) mean: 55.3 keV.

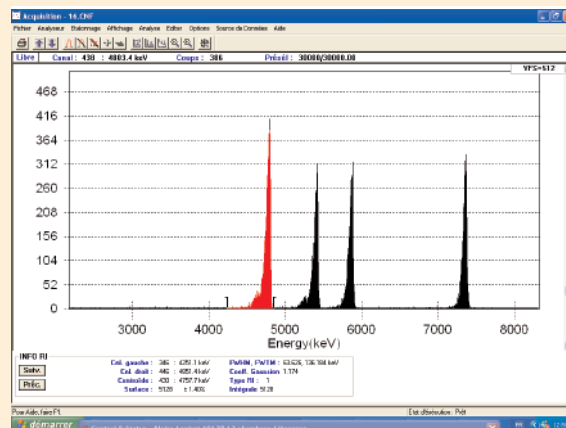


Figure 2 : Alpha spectra of Ra-226 micro-precipitated source. Resolution (FWHM) mean: 55.3 keV.

RN(*)	Repeatability		Reproducibility	
	Nb of replicates	Standard deviation (%)	Nb of replicates	Standard deviation (%)
U-232	9	1,9	6	4,6
Am-243	10	1,4	6	2,2
Pu-239	9	4,1	6	6,4
Ra-226	10	3,1	6	4,6

Table 1 : Repeatability and reproducibility of the peak area for thin-layer deposit by micro-precipitation of U-232, Am-243, Pu-239 and Ra-226 on Resolve™ filter. (*) RN : Radionuclide.

RN	Repeatability		Reproducibility	
	Nb of replicates	Standard deviation (%)	Nb replicates	Standard deviation (%)
U-232	9	3,7	6	12,6
Am-243	10	7,3	6	12,3
Pu-239	9	9,0	6	9,5
Ra-226	10	11,4	6	10,1

Table 2 : Repeatability and reproducibility of the FWHM for thin-layer deposit by micro-precipitation of U-232, Am-243, Pu-239 and Ra-226 on Resolve™ filter.

Radium radio-isotopes in general and Ra-226 in particular need specific conditions to be electro-deposited. Micro-precipitation of Ra-226 in with baryum sulfate offers an interesting alternative. Figure 3 presents the results obtained during a linearity test (varying Ra-226 activity) of the micro-precipitation of Ra-226. The results show that this preparation method of Ra-226 is efficient over a wide range of activities.

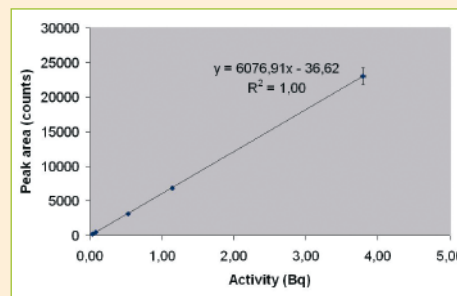


Figure 3 : Linearity test, peak area at 4784 keV vs Ra-226 activity.

Please contact us for receiving Resolve™ Filter samples.

Resins

Analytical grade ion exchange resins

Ion exchange resins are omnipresent in the field of analytical chemistry and their quality is key to reliable and reproducible results. Therefore, Eichrom focuses on the purification of the analytical grade ion exchange resins. Successive rinses of methanol, NaOH and HCl are employed to remove residual organic molecules remaining from the manufacturing processes.

If you wish to compare performance and prices of our resins to the ones you currently use, please contact us and we will provide you with a complimentary sample.

Eichrom Part number	Description	Ionic form	Mesh (wet)	Bio-Rad Part number	Bio-Rad Product
Anion exchange resins					
A8-B500-C-CL	Analytical Grade Anion Exchange 1x8 Resin	Chloride	50-100	140-1431	AG@ 1-X8
A8-B500-M-CL		Chloride	100-200	140-1441	AG@ 1-X8
A8-B500-F-CL		Chloride	200-400	140-1451	AG@ 1-X8
A4-B500-C-CL	Analytical Grade Anion Exchange 1x4 Resin	Chloride	50-100	140-1331	AG@ 1-X4
A4-B500-M-CL		Chloride	100-200	140-1341	AG@ 1-X4
Cation exchange resins					
C8-B500-C-H	Analytical Grade Cation Exchange 1x8 Resin	Hydrogen	50-100	142-1431	AG@ 50W-X8
C8-B500-M-H		Hydrogen	100-200	142-1441	AG@ 50X-X8
C4-B500-M-H	Analytical Grade Cation Exchange 1x4 Resin	Hydrogen	100-200	142-1341	AG@ 50W-X4

Please note that this resin cross-reference should be used strictly as a product guide and should not be construed as a list of equivalents. AG is a registered trademark of Bio-Rad Laboratories, Inc. Please contact Eichrom for complete product specifications and for the availability of additional resins and mesh size.

Technical Info

In the past, the separation of americium and radium from various matrices has always been a challenge. With our Diglicolamide (DGA) Resin and MnO₂ Resin, we offer a new approach

Diglicolamide (DGA) resin

DGA resin, unlike the other resins used for the separation of actinides, shows a great affinity with americium, in both nitric and hydrochloric acid media.

Besides its affinity for americium, DGA resin may also be used for actinium-228 separation.

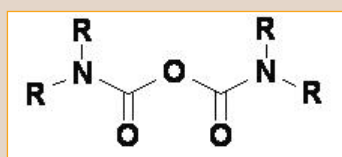


Figure 4 : TN-DGA Resin Extractant (N,N,N',N'-tetra-n-alkyl-3-oxopentanediamide)

MnO₂ resin

MnO₂ resin finds its first use for the separation of radium-226 and radium-228. The baryum-133, which is a chemical analog of radium and used as a tracer, is fixed on the resin for a pH range of 4 to 8 (figure 5).

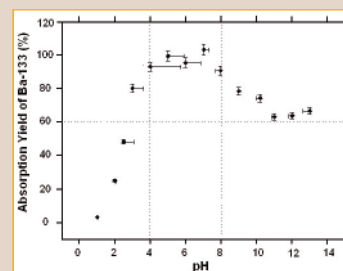


Figure 5 : Absorption yield of Ba-133 on MnO₂ with respect to pH.

For more information see the upcoming RadChem Info or contact us directly.

Agenda

RadChem Info

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We will be present at

- > **Procorad** : 14-16th June 2005, Bruges – Belgium
- > **3rd pre-conference workshop : Advanced Techniques and Radionuclide Speciation within Radioecology** : 30th September – 2nd October 2005, Monaco
- > **2nd International Conference on Radioactivity in the Environment and the 6th International Conference on the Environmental Radioactivity in the Arctic and Antarctic** : 2nd – 6th October 2005, Nice – France
- > **Asia-Pacific Symposium on Radiochemistry '05** : 17th – 21st October 2005, Beijing – China
- > **LSC 2005 Conference: Advances in Liquid Scintillation Spectroscopy** : 17th – 21st October 2005, Katowice – Poland

Users' Group Meetings

- > **14th September 2005** : Düsseldorf (abstracts due on 15th July)
- > **4th November 2005** : Rennes (abstracts due on 15th September)
- > **9th December 2005** : Manchester (abstracts due on 1st October)

Please send back this flyer by fax : +33 (0)2 23 50 13 90 or by mail

I would like to participate to the Users' Group Meeting in :

- Düsseldorf - German Rennes - French Manchester - English

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