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Dear customers,

The year 2018 was very successful for TrisKem! Our new TK201 Resin we've been working on this year is finally on the market. This resin is allowing for the determination of Tc-99 in environmental and decommissioning samples. It may further be used in combination with the CU resin for the purification of Cu isotopes for medical use.

A new project C.L.I.P.S. 2020 (Design of innovative lines of semi-industrial production) has been launched.

This project will allow us to supply from a few tens of kilos to a ton of resins for process applications such as e.g. decontamination of effluents in short time delays and at competitive rates for the market to meet your requests!

To achieve this project, we have added new skills to our team. Four specialists have joined TrisKem, which now counts 12 chemists including 6 PhD.

The C.L.I.P.S 2020 project has been supported by BPIfrance as part of its 2018 Innovation Trophy; TrisKem was chosen as one of the laureates in the "French Fab" category.

This Trophy has been a reward for our many years of R & D. It has also reinforced our vision on the importance of innovation being at the heart of our strategy since the beginning.

Our new website was launched in May 2018. This RWD site, in addition to a rich content, will allow us to keep in contact with you and to inform you of our news! Please don't hesitate to also subscribe to our newsletter to stay informed

Thank you for visiting our booths at the many conferences we attended in 2018 and your positive feedback on our website! It's always a great pleasure to exchange and share our expertise with you.

We thank you for your trust!

TrisKem International Team

● TK201 Resin

The TK201 Resin is based on a tertiary amine, it further contains a small amount of a long-chained alcohol (radical scavenger) to increase its radiolysis stability. The TK201 Resin rather acts as a weaker ion pair binding agent compared to the TEVA Resin, accordingly it is generally possible to elute under softer conditions.

Its main application is the separation of anionic species such as Tc(VII) or Re(VII).

Graph 1 shows the D_w values for Tc in HNO_3 and HCl.

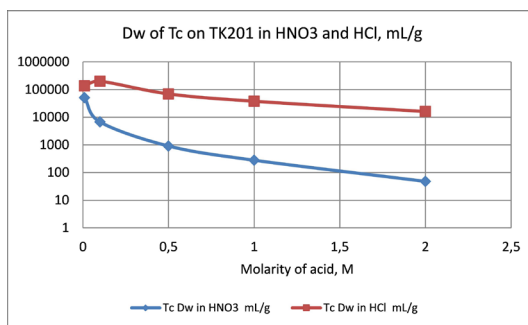


Figure 1: D_w values of Tc on TK201 Resin in HCl and HNO_3 , obtained by LSC, data provided by N. Vajda (RadAnal)

Tc(VII) is very well retained at low acid concentrations. Its retention is generally significantly higher in HCl than in HNO_3 , even at elevated HCl concentration such 2M it remains very strongly retained. In HNO_3 on the other hand its retention is rather low at concentrations above 2M.

Graphs 2 – 6 show the selectivity of the TK201 Resin for a wide range of elements in HCl (fig. 2 – 4) and HNO_3 (fig. 5 and 6). All D_w shown in these graphs were obtained through ICP-MS measurements.

As expected, the TK201 Resin shows very high retention of Re(VII) in HCl even at rather elevated acid concentrations. Further Zn, Ga and Cu are retained, especially the latter allows for its use in radiopharmaceutical applications.

The TK201 Resin also shows strong retention of U and Pu at elevated HCl concentrations, both might subsequently be eluted in dilute acid.

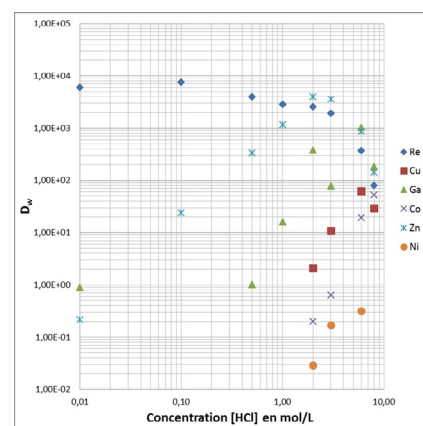


Figure 2: D_w values of selected elements on TK201 Resin in HCl

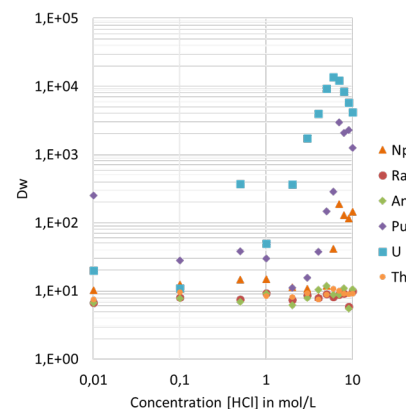


Figure 3: D_w values of selected elements on TK201 Resin in HCl, data provided by Russell et al. (NPL)

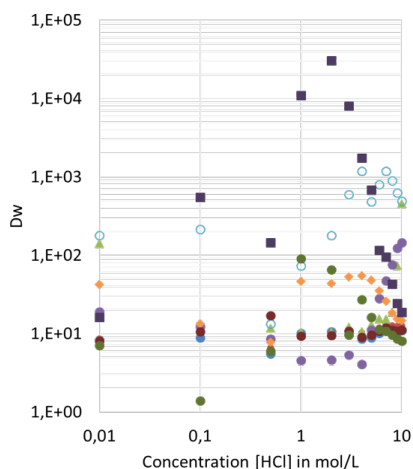


Figure 4: D_w values of selected elements on TK201 Resin in HCl, data provided by Russell et al. (NPL)

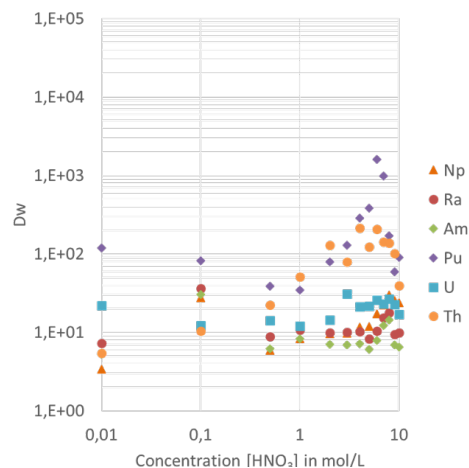


Figure 5: D_w values of selected elements on TK201 Resin in HNO_3 , data provided by Russell et al. (NPL)

News

New LSC Consumables TechDoc

You'll find an updated version of our LSC Consumables TecDoc online on our web site (<http://www.triskem-international.com/lsc-consumables.php>). Therein you'll find technical information on LSC cocktails and other LSC consumables in a new more structured and clear layout.



New publications

You'll find a new space on our website (<http://www.triskem-international.com/new-publications.php>) that is dedicated to new publications based on extraction chromatography, we hope you'll find this helpful for your work! We are updating the web site regularly, so please don't hesitate to check frequently.

The TK201 Resin further strongly retains Bi and Mo at elevated HCl concentrations, while other elements tested show no or only very low retention (Ru, Nb).

The TK201 Resin generally shows rather limited selectivity in HNO_3 , similar to Tc(VII) Re is well retained at low HNO_3 concentrations (0.01 – 0.1M HNO_3). At elevated HNO_3 concentrations Pu is well retained and Th fairly well, other actinides are not retained under these conditions.

Out of the other elements tested only Bi (at about 0.5M HNO_3) and Mo (at low HNO_3 concentrations) are retained.

It is important to note that Mo is not retained at HNO_3 concentrations above 0.5M while Tc and Re are well retained (Fig. 1), allowing for their clean separation.

It could further be shown by Vajda et al. that D_w values for Tc(VII) are very low in dilute NH_4OH : in 0.1M NH_4OH Tc(VII) shows a D_w of only ~2, accordingly it is easily eluted by $\geq 0.1M NH_4OH$.

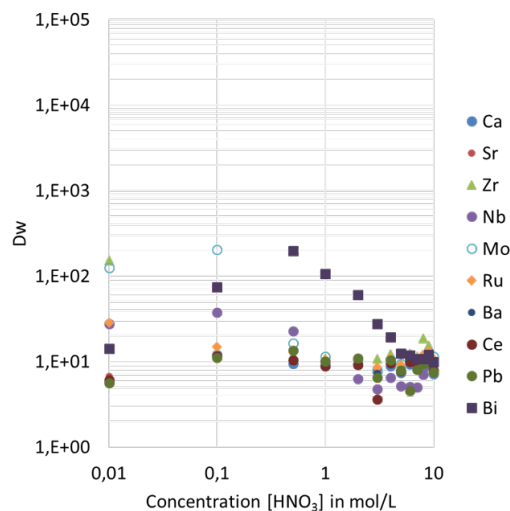
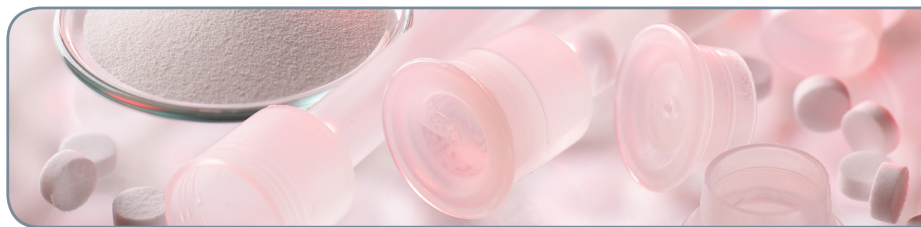


Figure 6: D_w values of selected elements on TK201 Resin in HNO_3 , data provided by Russell et al. (NPL)



Additional elution studies indicated that an efficient Mo separation from Re is possible (Fig. 7) using 0.7M HNO₃ for Mo removal and dilute NH₄OH for Re elution.

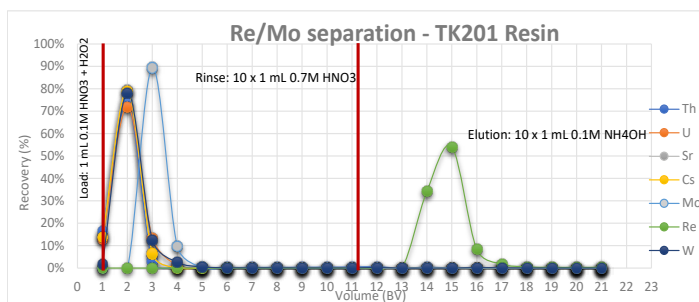


Figure 7: Elution study, Re separation from various elements (incl. Mo and W).

Vajda et al. could confirm that Tc is, like Re, not eluted in 0.7M HNO₃, validating that Re is a good surrogate for Tc and thus also allowing an efficient Mo/Tc separation. Most suitable conditions for Tc elution were found to be NH₄OH greater or equal to 0.2M (Fig. 8).

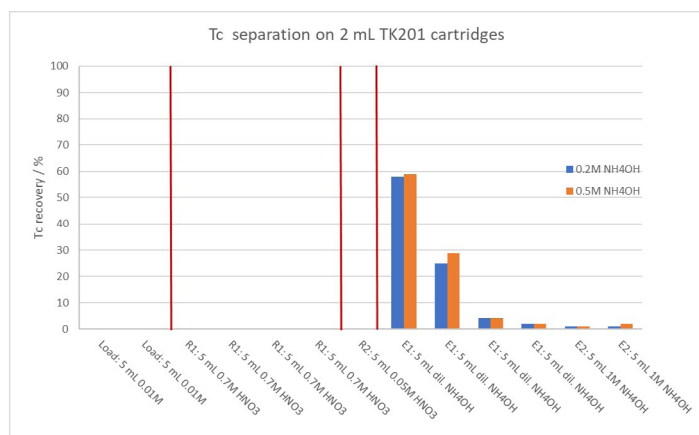


Figure 8: Elution study, Tc separation on 2 mL TK201 cartridges, data provided by N. Vajda (RadAnal)

Another application of the TK201 Resin is the separation of Cu isotopes, in combination with the CU Resin, from irradiated solid Ni targets.

While CU Resin shows very high selectivity for Cu over Ni, Zn, Ga,... it requires loading at pH ≥ 2 which is not easily compatible with solid Ni target dissolution and separation chemistry, as these are generally dissolved in strong HCl.

TK201 Resin may be used to retain Cu from 6M HCl, while letting Ni pass for subsequent recycling. The Cu may then be eluted under suitable conditions (e.g. using a mixture of NaOH and acetate buffer at pH 3) allowing for direct loading onto CU Resin for further purification. It might also be used to convert the Cu fraction eluted from the CU Resin from highly acid (e.g. 6 - 8M HCl) to conditions more suitable for labeling (e.g. dilute HCl) as indicated in Fig. 9.

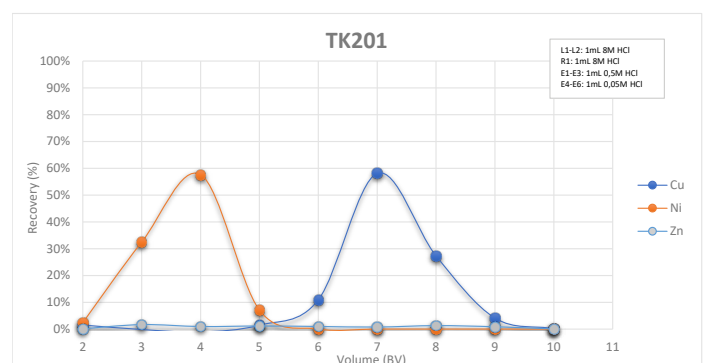


Figure 9: Elution study, Cu conversion on TK201 Resin

Main applications:

- Separation of technetium
- Separation of rhenium
- Separation of Cu isotopes (in combination with CU Resin)

Bibliography:

- (1) A. Bombard et al. "Technetium-99/99m New Resins Developments For Separation And Isolation From Various Matrices", presented at the ARCEBS 2018, 11-17/11/18 - Ffort Raichak (India)



● Agenda

TrisKem will be participating to the following upcoming conferences and is very much looking forward to meeting and discussing with you there!

Booth at 11th International Symposium on Targeted-Alpha-Therapy (TAT11), <https://www.tat11.com/>, 01/04 - 05/04/19, Ottawa (Canada)

38th Annual Meeting UK Co-ordinating Group for Environmental Radioactivity (COGER), <https://southwestnuclearhub.ac.uk/event/coger-conference-2019/>, 24/04 - 26/04/19, Bristol (UK)

MEDICIS-Promed Final Conference, <http://medicis-promed.web.cern.ch/updates/2018/12/medicis-promed-final-conference-30-april-4-may-2019-erice-sicily-italy>, 30/04 - 04/05/19, Erice/Sicily (Italy)

Booth at 2nd International Conference on Radioanalytical and Nuclear Chemistry (RANC 2019), <https://jrnc-ranc.akcongress.com/index.php/conference>, 05/05 - 10/05/19, Budapest (Hungary)

Booth at 23rd International Symposium on Radiopharmaceutical Sciences (ISRS 2019), <https://www.srsweb.org/isrs2019/>, 26/05 - 31/05/19, Beijing (China)

Targeted Radiopharmaceuticals Summit (TRP), <https://targeted-radiopharma.com/>, 11 - 13/06/19, Munich (Germany)

Procorad, <http://www.procorad.org/en/register/Next-Meeting>, 19/06 - 21/06/19, Budapest (Hungary)

Booth at SNMMI 2019 Annual Meeting, <http://www.snmmi.org/AM/>, 22/06 - 25/06/19, Anaheim, CA (USA)

Booth at Goldschmidt 2019, <https://goldschmidt.info/2019/>, 18 - 23/08/19, Barcelona (Spain),

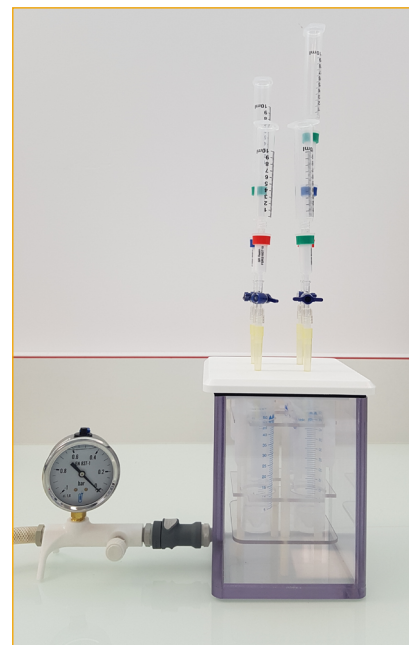
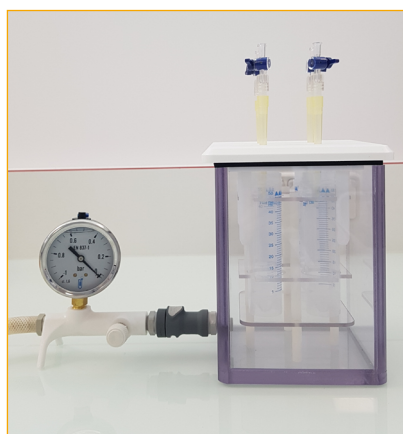
You'll find an update on our participations to conferences on our website :

www.triskem.com

● NEW products

New 4 positions vacuum box available soon

Following numerous requests, we have started working on a new smaller 4 position vacuum box for use with small sample number and in restraint spaces. The boxes will be integrated into our price list starting April 1st. For more information please contact us contact@triskem.fr.



You'll find two new application notes for the DGA Sheets (**Ac-227/Ra-223** and **Ge-68/Ga-68**) on our website:

<http://triskem-international.com/tki-methods.php>