

Accepted Manuscript

Title: Decontamination of spent ion-exchangers contaminated with cesium radionuclides using resorcinol-formaldehyde resins

Author: Marina Palamarchuk Andrey Egorin Eduard Tokar
Mikhail Tutov Dmitry Marinin Valentin Avramenko



PII: S0304-3894(16)30808-1
DOI: <http://dx.doi.org/doi:10.1016/j.jhazmat.2016.09.005>
Reference: HAZMAT 18011

To appear in: *Journal of Hazardous Materials*

Received date: 16-7-2016
Revised date: 31-8-2016
Accepted date: 3-9-2016

Please cite this article as: Marina Palamarchuk, Andrey Egorin, Eduard Tokar, Mikhail Tutov, Dmitry Marinin, Valentin Avramenko, Decontamination of spent ion-exchangers contaminated with cesium radionuclides using resorcinol-formaldehyde resins, Journal of Hazardous Materials <http://dx.doi.org/10.1016/j.jhazmat.2016.09.005>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

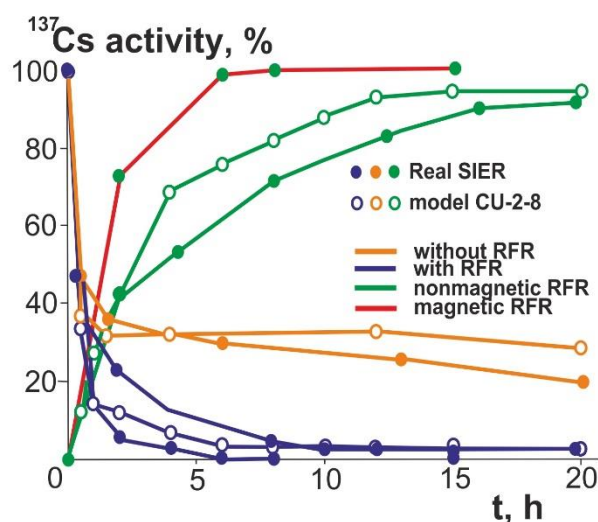
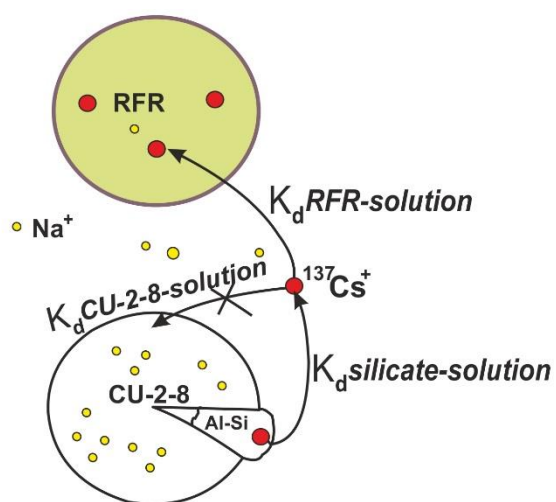
Decontamination of spent ion-exchangers contaminated with cesium radionuclides using resorcinol-formaldehyde resins

Marina Palamarchuk*, Andrey Egorin, Eduard Tokar, Mikhail Tutov, Dmitry Marinin, Valentin Avramenko

Institute of Chemistry, Far-Eastern Branch, Russian Academy of Sciences, 159, prosp. 100-letiya Vladivostoka, Vladivostok 690022, Russia

* Corresponding author, Tel: +7 4232 311889; E-mail address: marina_p@ich.dvo.ru

Graphical abstract



Highlights:

- Cesium radionuclides not removable by regeneration are bound to silicate deposits.
- Application of RFR substantially increases cesium desorption from an ion-exchanger.
- The radwaste volume was reduced at least 2-fold for zeolites and 10-fold for SIER.
- The distribution coefficient values for RFR were high ($K_d > 10^4$) after 6 regenerations.
- The volume of secondary waste formed after regeneration of RFR was reduced 600-fold.

Abstract: The origin of the emergence of radioactive contamination not removable in the process of acid-base regeneration of ion-exchange resins used in treatment of technological media and liquid radioactive waste streams has been determined. It has been shown that a majority of cesium radionuclides not removable by regeneration are bound to inorganic deposits on the surface and inside the ion-exchange resin beads. The nature of the above inorganic inclusions has been investigated by means of the methods of electron microscopy, IR spectrometry and X-ray diffraction. The method of decontamination of spent ion-exchange resins and zeolites contaminated with cesium radionuclides employing selective resorcinol-

Download English Version:

<https://daneshyari.com/en/article/4980057>

Download Persian Version:

<https://daneshyari.com/article/4980057>

[Daneshyari.com](https://daneshyari.com)