

NEW APPROACH OF USING IONIC LIQUIDS (ILS) AS GREEN EXTRACTANTS IN THE ADSORPTION PROCESS OF RADIONUCLIDES FROM WASTE AQUEOUS SOLUTIONS

Goal of the project:

The overall goal of the proposed project is to investigate a new approach of using the room temperature ionic liquid (RT IL) as extractants impregnated onto various solid supports in the adsorption process of radionuclides from waste aqueous solutions. The project has an interdisciplinary character presenting an integrated concept of waters depollution with radionuclides content

Short description of the project

Various ionic liquid impregnated materials are obtained and after a complex characterization they are used in the adsorption process of different radionuclides from synthetic and real aqueous solutions.

Project implemented by

Faculty of Industrial Chemistry and Environmental Engineering

Implementation period

01.05.2013 - 30.09.2016

Main activities

1. Impregnation of various ILs onto various solid supports using various methods of impregnation (2013);
2. Characterization of the obtained ionic liquid impregnated materials (2013);
3. Removal of various radionuclides from aqueous solutions through adsorption onto obtained ionic liquids impregnated materials: batch studies - equilibrium, kinetic and thermodynamic studies. (2013, 2014);
4. Removal of various radionuclides from aqueous solutions through adsorption onto obtained ionic liquids impregnated materials: Column studies (2015);
5. The influence of competitive cations (eg. Na, K and Be) and the concomitant extraction of various radionuclides (2015, 2016);
6. Desorption of the radionuclides and recycle of ionic liquid impregnated material. Use of various cycle adsorption-desorption (2015; 2016)

Applicability and transferability of the results

The project topic is answering a well-defined problem/question with practical relevance – in the waters depollution with radionuclides content, opening and establishing the new science based on both adsorption technology and ionic liquids. The results may also be transferred to the students as part of their training in the field of water and waste water treatment, adsorption process and obtaining of new functionalized materials field.

Results

The use of ionic liquid impregnated materials as adsorbents in the removal process of radionuclides from aqueous solutions presented very good performance in the removal process of radionuclides from waste aqueous solutions because the adsorbent properties of the solid supports and the advantageous properties of ILs were combined. All results were validated by publication in scientific journals and presentation at scientific conferences: 6 articles published in ISI indexed journals, 5 articles published in BDI indexed journals, and 19 articles presented at international conferences, one patent application.

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Research Centre

Research Institute for Renewable Energy

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