

NEW MATERIALS CHEMICALLY MODIFIED USED FOR ARSENIC ADSORPTION FROM WATER

Goal of the project

The goal of the project is to obtain advanced materials functionalised with crown ethers which could be efficiently used in the removal process of arsenic from waters.

Short description of the project

In full accordance with the principle of sustainable development, the project presents a new concept for arsenic removal treatment of drinking water, using innovative systems involving new adsorbent materials. Why arsenic? Because arsenic is a national and worldwide problem. At the same time its toxicity is well known. Also, in the developing countries the underground waters represent the main source of drinkable water and their contamination with arsenic compounds is a problem that must be solved. There are many methods of arsenic removal from drinking water, like filtration, precipitation, coagulation, electrocoagulation, invers osmoses and ion exchange.

Adsorption is one of the most commonly method reported. Adsorption processes involving arsenic are considered to be rapid, depending on the material nature. Therefore, in order to reduce the negative impact of arsenic towards human health it is necessary to find some new materials for its removal.

For this reason, the project is focused on obtaining new materials for arsenic removal from drinking water, which have a good potential due to their low cost, eco-friendliness and low environmental impact.

Implementation period

21.11.2017 – 31.12.2018

Budget

46.500 RON (10000 EUR)

Main activities

The main objective of the project is to investigate an original approach, regarding

- (i) the obtaining of new materials chemically modified through functionalization with crown ethers and loaded with iron ions,
- (ii) use of these materials as adsorbent in the view of arsenic removal from waters and
- (iii) the reprocessing of these materials through refunctionalization.

The research presents an absolute novelty and has an exploratory character by obtaining of some new functionalized materials for arsenic removal, and through their reprocessing, after exhaustion bringing fundamental elements in the building of young research team, able for competition in the frame of European programmes.

Results

The results dissemination of the research are take in:

- 2 articles in ISI indexed journals;
- 2 articles in ISI-Proceedings;
- 6 papers are communicated and published in the specialty conferences volumes (Water Pollution XIV, 22-24 May 2018, Coruna, Spain; Polymers and Organic Chemistry 2018 (POC 2018) 4-7 June, Montpellier, France, 30.09-3.10. 2018, Bor Lake, Serbia, 11-12.10.2018, Timișoara, Romania)

Applicability and transferability of the results:

- Project could have a potential impact on Waters Utilities, Institutes of Public Health and Veterinary Health Directorates in the West Area.
- This project assumes an interdisciplinary approach which will elucidate the mechanism of arsenic removal from water through adsorption on chemically modified materials through functionalization with crown ethers and loaded with iron ions.
- Improved university-industry relationships.

Research team

Mihaela CIOPEC, Project Director
Narcis DUTEANU, Member
Iosif HULKA, Member
Ana-Maria PANA, Member

Contact information

Assist. Prof. Mihaela CIOPEC, PhD
Faculty of Industrial Chemistry and Environmental Engineering,
Department of Inorganic and Applied Chemistry and Environmental Engineering
Address: Blvd. V. Pârvan, No. 6, 300223, Timișoara
Phone: (+40) 256 404192
Mobile: 0722806880
E-mail: mihaela.ciopec@upt.ro