NEW MATERIALS USED FOR ARSENIC REMOVAL FROM WATER

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Abstract

Present habilitation thesis was structured in two different parts, and was prepared based on 31 research papers and one national patent. I am the leading author of 17 of these papers and the coauthor of 14. Of these papers, 18 are indexed in Clarivate Analytics, 12 are indexed in different other international databases, and one is a book chapter published by an international book publisher.

First part of habilitation thesis is briefly presenting my main professional, scientific, and academically achievements from the moment I defended my PhD thesis (2002) until now. During this period, I worked into the chemical engineering and in environmental protection areas. In this chapter are firstly presented the main aspects regarding the arsenic content into the worldwide natural waters as also in our country, natural and anthropic arsenic sources and the effects of his presence onto the human health, emphasizing all personal contributions. All these studies were focused on arsenic presence in West Romania ground waters, which represent a real problem. High risks associated with consumption of arsenic contaminated water made me identify new extraction materials and processes. New arsenic removal strategies emerged. Because current technology used for arsenic removal processes are quite expensive and generate too much waste and byproducts, we focused on obtaining, describing and testing new environmental friendly materials, technologies and methods. Clean technologies, such as the adsorption would recover or eliminate the arsenic from waters.

Exhausted inorganic materials due to arsenic removal were immobilized in vitreous matrix used to produce decorative glazes. Organic materials used for arsenic removal were regenerated and reused for several times. Based on experimental studies can conclude that all studied material present good adsorption properties, and can be used for arsenic retention from waters in dynamic or also in static regime. Adsorption process is better described by the pseudo-second order kinetic model, is spontaneous, endotherm, and has a physical or chemical nature. Also, it was revealed that the contact surface and also the presence of iron ions present a high importance into the arsenic adsorption on studied materials.

In second part of habilitation thesis are presented the further objectives regarding didactic career, research, and further development of academic career. Present habilitation thesis contains 306 references.

The full abstract at:
http://www.upt.ro/img/files/2016-2017/abilitare/negrea/Negrea_Adina_rezumat-engleza.pdf

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