

Aleksandra Daković, CV

In 1992 Aleksandra Daković graduate Physical Chemistry at the University of Belgrade, obtained master thesis in 1998, and PhD in 1992 at Faculty of Physical Chemistry, University of Belgrade. From 1994. she is employed in Institute for Technology of Nuclear and Other Mineral Raw Materials, in Belgrade, Serbia. Her current research position is principal research fellow.

In the Institute, Aleksandra Daković is dealing with the preparation, characterization and modifications (using inorganic or organic substances) of the natural mineral raw materials (zeolites, bentonites and clay minerals), in order to obtain materials for adsorption of mycotoxins, heavy metal cations, anions and/or drugs. She participate in studies on surfactant modified zeolites as carriers of pharmaceutically active ingredients. She was the Principal investigator of a national fundamental research project, two innovation projects and two bilateral projects between Serbia and Croatia funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

She was a guest researcher at College of Veterinary Medicine and at Animal Science Department, University of Missouri, Columbia, USA (several times), cooperation with Faculty of Chemistry and Technology, University of Split, University of Sannio, Benevento, Federico II University, Naples, University of Sassari, Sassari, etc. Aleksandra Daković was the President of the International Natural Zeolite Association (INZA) in a period 2014-2018, and member of International Zeolite Association (IZA), Serbian Zeolite Association (SZA) and Croatian Zeolite Association (CROZA).

She published around sixty papers in the refereed international journals (H index =18). She was a member of the Organizing Committee of a several Conferences and the Chair of the Organizing Committee of the 9th International Conference on the Occurrence, Properties and Utilization of Natural Zeolites (Belgrade, Serbia 2014).

Abstract

For adsorption of low polar molecules, modification of zeolites with long chain cations - surfactants has been used to alter their surface properties. The commonly used cationic surfactants are: hexadecyltrimethyl ammonium (HDTMA), octadecyldimethylbenzyl ammonium (ODMBA), benzalkonium (BC), cetylpyridinium (CP), benzyltetradecyl ammonium (BDTDA), etc. Surfactants are usually too long to enter into zeolite channels, thus they can replace only native inorganic cations at the external zeolitic surface (external cation exchange capacity of zeolite – ECEC). When amounts of surfactants are below or equal to ECEC of zeolite, their adsorption onto zeolitic surface usually includes ion exchange. When amounts of surfactants are greater than ECEC of zeolite, a bilayer forms and then their adsorption occurs through ion exchange and hydrophobic bonding. Surfactants at the zeolitic surfaces provide active sites relevant for adsorption of organic molecules.

This presentation describes modifications of the natural zeolites – clinoptilolite and phillipsite with different surfactants and their possible application as adsorbents of mycotoxins (low polar molecules – contaminants of animal feed), as carriers of pharmaceutical active ingredients (low polar molecules – anti-inflammatory drugs), as well as adsorbents for removal of some of emerging contaminants from water.