Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION

Serbian Ceramic Society
Institute of Technical Sciences of SASA

PROGRAM AND THE BOOK OF ABSTRACTS

Serbian Academy of Sciences and Arts, Knez Mihailova 35
May 10-11th, 2012, Belgrade, Serbia

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Organized by
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&
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Dear Colleagues and friends,

We have great pleasure to welcome you to the Advanced Ceramic and Application Conference organized by the Serbian Ceramic Society in cooperation with the Institute of Technical Sciences of SASA.

This conference brings together researchers from academia and industry to present the latest advances in synthesis and characterization in the field on new ceramic structures. Chosen conference topics open the new frontiers in designing of advanced ceramic materials, since they cover fundamental theoretical research, modeling and simulation, controlled nanostructured materials synthesis and optimization of the consolidation process, which all together should provide device miniaturization and better perspective in energy-materials-information integration process.

General conference topics include:

- Basic Ceramic Science
- Multifunctional Ceramics
- Nanostructural Ceramics
- Bio- and Opto- Ceramics
- Constructive and Eco- Ceramics
- Magnetic and Amorphous Materials
- Composite Materials, Catalysis and Electrocatalysis
- Artistic Ceramic and Design

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Prof. Dr. Vojislav Mitić, President
Serbian Ceramic Society
World Academy Ceramics' Member

P19

Organobentonites as Multifunctional Adsorbents of Organo/inorganic Aquatic Mixtures

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Partial substitution of naturally present cations in the interlayer region of bentonite clay with quaternary alkyl ammonium cations (QAACs) with 16 carbon atoms in one alkyl chain was performed. The amount of QAACs used for the modification corresponded to CEC value of ≤ 1.0. The aim was the synthesis of organobentonites (OBs) with multipurpose adsorption properties. These materials could be used for the treatment of complex and highly polluted wastewaters (e.g. from textile industry). The organo/inorganic mixtures used as adsorbates consisted of: i) three textile azo dyes (Acid Yellow 99 – AY99, Acid Orange 10 – AO10 and Reactive Black 5 – RB5); ii) three heavy metals cations (Pb^{2+}, Cd^{2+} and Ni^{2+}); iii) selected textile dyes and heavy metal cations (AY99, AO10, RB5, Pb^{2+}, Cd^{2+} and Ni^{2+}). The initial concentration of each pollutant was 50 mg dm^{-3}. Dye concentration monitoring was performed by UV-VIS spectroscopy, while metal cations concentrations were estimated using ICP-OES. The study confirmed the feasibility of using partially substituted OBs as adsorbents for the simultaneous adsorption of organic and inorganic pollutants from aqueous solutions.

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P20

p-Nitrophenol Electro-oxidation on BTMA- bentonite Modified Electrode

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A glassy carbon electrode (GCE) was modified with thin layer of Na-enriched bentonite and a series of benzyltrimethylammonium (BTMA)- bentonites with different BTMA/bentonite ratios. The aim was to investigate electrochemical behavior of synthesized BTMA-bentonites and to correlate it with the textural properties. The organo-bentonites were characterized using X-ray diffraction, Fourier transform infrared spectroscopy and nitrogen adsorption-desorption method. Monolayer arrangement of BTMA in the interlayer space of smectite was confirmed. A deterioration of textural properties was observed with the increase of BTMA loading. The cyclic voltammetry was used for the investigation of electro–oxidation of *p*-nitrophenol (*p*-NP) in acidic medium on BTMA–B modified GCE. The electrochemical activity of BTMA-B based electrodes increased with BTMA loading. It can be assumed that the increased electrode activity toward *p*–NP was achieved due to the adsorption of *p*–NP on the electrode surface, since the adsorption commonly precedes the electro-oxidation process.