



Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION IX
New Frontiers in Multifunctional Material Science and Processing

Serbian Ceramic Society
Institute of Technical Sciences of SASA
Institute for Testing of Materials
Institute of Chemistry Technology and Metallurgy
Institute for Technology of Nuclear and Other Raw Mineral Materials

PROGRAM AND THE BOOK OF ABSTRACTS

Serbian Academy of Sciences and Arts, Knez Mihailova 35
Serbia, Belgrade, 20-21. September 2021.

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P

Insights into the effect of aluminum oxyhydrates properties on their electrochemical behavior

T. Novaković, B. Milovanović, S. Pavlović, P. Banković, Z. Mojović

University of Belgrade, Institute of Chemistry, Technology and Metallurgy,
Njegoševa 12, 11000 Belgrade, Serbia

Alumina oxyhydrates have different structural and textural properties, as well as different density of surface functional groups. Three alumina oxyhydrates with different water content, 3mol H₂O/ mol Al₂O₃ (gibbsite), 1mol H₂O/ mol Al₂O₃ (boehmite) and 0.6 mol H₂O/ mol Al₂O₃ (α,γ -alumina phase), were used in this study. The samples were used as modifiers of carbon paste electrode. Their electrochemical behavior toward ferricyanide/ferrocyanide redox probe was evaluated by electrochemical impedance spectroscopy and cyclic voltammetry. Ferricyanide/ferrocyanide redox system has a well-known electrochemical behavior and is sensitive to the changes occurring at the electrode surface. The lowest charge transfer resistance was obtained for α,γ -alumina phase. The redox process of ferri/ferro redox probe on investigated electrodes exhibited a quasi-reversible behavior, since the obtained values of peak-to-peak separation are greater than 59 mV value expected for a reversible process. The response toward quinone/hydroquinone redox probe was evaluated by cyclic voltammetry in buffered solutions at various pH. Gibbsite and boehmite showed expected response, while the surface groups of α,γ -alumina phase enabled quinone oxidation to proceed through two pathways simultaneously. The surface chemistry of investigated samples influenced their electrochemical properties.

P

Characterization of Tamnava clay by X-ray powder diffraction method

A. Radosavljević-Mihajlović¹, A. Saponjić², V. Kasić¹, V. Mitić³

¹Institute for technology of nuclear and other mineral raw materials, Franska D'Epere 86,
11000 Belgrade, Serbia

²Department of physical chemistry, "VINCA" Institute of Nuclear Science-National Institute
of the Republic of Serbia, University of Belgrade, Serbia

³ University of Nis, Faculty of Electronic Engineering, Nis, Serbia.

The X-ray powder diffraction method on a polycrystalline sample is one of the basic methods used in the characterization of aluminosilicate minerals. The clay minerals represent a complex system, in which more than one phase is present. The main problems in analysis of clay minerals is weak crystallinity, preferential orientation, as well as the appearance of asymmetry. In this paper are presented the results of analysis of smectic type clay from Tamnava area. For investigation was used the method of X-ray powder diffraction and SEM analysis.