



**Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION V
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
School of Electrical Engineering and Computer Science of Applied Studies**

PROGRAM AND THE BOOK OF ABSTRACTS

**Serbian Academy of Sciences and Arts, Knez Mihailova 35
Serbia, Belgrade, 21st-23rd September 2016.**

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ramic materials for the degradation of CWA and their simulants. Sulfur mustard (IUPAC name bis(2-chloroethyl) sulfide, military code HD), vesicant used in the development of the first chemotherapy drug mustine (IUPAC name bis(2-chloroethyl)methylamine) and 2-CEES (2-chloroethyl methyl sulfide), a simulant for HD, were analyzed. Comparative analysis has been performed for MgO, Al₂O₃, TiO₂ and SiO₂. Results imply that the use of nanostructured materials is favorable for good decontamination efficiency.

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Solvothermal synthesis of zinc-copper-ferrite nanoparticles

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Spinel ferrites nanoparticles have been attracting considerable attention due to their potential for application in a variety of fields that include data storage, catalysis, energy, environment, and in particular, biomedicine. However, for each application the magnetic nanoparticles with specific size, shape and magnetic response are required. Therefore, fine tuning of the particle size, shape and crystallinity is essential for production of magnetic nanoparticles capable to meet application-specific requirements.

In the present work, physicochemical properties of Zn_{1-x}Cu_xFe₂O₄ nanoparticles (x = 0; 0.2; 0.4; 0.6; 0.8; 1.0) were investigated. In order to obtain particles uniform in size and shape, the solvothermal synthesis method and oleic acid, acting as a capping agent, were used. The obtained powders were characterized by X-ray powder diffraction (XRD), transmission electron microscope (TEM), Fourier transform infrared spectroscopy (FT-IR) and vibrating sample magnetometer (VSM). The XRD results show that all diffraction maxima correspond to the cubic spinel structure, indicating the high purity of samples, while the TEM analysis showed sphere-like particles, 5-7 nm in size. The presence of oleic acid on the surface of magnetic nanoparticles was confirmed by FT-IR analysis. VSM measurements revealed superparamagnetic behavior of the magnetic nanoparticles.

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QUANTITATIVE METALLOGRAPHY MODERN METHODS

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This paper has been concerned with the classical Stereological targets V, S, L, and N only, namely with so-called first-order properties. Stereology is now drifting rapidly toward second-order methods, aimed at quantifying spatial pattern for the elements of a structure (e.g. clustering, repulsion, etc., between the elements) as well as the nature and degree of association

between different structures. Second-order statistical methods are widely available for point patterns. Important devices for the second-order analysis of cells and organelles when regarded as points in space have recently been devised. Analogous methods extend to higherdimensional quantities such as surface areas and volumes.

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Changes of High Purity $\text{Bi}_{12}\text{GeO}_{20}$ Single Crystal Properties Induced by Femtosecond Pulsed Laser Irradiation

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It had been shown that a femtosecond pulsed laser irradiation can improve optical properties of $\text{Bi}_{12}\text{GeO}_{20}$ single crystals. We investigate if the effect occurs if the crystals are grown from high purity components. The samples were irradiated by a femtosecond pulsed laser beam of increasing power. After irradiation, intensity of Raman spectra peaks increased, except for the peak at 203 cm^{-1} , whose intensity decreased. The irradiation also changed the sample color. The induced changes were less intense than was the case when the crystal was grown from components of lesser purity.

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MATERIAL CHARACTERIZATION SEM MODERN METODS

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Detailed analysis was carried out and systematization of methods used in the characterization of materials using SEM. We analyzed its operation. Attention was paid to its major parts. Specially to the electron gun and lens. Also, comparisons of forming character oprickim microscope and SEM. In further analysis we have studied differences between EDS and WDS.. The EDS features measurement with a small probe current, short-time acquisition of spectra, etc. WDS features a high energy (wavelength) resolution, detection of trace elements. Most SEMs are equipped with an EDS, whereas a WDS is generally used as an Electron Probe Microanalyzer (EPMA) that mainly performs elemental analysis.