

MATERIALS RESEARCH SOCIETY OF SERBIA
INSTITUTE OF TECHNICAL SCIENCES OF SASA

Programme and the Book of Abstracts

**SEVENTEENTH YOUNG RESEARCHERS' CONFERENCE
MATERIALS SCIENCE AND ENGINEERING**

Belgrade, December 5–7, 2018

Materials Research Society of Serbia

<http://www.mrs-serbia.org.rs/index.php/young-researchers-conference>

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**Materials Research Society of Serbia
&
Institute of Technical Sciences of SASA**

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Aim of the Conference

Main aim of the conference is to enable young researchers (post-graduate, master or doctoral student, or a PhD holder younger than 35) working in the field of materials science and engineering, to meet their colleagues and exchange experiences about their research.

Topics

Biomaterials
Environmental science
Materials for high-technology applications
Nanostructured materials
New synthesis and processing methods
Theoretical modelling of materials

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Results of the Conference

Beside printed «Program and the Book of Abstracts», which is disseminated to all conference participants, selected and awarded peer-reviewed papers will be published in journal “Tehnika – Novi Materijali”. The best presented papers, suggested by Session Chairpersons and selected by Awards Committee, will be proclaimed at the Closing Ceremony. Part of the award is free-of-charge conference fee at YUCOMAT 2019.

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**The consolidation process and microstructure analysis
of synthesized diamonds within fractal nature analysis**

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The development of new technologies is very often based on improvement of novel materials and the features of the existing ones as well as their application. Considering that the synthetic diamonds are one of the most appealing areas of modern materials science and its modern applications, the research in this area is becoming more intensive. Therefore, in this paper, an overview of the basic properties of natural and synthesized diamonds is firstly presented followed by the method of forming and parameters that affect the final properties of polycrystalline diamonds. The first method which was used for obtaining synthesized diamonds was HPHT (high pressure high temperature) method, by which were produced diamonds very similar to the natural ones. However, CVD (chemical vapor deposition) method for obtaining polycrystalline diamond films was more promising. By applying this method microcrystalline diamond (MCD) with grain size larger than 100 nm were created. Considering that there were some disadvantages of MCD, new nanocrystalline (NCD) and ultra-nanocrystalline (UNCD) diamond materials were developed, which average size of grains were 5-100 nm as well as 3-5 nm. Depending on the consolidation process (composition and pressure of applied gases, filament setup and reactor geometry) the properties of polycrystalline diamonds can vary. Detailed analysis of these materials nature can be additionally obtained by application of the fractal analysis which is presented in this paper.