

**TWENTY-SECOND YOUNG RESEARCHERS'  
CONFERENCE  
MATERIALS SCIENCE AND ENGINEERING**

**December 4 – 6, 2024, Belgrade, Serbia**

**Program and the Book of Abstracts**

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

2024

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Program and the Book of Abstracts

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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  
Materials for new generation solar cells  
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 2025.

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### **Advancements in Intraocular Lenses Design and Manufacturing: Evaluating Optical Clarity and Performance Standards**

Ana Mirić<sup>1</sup>, Nevena Milivojević Dimitrijević<sup>1</sup>, Strahinja Milenković<sup>1</sup>, Dalibor Nikolić<sup>1</sup>, Vukašin Slavković<sup>2</sup>, Nenad Grujović<sup>2</sup>, Marko Živanović<sup>1,3</sup>, Nenad Filipović<sup>2,3</sup>

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Cataract is the most common cause of blindness in the world. It manifests as clouding of the crystalline lens, which occurs as a result of the disruption of biochemical processes during aging. The only effective treatment for cataracts is surgical intervention. Although it is a routine operation, complications are possible. During surgery, the crystalline lens can be damaged, and it can be replaced with an implant, an intraocular lens (IOL). The main role of the IOL is to establish optical focus. An ideal intraocular lens provides the patient with good vision for a long period of time. Today, IOLs generally contain a chromophore that blocks UV light to prevent retinal damage and damage from increased oxidative stress. We designed our lens in SolidWorks® Premium 2022 SP0.0 CAD software. It is designed as a one-piece, biconcave lens, with two components: optics and haptics. In the software Chitubox V1.7.0, the preparation for printing the mold was done. The mold was printed on a Creality LD-006 3D printer, using the mask stereolithography (mSLA) technique. Photopolymer in the form of resin used for printing is Creality resin LCD Dental Cast. We used polydimethylsiloxane (PDMS) to make the IOL. PDMS has good optical properties because it shows high resistance to exposure to sunlight, it is stable and biocompatible, which gives it the possibility of application in biomedicine. The pre-polymer and the cross-linking agent were mixed, after which it was poured into the mold. The cast lens was left in the oven, at an elevated temperature, to harden. Optical transmittance intensity was determined using Multiskan SkyHigh UV/VIS. Absorbance was measured at a certain wavelength. Our lens showed low optical transmittance for UV light. In the visible spectrum, the lens showed a significant increase in transmission, while there were no changes at wavelengths above the visible spectrum.