



# PHYSICAL CHEMISTRY 2022

16<sup>th</sup> International Conference  
on Fundamental and Applied Aspects of  
Physical Chemistry

Organized by  
The Society of Physical Chemists of Serbia

# BOOK OF ABSTRACTS



*Online Event*  
**September 26-30, 2022**  
**Belgrade, Serbia**

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*Abbreviations*

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- PL** – Plenary Lecture
- SL** – Section Lecture
- O** – Oral Presentation
- P** – Poster Presentation

**Topics**

- A** – Education and History
- B** – Spectroscopy, Molecular Structure, Physical Chemistry of Plasma
- C** – Kinetics, Catalysis
- D** – Nonlinear Dynamics, Oscillatory Reactions, Chaos
- E** – Electrochemistry
- F** – Biophysical Chemistry, EPR investigations of Bio-systems
- G** – Organic Physical Chemistry
- H** – Material Science
- I** – Photochemistry, Radiation Chemistry, Photonics
- J** – Macromolecular Physical Chemistry
- K** – Environmental Protection, Forensic Sciences, Geophysical Chemistry,  
Radiochemistry, Nuclear Chemistry
- L** – Phase Boundaries, Colloids, Liquid Crystals, Surface-Active Substances
- M** – Complex Compounds
- N** – Food Physical Chemistry
- O** – Pharmaceutical Physical Chemistry

**B-05-P**

## **APPLICATION OF LIBS TECHNIQUE FOR DENTAL ANALYSIS**

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### **ABSTRACT**

This paper evaluates the possibilities of the original LIBS (Laser Induced Breakdown Spectroscopes) laboratory setup for the elementary analysis of human tooth tissues and tooth restorations. For that reason, samples of the teeth restored with amalgam and composite fillings were analyzed. In addition, the possibility of heavy metal diffusion from restoring materials into healthy tooth tissues was also examined. Plasma was induced by the TEA CO<sub>2</sub> laser in the air under atmospheric pressure. Optical emission spectra with sharp and well-decomposed spectral lines and a negligibly low background were obtained. The results of the elemental analysis showed the presence of various trace elements in the tooth tissues (P, Ca, Mg) as well as within restorations such as Zn, Cu, Ag, Hg. The analysis also showed that cement successfully blocked diffusion from restoring materials (amalgam and composite) into the dentine below. Obtained preliminary results led to the conclusion that this alternative and cost-effective LIBS system can find application as a useful tool for further research on laser-induced plasma in dentistry.