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## XXII MENDELEEV CONGRESS ON GENERAL AND APPLIED CHEMISTRY

Dedicated to the 190<sup>th</sup> anniversary of D.I. Mendeleev and the 300<sup>th</sup> anniversary of the Russian Academy of Sciences

### **BOOK OF ABSTRACTS**

#### Volume 5

Book of abstracts in 7 volumes

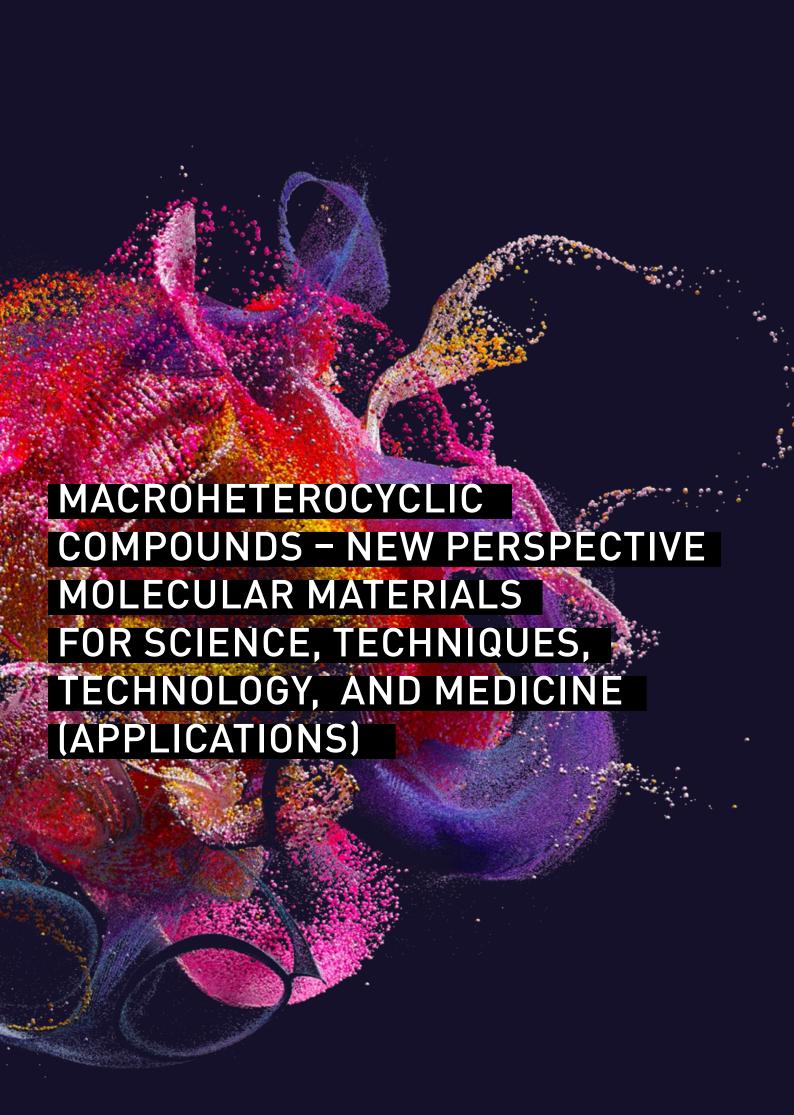
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For a wide range of electrochemists, chemists, physicists, ecologists, engineers, specialists of research groups, organizations, postgraduates and students.





#### PHOTOCATALYTIC REAGENTLESS SENSOR SURFACE BASED ON PHTHALOCYANINES AND PLASMONIC STRUCTURES

Afonyushkina E.Yu., a Shiryaeva O.A., a, b Zvyagina A.I., Kapitanova O.O., Veselova I.A., Kalinina M.A.

<sup>a</sup> Lomonosov Moscow State University, 119991, Moscow, Leninskie Gory, 1, bld. 3
e-mail: afonyushkina@yandex.ru
<sup>b</sup> A.N. Frumkin institute of physical chemistry and electrochemistry of the Russian Academy of Sciences, 119071, Moscow, Leninsky prospect, 31, bld. 4

One of the promising directions of modern bioanalytical chemistry is the development of reagentless optical sensor elements (no reagents need to be added externally except for analytes) based on enzymes or their mimetics for the determination of a wide range of biologically active substances.

Sensor systems and methods to increase the rapidity of analysis, its accuracy, sensitivity, while ensuring its simplicity are being actively sought.

Surface-enhanced Raman spectroscopy is one of the promising methods for solving these problems. This method allows to identify analytes in complex matrices with high sensitivity (at the level of single molecules) without preliminary sample preparation.

In this case, to expand the possibilities of SERS, the capability to detect compounds whose bond vibrations don't appear or have a low intensity in the Raman spectrum is of particular interest at present. Examples of such compounds are classical indicator molecules in biocatalytic sensor systems based on oxidoreductases such as o-phenylenediamine (o-PDA) and 3,3',5,5'-tetramethylbenzidine (TMB).

In the present work, we have developed an ultrathin reagentless photocatalytic SERS-sensor system based on the sodium salt of zinc octa (3',5'-dicarboxyphenoxy) phthalocyaninate, which was immobilized on a graphene oxide modified surface, and silver nanoparticles. The photocatalytic activity of zinc phthalocyaninate in reactions of oxidation of o-PDA and TMB under visible light and the possibility of detection of oxidized forms of these biocatalytic indicators by SERS method were demonstrated.

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#### Scientific edition

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