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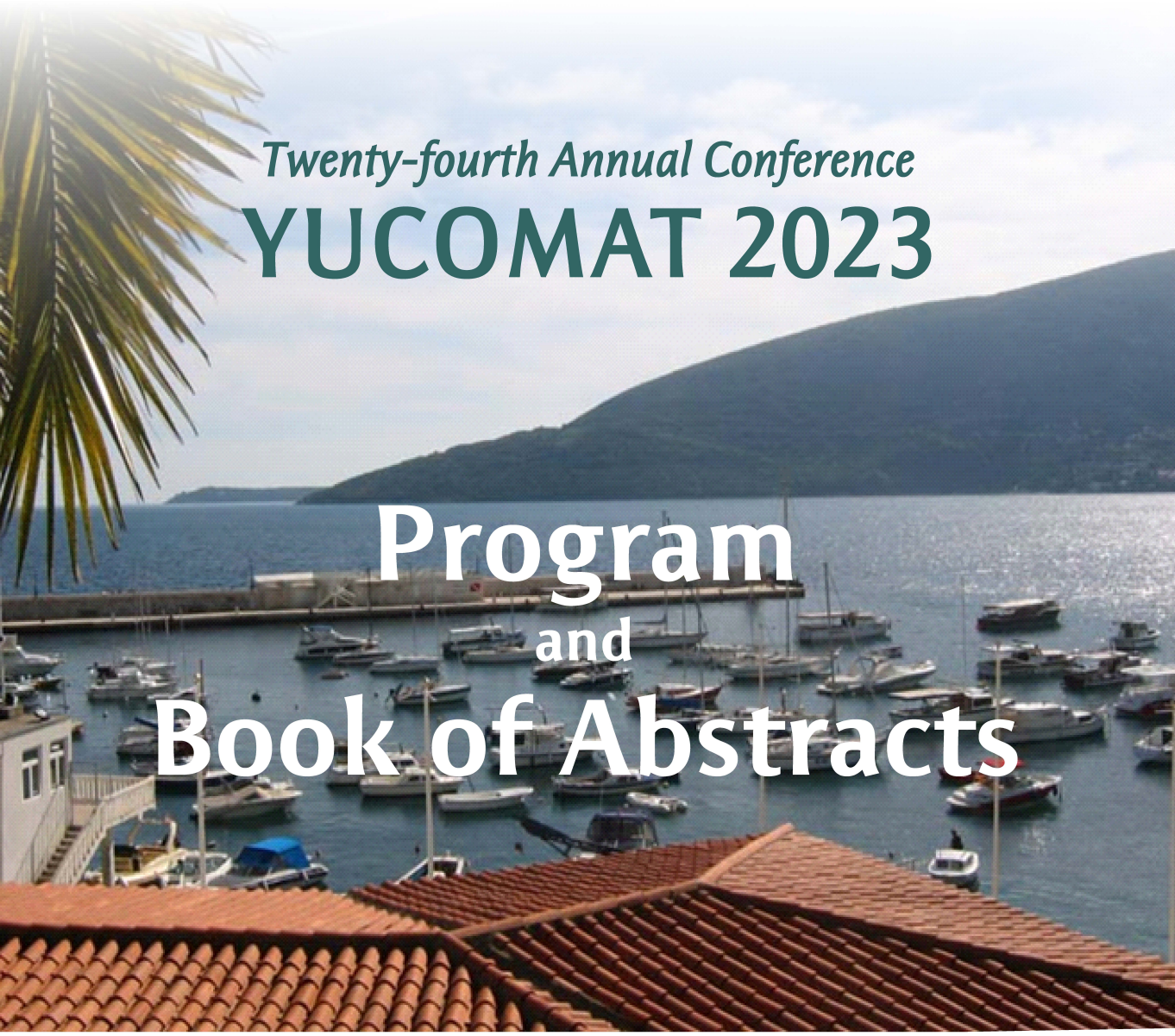

Twenty-fourth Annual Conference

YUCOMAT 2023

Program and Book of Abstracts

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FEDERATION OF EUROPEAN MATERIALS SOCIETIES

Materials Research Society of Serbia

24 conference

SERBIA MRS

YUCOMAT 2023

Herceg Novi, Montenegro :: September 4-8, 2023

TWENTY-FOURTH ANNUAL CONFERENCE

YUCOMAT 2023

Hunguest Hotel Sun Resort, Herceg Novi, Montenegro
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O.S.9.

Ion-beam irradiated graphene oxide, 12-tungstophosphoric acid and their nanocomposites for electrochemical supercapacitors

Željko Mravik[1], Milica Pejčić[1], Jelena Rmuš Mravik[1], Blaž Belec[2], Danica Bajuk-Bogdanović[3], Sonja Jovanović[1], Smilja Marković[4], Nemanja Gavrilov[3], Vladimir Skuratov[5], Zoran Jovanović[1]

[1]Center of Excellence for Hydrogen and Renewable Energy (CONVINCE), Laboratory of Physics, Vinča Institute of Nuclear Sciences, – National Institute of the Republic of SerbiaUniversity of Belgrade, Belgrade, Serbia, [2]Materials Research Laboratory, University of Nova Gorica, Ajdovščina, Slovenia, [3]Faculty of Physical Chemistry, University of Belgrade, Belgrade, Serbia, [4]Institute of Technical Sciences of SASA, Belgrade, Serbia, [5]Flerov Laboratory of Nuclear Reactions, Joint Institute for Nuclear Research, Dubna, Moscow region, Russia

Ion beam modification of materials is notable method for achieving their unique structural, electronic, and other physicochemical properties. In the case of graphene oxide (GO) such modification of structure and surface chemistry is known to yield properties interesting for electrochemical supercapacitors. The performance of GO supercapacitors can be additionally improved by incorporating components with attractive redox properties. In this work, the influence of ion beam irradiation on synergy of GO and 12-tungstophosphoric acid (WPA) in their nanocomposite was investigated. For that, both components and their composites with different mass ratios were irradiated using different ion species, fluences and energies (from 10 keV C to 710 MeV Bi). For the irradiated WPA, results showed clear correlation between ion beam parameters, degree of structural modification and electrochemical properties. With increasing structural modification, bond breaking is first induced giving higher catalytic activity toward HER. Further irradiation resulted in an increased interconnection of polytungstate species producing lower catalytic activity and lower lithiation capacity. Irradiated GO showed modified surface chemistry, with preferable reduction of alkoxy and epoxy groups, changes in morphology and electric properties due to increased number of defects with increasing fluence**,** synergic effect of ion beam irradiated GO and WPA resulted in higher capacitance of irradiated composites compared to GO presumably because of interaction of structurally modified WPA with defect sites on GO thus reducing electrolyte flow along ion tracks.