Programme & The Book of Abstracts

Twenty-first Annual Conference

YUCOMAT 2019

&

Eleventh World Round Table Conference on Sintering – Science of Sintering & Its Future: Fifty Years Later

WRTCS 2019

Herceg Novi, Montenegro September 2 - 6, 2019

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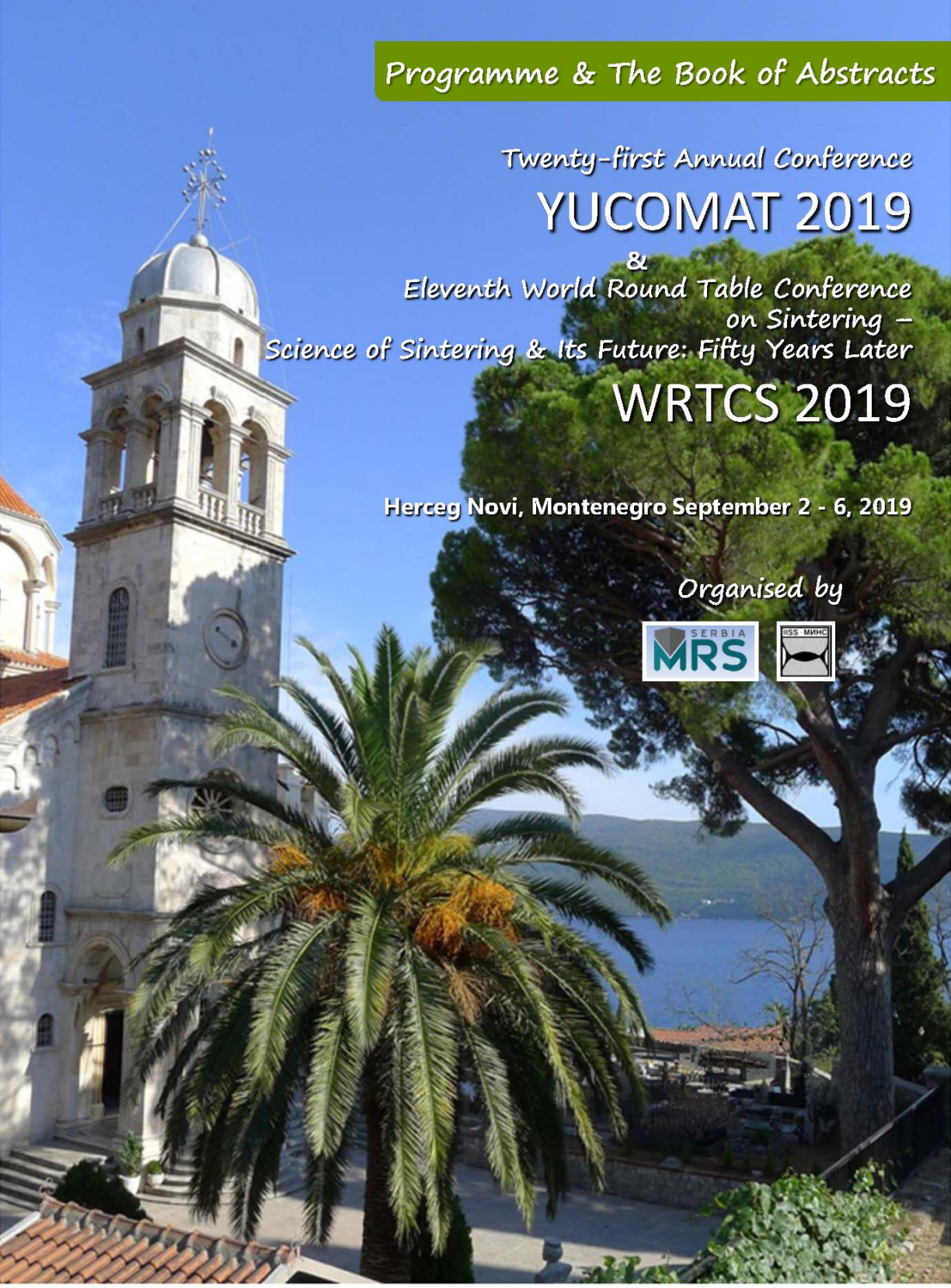

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Y.O.S.II.1.

The structure and electrochemical properties of fayalite Fe_2SiO_4

Dragana Jugović[1], Miodrag Mitrić[2], Miloš Milović[1], Valentin N. Ivanovski[2], Srečo D. Škapin[3], Dragan P. Uskoković[1]
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Fayalite has been found various applications in many fields. Here is presented its use as anode material for lithium ion batteries. The syntheses of Fe_2SiO_4 and its composite with carbon are conducted through solid-state reaction at 850 °C under inert atmosphere of argon, using cheap and abundant precursors ($Fe(NO_3)_3 \times 9H_2O$ and amorphous silica). Citric acid served as carbon source. The phase-purity of synthesized powders is checked by X-ray powder diffraction. The crystal structure of the powders is refined in orthorhombic Pbnm space group. Half-cell configuration, with lithium metal as counter electrode and fayalite as working electrode, is used for electrochemical measurements: galvanostatic cycling and electrochemical impedance spectroscopy.

Y.O.S.II.2.

Fabrication of graphene/Cu flexible electrode with excellent mechanical reliability and electrical performance

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Flexible electrode is an indispensable component of emerging portable, flexible and wearable electronic devices. Although various flexible electrodes with different dimensions and functions have been explored, developing a new electrode material with excellent mechanical reliability and superior electrical performance remains challenge. In this talk, we present a new graphene-covered Cu composite electrode film with a total thickness of ~100 nm, which was successfully fabricated onto a flexible polyimide substrate by means of a series of assembly methods including physical vapor deposition, chemical vapor deposition and transfer technique. The composite electrode film on the flexible substrate exhibits evidently enhanced tensile strength, monotonic bending and repeatedly bending fatigue reliability as well as electrical performance compared with that of the bared Cu electrode film. Such excellent mechanical performances were attributed to the role of the graphene coating in suppressing fatigue damage formation and preventing crack advance. It is expected that the synthesized graphene-covered Cu composite electrode would extend the potential ultrathin metal film electrode as the innovative electrode material for next-generation flexible electronic devices.

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