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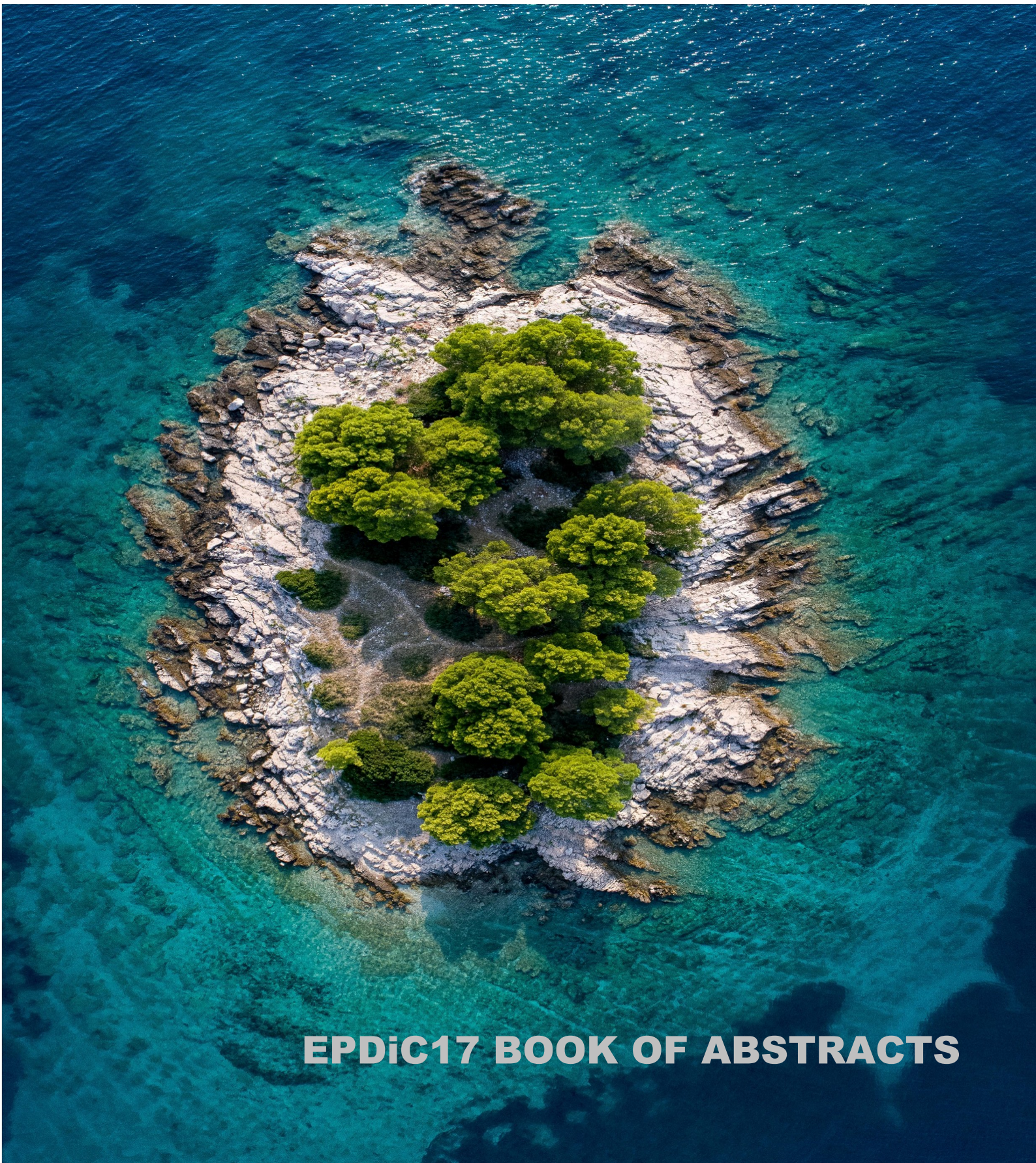

EPDiC17 BOOK OF ABSTRACTS

MS5-P15

Photocatalytic and antimicrobial effects of zinc oxide nanoparticles prepared by thermal decomposition of zinc benzenepolycarboxylato complexes

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Zinc oxide nanoparticles (ZnO-NPs) have been a subject of numerous researches owing to their multifunctional properties in many applications, such as solar cells, UV light-emitting devices, gas sensors and photocatalysts. ZnO-NPs can be synthesized through various methods and their features can be tailored by shape and size, resulting in new applications relevant to their structural properties.

The synthesis of ZnO-NPs *via* controlled thermal decomposition of the single-source precursors represents a novel synthetic methodology. The basic goal of this study was to investigate the influence of precursors on crystallite size and morphology of the resulting ZnO-NPs. Four structurally characterized Zn complexes with different benzenepolycarboxylato ligands [1] were used as precursors for investigation of photocatalytic and antimicrobial effects of thermally obtained ZnO-NPs.

The XRPD and FESEM analysis of ZnO-NPs, prepared by thermolysis of Zn precursors at 450 °C in the air atmosphere, revealed hexagonal wurtzite structure (space group $P6_3mc$, $a \approx 3.25$ and $c \approx 5.21$ Å) with an average crystallite size in the range of 39–47 nm and similar morphology. The best photocatalytic activity for degradation of *Reactive orange 16* dye has been observed for ZnO-NPs where crystallites form the smallest agglomerates. All obtained ZnO-NPs showed excellent inhibitory effect against Gram-positive bacteria *Staphylococcus aureus* and Gram-negative bacteria *Escherichia coli*.

[1] L. Radovanović, J. Rogan, D. Poleti, M. Milutinović, M.V. Rodić, *Polyhedron* **112** (2016) 18.