

XXI B-MRS Meeting



XXI B-MRS Meeting

October 1st to 5th



BRAZILIAN MATERIA
RESEARCH SOCIETY

Maceió-AL, Brazil

October 1st to 5th, 2023

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Welcome

The **Brazilian Materials Research Society (B-MRS)** and the **Committee of the XXI B-MRS Meeting** invite the worldwide community of materials research to attend the 2023 Meeting to be held at the Ruth Cardoso Cultural and Exhibition Center in **Maceió-Alagoas, Brazil, October 1st to 5th, 2023**.

This traditional forum is dedicated to recent advances and perspectives in materials science and related technologies. It will be an excellent opportunity to bring together scientists, engineers and students from academy and industry to discuss the state of the art of Materials Science discoveries and perspectives.

Maceió is one of the main Brazilian capitals that has received many tourists mainly due to the receptivity of its inhabitants, the beautiful beaches with warm waters and extraordinary gastronomy. You will be very well welcome to Maceió. Do not miss this opportunity.

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Hybrid urethane films based on PDMS and OGPOSS: Synthesis via CO₂ fixation and evaluation of its antimicrobial activity.

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In this study, we have developed potential antimicrobial polymeric films for possible applications as antimicrobial metal coatings. The precursors were prepared by the reaction between carbon dioxide and polyepoxides, in order to obtain cyclic bis- and octa-carbonate (CC's). Thus, these CC's were reacted by aminolysis with isophorenediamine and an aminopropytriethoxysilane, leading to the formation of non-isocyanate (poly)urethanes (NIPU's) derived from poly(dimethylsiloxane) (PDMS) and octaglycidyl dimethylsilyl polyhedral oligomeric silsesquioxane (OGPOSS). Finally, self-supported hybrid films of these NIPU's were obtained through the sol-gel process, catalyzed by phosphotungstic (PWA) or phosphoric (H₃PO₄) acid. The precursor CC's and the hybrid films were characterized by the techniques of Energy Dispersive X-ray Fluorescence Spectroscopy (EDXRF), Fourier Transform Mid-Infrared Absorption Spectroscopy (FTIR), Raman Spectroscopy and Nuclear Magnetic Resonance (NMR). In addition, the films were preliminarily tested for bactericidal activity for *Staphylococcus aureus*. The acid incorporation into the urethanes improved the antimicrobial activity from bacteriostatic to bactericidal. Higher concentrations of CCOGPOSS also implied an improvement in antimicrobial activity.

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