XXI B-MRS Meeting

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October 1st to 5th

SBPMat B-MRS BRAZILIAN MATERIA RESEARCH SOCIET

Maceió-AL, Braz

October 1st to 5th, 2023

Booklet | Presentation Schedule | Mobile App

until ~~April 17th~~ May 1st	~~June 00th~~ June 25th	until ~~June 19th~~ June 29nd	~~June 26th~~ July 07th	until July 26th
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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 Meetir
be held at the Ruth Cardoso Cultural and Exhibition Center
Maceió-Alagoas, Brazil, October 1st to 5th, 2023.

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

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

Organizing Committe

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Polyacrylonitrile/nanocellulose composite electrospun membranes for use as active filter layers: evaluation of the influence of castor oil as a compatibilizing agent

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Castor oil (CO) was added at a concentration of 2.5 wt% in the composition of composite electrospun membranes containing polyacrylonitrile (PAN) and 15 wt% of cellulose nanocrystals (CNCs) or 0.4 wt% of cellulose nanofibrils (CNF). The action of CO as a compatibilizing agent between the hydrophobic matrix of PAN and the hydrophilic reinforcement of nanocellulose was evaluated. In most membranes, CO combined with CNCs or CNF led to more heterogeneous fibers with broader fiber diameter distributions than the neat PAN membrane. This can be attributed to incorporating CO/nanocellulose into part of the fibers. The thermal stability of the membranes was not significantly affected by the presence of CO/nanocellulose in their compositions, as well as their glass transition temperature (Tg, approximately 113 ºC). CO effectively acted as a compatibilizing agent between the matrix and the reinforcing agent in the composite membranes, as indicated by an increase of (i) up to four times in the storage modulus of membranes containing CO/nanocellulose; (ii) up to four times in the ultimate tensile strength, and approximately five times in the elastic modulus, compared to the neat PAN membrane. Notably, the presence of CO/nanocellulose in the composition of the membranes raised their air permeability, with an increase in the Darcian permeability coefficient (k1) of approximately three times, compared to neat PAN. This is an ongoing study, and the aerosol filtration properties of PAN membranes containing CO/nanocellulose, focusing on their application as active layers of respirators and medical masks, are in progress. Acknowledgements: FAPESP, State of São Paulo Research Foundation, Brazil (Process No. 2019/20626-8 and 2017/19549-3, fellowship to R.P.O.S.).