

XXI B-MRS Meeting

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B-MRS
Meeting
October 1st to 5th



BRAZILIAN MATERIA
RESEARCH SOCIET

Maceió-AL, Bra

October 1st to 5th, 2023

Booklet

Presentation
Schedule

Mobile
App

until April 17 th May 1 st Submission of Abstracts	June 06 th June 25 th Abstract status notification	until June 19 th June 29 nd Submission of Revised Abstract	June 26 th July 07 th Final Abstract Notificatio n	until July 26 th Submission for Student Awards
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Before the conference: the file (in pdf format) should be sent by email until September, 28th to - sinalizacaoconexao@gmail.com

Amount R\$ 70.00 - payment via PIX. The poster will be available at the Poster Help Desk at the Conference on Monday morning, October 2nd - 9am.

Request for resources from FAPESP

Researchers from the State of São Paulo (BR) might be eligible for financial support from FAPESP. More information in the link below.

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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 beaches with warm waters and extraordinary gastronomy. We very well welcome to Maceió. Do not miss this opportunity.

Organizing Committee



Carlos Jacinto da Silva
Chair

Institute of Physics,
Universidade Federal de Alagoas



Mário Roberto Meneghetti
Chair

Institute of Chemistry and
Biotechnology, Universidade
Federal de Alagoas

Densification of starch compound for direct dosing in thermoplastic starch extrusion process

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Thermoplastic starch (TPS) is a promising biodegradable material. With the increasing development of TPS materials at an industrial level and from a technological point of view, there is a need to focus on improving the industrial processing system to make the most of its potential. A common previous mixture of starch and a plasticizer is prepared to obtain TPS which is called *pre-mixture* (PM). However, focus on the fine particulates of the starchy inputs, the use of PM presents a significant challenge due to its powder form which hinders the fluidity in hoppers. That approach is still an issue that requires investigation. In this work, densified compounds (DC) of starch and glycerol were produced to be directly used in the TPS extrusion process, as a fluidized alternative. Thus, different types of DC such as tablets, agglomerates and pellets were obtained. They were produced by direct dry compaction, wet agglomeration and agglomeration with a binder (gelatinized starch paste), respectively. The DC obtained were submitted to the extrusion process to obtain TPS. The DC were evaluated by dosing in a conventional extrusion hopper and characterized in terms of particle size distribution, structural analysis by SEM and thermal analysis by TGA. The TPS films, produced using both PM and DC, were also characterized through tensile tests, DRX and thermal analysis. The qualitative evaluation of tablets DC type aimed only to guarantee its formation and stability. The shape and conformation of the agglomerates were found to be dependent on the glycerol content and moisture level. Gelatinized starch proved to be effective to allow the formation of pellets. The use of densified starch feedstock resolved feeding issues in the extruder hopper. A complete breakdown of the starch granules was achieved when DC were used after extrusion. Mechanical properties showed inferior performance when compared with TPS samples using PM inputs.

Acknowledgments:

This work was supported by CAPES.