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CENTER FOR ADVANCED NEW MATERIALS, ENGINEERING, AND EMERGING TECHNOLOGIES

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Prof. Sivanesan Subramanian
Prof. Hassan Karimi-Maleh
Editors-in-Chief
Applied Chemical Engineering
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Dear Professor Subramanian and Professor Karimi-Maleh,

I am submitting a manuscript titled “Preparation of bioplastic from chitosan and mango (*Mangifera Indica L. Anacardiaceae*) by Adrian Seth Amaba, Kristine Claire Villanueva, Noel Peter Tan*, Francis Dave Siacor, and Maria Kristina Paler for publication as a research article in Applied Chemical Engineering (ACE).

Chitosan and starch are two of the most abundant polysaccharides that can be valorized from waste, specifically from crustacean shells and waste mango seeds from food processing facilities. These two materials have film-forming properties which can be exploited to create a bio-based biodegradable plastic film which can potentially replace conventional plastic packaging products.

Although chitosan-starch films have been the subject of other research works, there has not been a study that has utilized mango kernel starch as a viable starch source. Existing studies have only utilized starch from sources that have agricultural value or have a high demand in the food industry such as corn and tapioca starch. Furthermore, optimization has not been done for the formulation of chitosan-mango starch bioplastic film with glycerol as plasticizer. Thus, this study aims to fill the knowledge gap on the production of biodegradable plastic films from renewable, waste-derived materials, as well as optimizing its formulation which can be an essential steppingstone to aid future research works in developing more sustainable packaging materials.

The fabrication of the bioplastic films in this study were done via solution casting. Optimization of the bioplastic formulation was done through response surface methodology central composite design, wherein the dependent variables were starch (X_1) and glycerol (X_2) ratios with respect to a normalized chitosan concentration of 2% weight by volume (in 1% v/v acetic acid), and the elastic modulus being the sole response. Besides optimization and modeling, further characterization was done for mechanical properties, water vapor transmission rate, morphological properties, and biodegradability.

The authors believe that a prompt publication of this work and, thus, immediate relaying of information can greatly contribute to the field of sustainable packaging.

All authors have approved the submitted manuscript. There is no related work that is in the press. We are sending this manuscript exclusively to *Applied Chemical Engineering* (ACE).

Thank you very much for your kind consideration. I am looking forward to receiving comments from you and your reviewers.

Respectfully,

Noel Peter Bengzon Tan

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