

EVALUATION OF THE EFFECT OF THE MERGER OF AGENT NUCLEATING n- CaCO₃ HOW AND / OR MODIFIER OF MECHANICAL PROPERTIES OF POLY (LACTIC ACID) IN THE COMMERCIAL SECTOR FOR FOOD PACKAGING

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ABSTRACT

Poly (lactic acid) (PLA) is one of the most attractive biopolymers, with many short-term investments or disposable like disposable tableware (plates, cups, lids and straws), bags and packaging film. The PLA is also widely used in flexible packaging applications for food, since it has been approved by the U.S. Food and Drug Administration (FDA) as a substance that can have contact with food¹⁻². However, the use of PLA in food packaging is somewhat limited because of its poor ductility, poor thermal barrier properties and oxygen³. The aim of this work was to evaluate the effect of the nanofiller, calcium carbonate (n-CaCO₃), on the mechanical and cristalinity degree of PLA by using a 2ⁿ factorial design, with n=2 factors (process variables). The process variables analyzed were: n-CaCO₃ content and screw speed. The materials preparation was performed using a Teck Tril twin screw extruder with L/D ratio 36 and D=20 mm. The barrel temperature profile was set at 45/210/210/220/220/210/200/200/200/190°C. Firstly, the composites prepared were analyzed by X-ray diffraction (XRD) in order to evaluate the presence of nanoparticles dispersed in the PLA matrix. The samples to tensile and degree cristalinity analysis were prepared by injection and extrusion, respectively. The previous results showed that the addition of the nanofiller improved the mechanical properties of the PLA and an improvement in crystallinity was achieved.

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References

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