

MECHANICAL PROPERTIES OF FLEXIBLE FILM BASED ON STARCH AND PASSION FRUIT MESOCARP FLOUR ADDED OF NANOPARTICLES

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Nowadays, there is a concern to reduce the use of synthetic plastic materials because of environmental issues. Because of this, it has been favored research on biodegradable flexible films made with natural polymers such as starch. The use of a different carbon source as food wastes for production of polymers is interesting because it reduces the accumulation these residues and the cost of biopolymer. Passion fruit mesocarp flour (MF) is a material of low-cost, because it can be produced from industrial processing of juices. The aim of this study was to develop flexible films based on MF, and to characterize their mechanical properties. The use of clay nanoparticles (NP) was also investigated. Mechanical tests were performed using a texture analyzer. The film samples used were conditioned at 53% relative humidity (72 h). The tensile strength, the elongation at break and Young's modulus were determined with a minimum of 15 replicates for each film. It was observed that an increase of MF leads to an increase in modulus of elasticity and in tensile strength, as well as in a substantial reduction of elongation at break. The formulation based on the mixture of starch and MF resulted in films less rigid and less resistant when compared to starch films only. No significant differences were found for the film with NP ($P > 0.05$). The results of this study indicate that use of MF allows the preparation of films with mechanical properties similar to starch films, and other biopolymers in the literature.