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Effect of glycerol, sunflower oil and glucose concentrations on the physical -chemical and mechanical properties of chitosan / polyvinyl alcohol films

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Chitosan / PVA films have attracted considerable attention because they are biocompatible, water soluble, biodegradable and non-toxic. The aim of this work is to evaluate the effect of the addition of 3 plasticizers: glycerol (GL), sunflower oil (SO) and glucose (G), on the physical-chemical, mechanical and barrier properties of films based on chitosan and polyvinyl alcohol. The methodology implemented consisted in the preparation of chitosan / PVA solutions in a ratio of 1: 1 (w / w) by the sol-gel method, then different concentrations of plasticizer were added (20%, 40% and 60%). For the formation of the films, the solutions were placed in plastic Petri dishes and allowed to dry for 72 hours at room temperature. Subsequently, the properties of the films were evaluated as water vapor permeability (WVP), degree of swelling (DS), solubility (S), tensile strength (TS), elongation at break (% E) and biodegradability in the soil. The characterization of the plasticized films was carried out by infrared spectroscopy with Fourier Transform (FT-IR), thermogravimetric analysis (TGA) and scanning electron microscopy (SEM). With this research it is expected to obtain a biodegradable film that can be used in the field of food packaging materials and the pharmaceutical industry.

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