CHARACTERIZATION OF SUNFLOWER OIL/BREA GUM EMULSION BASED FILMS


The effect of sunflower oil (SO) addition on functional and morphological properties of films based on brea gum (BG) were evaluated. This effect was studied through film solubility, surface hydrophobicity and water vapour permeability. Mechanical properties were analyzed using tension test and the microstructure was observed with SEM. Films were plasticized with glycerol. Emulsions of SO/BG were prepared and films were obtained by casting. Oil content of 0 (Control film), 5, 10, 15 and 20% were tested. SEM images show that BG films are dense and without pores or pinholes while SO/BG films present microdrops ranged from 2 to 5 µm in diameter. The heterogeneous structure with micro-holes inside the polymeric matrix causes a decrease in tensile strength from 5.39 (0% SO) to 1.06 MPa (20% SO) due to the existence of potential breaking points inside the film. Water vapour permeability decreases from 6.04x10^{-10} (0% SO) to 2.42x10^{-10} g.m^{-1}.s^{-1}.Pa^{-1} (20% SO) because oil drops hinder the passage of the water molecules that diffuse through the film increasing the tortuosity of the water path. Surface hydrophobicity increases with SO addition, it is evidenced by the increase in contact angle from 59.3 (0% SO) to 68.6° (20% SO). Film solubility in water decreases from a 78 (0% SO) to 64% (20% SO). Film elongation is not significantly altered by SO addition (average value: 6.86%) because the interactions between hydrophilic polymer chains are not affected by SO incorporation. Oil addition improves water resistance and water barrier properties of BG films.

Poster presentation