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Biodegradable starch/starch nanocrystal nanocomposite films for food packaging applications

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Starch is distinguished for its excellent biocompatibility and controllable biodegradability and have new uses in specialized technical areas. However, despite of widespread use in the food industry, the use of starch films for food packaging has been strongly limited because of the poor barrier properties and weak mechanical strength[1]. Starch/starch Nanocrystal (SNC) biohybrid nanocomposite films were prepared with SNC and starch aqueous solution[2]. In this work, we incorporated SNC, which were acidic hydrolyzed from potato starch granules, into waterborne Starch solution in different amount of SNC. SNC size was about 75 ± 10 nm that determined by using dynamic light scattering (DLS). X-ray diffraction patterns suggested that exfoliated nanocomposite could be achieved. Furthermore, the tensile strength and Young's modulus were improved notably, which increasing SNC content. The complexation of starch with SNC was confirmed by differential scanning calorimetry in which a second glass transition was detected at higher temperatures. Based on the obtained results, it can be inferred that the starch based biohybrid films are potential materials to be used in food packaging technology[3].

References:

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