

TÍTULO: STABILITY AND CHARACTERIZATION OF NANOCRISTALS PRODUCTION FROM BACTERIAL NANOCELLULOSE.

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ABSTRACT: The bacterial nanocellulose is a biopolymer produced by *Gluconacetobacter xylinus* with non-toxicity, crystallinity and be able to become nanocrystals when hydrolyzed. The nanocrystal has application in the pharmaceutical and food industries. Bacterial cellulose nanocrystals (NCC) can be produced by different ways processes, including by hydrolysis utilizing an enzyme. In this work, the stability and the characterization of the NCC were studied. Therefore the bacterial nanocellulose was produced and mashed by ultraturrax. The samples were centrifuged at 4500 rpm for 10 minutes, and oven dried at 50°C. For the NCCs production 0.01 g of the bacterial cellulose were mixed with 150 µl of the cellulase and 1 mL buffer solution at 5 pH. The samples were kept under agitation by 150 rpm at 50 ° C for 48 and 72 hours. After the time the enzyme was inactivated by thermostatic bath at 80°C for 20 minutes. The samples were centrifuged (20 minutes, 5500 rpm), the supernatant was collected, ultrasound (20 min, 35 ° C) and filtered by 0.45 µm. The final sample was separated in two groups, (i) 5 mM NaCl was added, the other (ii) was without salt. The groups were kept at 4°C and samples were collected in diferente period of times 0, 1, 4, 7, 14 and 21 days. In each sample the size of the NCC, the index of polydimensionality (PDI) and the zeta potential were analyzed. The results showed the best size and potential zeta of the NCCs after 72 hours of enzymes comparing with NCCs 48 hours, while the PDI did not change. The NaCl only enhances the stability of the size for 48 hours, in the other times the size was hihger than. For PDI and zeta potential, there was no improvement at both times. It is possible to obtain NCC from bacterial cellulose. The addition of preservatives and the storage time are fundamental in the variations of size, PDI and zeta potential of the samples.

Keywords: bacterial cellulose, nanocrystals, stability, characterization.

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