



## CHEMICAL AND PHYSICAL CHARACTERIZATION OF CELLULOSE NANOCRYSTALS EXTRACTED FROM MELON AND PINEAPPLE FRESH-CUT FRUITS WASTES

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Fresh-cut fruits industries releases high volumes of wastes, such as peels, shells, rinds, pips, seeds as others wastes. From melon processing, 38-42% of the fruits is used while 58-62% is discarded, as for pineapple, ca. 65% of the fruit is wasted. These particular wastes are rich in cellulose, which can be used in the production of cellulose nanocrystals (CNC). CNC are rigid rod-like particles with widths range of 100-1000 nm, with several interesting properties. They are negatively surfaced charged and able to react with bioactive and drug compounds and hence being used as compound delivery system. Thus, the present research work describes the purification and extraction of CNC from melon and pineapple wastes. The cellulose purification and CNC extraction involved several alkaline and acid processes. The chemical characterization of the fiber products resulting from each step of the treatment was performed; the final CNC were characterized in terms of lignin, and holocellulose contents ( $\alpha$ -cellulose and hemicellulose). The physical characterization of the final CNC was made using dynamic light scattering (DLS), for CNC size and charge determination. The morphological features of the fibres at each treatment stage and the final CNC were observed with Scanning Electron Microscopy (SEM). A decrease on the content of lignin was observed by the first step of purification. The small size and negative charges were confirmed. Melon and pineapple wastes proved to be good sources of cellulose for CNC production.

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