



Effect of freezing temperature and sucrose on pore size of microfibril cellulose

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In this study aims to prepare the microfibril cellulose (MFC) structure by using a technique of freezing temperature and cryoprotectant as sucrose to increase a pore size of MFC structure. The MFC was produced from coconut water by *Acetobacter* sp. TISTR 975 under static incubation at 30 °C for 7 days. The cellulose pellicle (CP) was occurred on the coconut water. The CP was cut to a small piece of ~1 cm³ prior to immerse into 30 % (w/v) sucrose syrup to compare a control without sucrose. The saturated CP pieces were frozen at different temperature (0 °C, -20 °C, -40 °C and -80 °C) for 24 h, then were washed with water and dried at 80 °C for 2 h. The dried CP was determined by surface area (BET 5 points) and porosity analyzer (BET 95 points) at 40 °C under nitrogen gas condition. The result showed significantly the highest surface area and volume of pore size of the CP sample that freeze at -80 °C were 19.26 m²/g and 0.0408 ml/g, respectively. Further, this technique could be used to enclose the most probiotic cell in the structure of Nata to improve a nutritive value.

Keywords: Microfibril cellulose; Nata; Freezing temperature; Cryoprotectant; Porosity analyzer (BET)