ABSTRACT

The demand for implants in Indonesia by 2022 will reach 250,000 units, with the largest demand being bone implants. However, 96% of the total implant demand is dominated by imports. In view of these problems, the development of domestic implant needs continues to be improved. This study aims to compare methods of making hydrogel material from bacterial cellulose-chitosan biocomposite to find the most optimal method for medical implant applications. Bacterial cellulose (SB) was formed from coconut water fermented by Acetobacter xylinum then homogenized with 2% (w/v) chitosan solution and added 2% (v/v) glycerol or 2% (v/v) glutaraldehyde and heated using a hotplate stirrer at 80°C for 4 hours with a rotation speed of 500 rpm. The testing parameters carried out in this study were FTIR test, stability test, viscosity test, and fluid affinity test. FTIR analysis showed that there was imine bond (C=N) formed from crosslinking between NH2 group on chitosan and C=O group on glutaraldehyde. The stability test results showed good hydrogel stability in each sample variation as seen from the absence of changes during stability testing using the freeze thaw method on pH; color; and odor and no sediment occurred during physical testing using a centrifuge machine. The highest to lowest average viscosity value is found in the SB-Kitosan sample; SB-Kitosan with the addition of glycerol; and SB-Kitosan with the addition of glutarldehyde with 3132 Cps; 3024; and 2708, respectively. In fluid affinity testing, each variation of hydrogel material formed is type 1E with an average value of absorption below 4% and donation of 20-25% which can provide better fluid and is suitable for application to dry wounds.

Keywords: *Bacterial cellulose, chitosan, hydrogel, glutaraldehyde, glycerol*