CHAPTER V
CONCLUSIONS

In this work, a bionanocomposite sponges of SF and CLWs were fabricated by freeze drying technique by varying the blend ratios of SF and CLWs. The obtained bionanocomposite sponges had interconnected porous structure. The conversion of SF conformation from random coil into β-sheet should be enhanced by blending the SF with the CLWs because the interactions, like hydrogen bonding, between SF and CLWs induce the transition of SF conformation. The methanol treatment also able to enhance the conformation transition which significantly increase the water stability of the sponges. The SF/CLWs bionanocomposite sponges could be used as a supporting matrix for immobilization of yeast cell for using in ethanol production. The immobilization of *S. cerevisiae burgundy* KY11 was performed by adsorption of the yeast cells on SF/CLWs sponges. The 50/50 ratio of SF/CLWs bionanocomposite was chosen as a matrix due to its large pore width that allowed the largest amount of yeast cell pass through and the CLWs exhibited long and slender fibril that provided high surface area for yeast attachment. The fermentation was performed by using glucose with varied concentration as a substrate. The system using immobilized yeast cells was more efficient than when using free cells based on glucose conversion into ethanol (%). Immobilization can lessen the effect of substrate inhibition. The glyoxal crosslinked improved cell immobilization efficiency but its toxicity affected to cell's activities. The yeast immobilized bionanocomposite sponges able to be reuse with stability yield. In addition, after the end of fermentation, the bionanocomposite sponge containing yeast cell can be used as animal feed due to SF and yeast cell are excellent sources of protein and also biodegradable.