ABSTRACT

Over time, the increasing use of energy causes depletion of energy availability, especially in Indonesia. This condition encourages people to innovate in developing renewable energy sources by utilizing the available natural resources. In this case, the development carried out has resulted in Bioethanol, but the length of time and high costs required in the process of making Bioethanol make this development considered ineffective. With this, a bioethanol fabrication design was developed by utilizing palm oil and palm waste in collaboration with ionic liquid pretreatment using the SuperPro Designer (SPD) software. The pretreatment process is carried out by mixing the biomass with ionic liquid which is then saccharified and fermented to produce bioethanol which is environmentally friendly. In this capstone design, palm and oil palm biomass are used with different Ionic Liquids. Based on research that has been done, this ethanol fabrication design is very supportive of optimizing biomass into bioethanol with a biomass/ionic liquid ratio of 0.5. This design can produce optimal Bioethanol, both in terms of optimal production yield and in terms of economical costs. Thus, this design can be used as a recommendation for bioethanol production.

Key words : Biomass, Bioethanol, Ionic Liquid, SPD software