

**OPTIMIZATION OF SORGUM STEM PRETREATMENT FOR
BIOETHANOL PRODUCTION USING CENTRAL COMPOSITE
DESIGN METHOD**

Student Name : 1. Aprillia Nur Azizah
2. Farahdila Popy Imerfirdaus

Student Identity Name : 1. 2031910009
2. 2031910024

Advisor : Ir. Mala Hayati Nasution, S.T., M.T.

ABSTRACT

Energy is a basic human need, which continues to increase along with the level of life, one of which is petroleum. Efforts to overcome the limited availability of petroleum is to develop alternative energy sources. Sorghum stalk is a lignocellulosic biomass containing lignin, cellulose and hemicellulose so that sorghum stem has the potential to be processed into bioethanol. The aims of this study were: (i) to determine the initial or pretreatment stages in the production of sorghum stem bioethanol. (ii) to determine the effect of temperature parameters and NaOH concentration on the pretreatment process of sorghum stalks for the bioethanol production process. (iii) to determine the optimum conditions for the pretreatment process of sorghum stems for the bioethanol production process. In this research, "Optimization of the pretreatment process of sorghum stems as bioethanol using the Central Composite Design method" with variations in NaOH concentrations and optimization of the pretreatment operating conditions of sorghum stems. NaOH concentration variable is 8% - 10%. The temperature variable is 70°C - 80°C. Based on the research, the optimum pretreatment point was obtained at a temperature of 75°C with a concentration of 9% NaOH which resulted in a cellulose content of 57.78% and 5.73% hemicellulose.

Keywords: Bioethanol, Sorghum stalks, Energy.