

ABSTRAK

PRODUKSI BIOETANOL DARI SABUT KELAPA DENGAN METODE *SIMULTANEOUS SACCHARIFICATION FERMENTATION* (SSF) DITINJAU DARI PENGARUH KONSENTRASI NAOH DAN DAYA *MICROWAVE*

(Dina Dwi FM, 2026. Skripsi; 55 Halaman, 5 Tabel, 22 Gambar)

Sabut kelapa merupakan limbah lignoselulosa yang mengandung selulosa tinggi dan berpotensi besar sebagai bahan baku bioetanol. Penelitian ini bertujuan untuk mengetahui pengaruh variasi konsentrasi NaOH (0,5 M; 1 M; 1,5 M) dan daya *microwave* (400W; 450W; 500W; 550W, 600W) pada proses *pretreatment* alkali terhadap penurunan kadar lignin dan hasil produksi bioetanol melalui metode *Simultaneous Saccharification and Fermentation* (SSF). Kadar lignin awal sabut kelapa sebesar 34% dianalisis menggunakan metode *Chesson-Datta*. Hasil penelitian menunjukkan bahwa peningkatan konsentrasi NaOH dan daya *microwave* secara konsisten menurunkan kadar lignin, dengan efisiensi delignifikasi tertinggi 71,18% pada NaOH 1,5 M dan 600 W. Kondisi optimum produksi bioetanol diperoleh pada NaOH 1 M dan daya 500 W, menghasilkan kadar etanol 26% (volume 178 mL), kadar gula 10%, pH 7, dan titik nyala api 43,7°C.

Kata Kunci: bioetanol, sabut kelapa, NaOH, *microwave*, *pretreatment*, SSF

ABSTRACT

BIOETHANOL PRODUCTION FROM COCONUT HUSK VIA SIMULTANEOUS SACCHARIFICATION AND FERMENTATION (SSF): AN ANALYSIS OF THE EFFECTS OF NAOH CONCENTRATION AND MICROWAVE POWER

(Dina Dwi FM, 2026. Thesis; 55 Pages, 5 Tables, 22 Pictures)

Coconut husk is a lignocellulosic waste with high cellulose content, offering significant potential as a bioethanol feedstock. This study aimed to investigate the effect of NaOH concentration (0.5 M; 1 M; 1.5 M) and microwave power (400W; 450W; 500W; 550W; 60 W) during alkaline pretreatment on lignin removal and bioethanol production via the Simultaneous Saccharification and Fermentation (SSF) method. The initial lignin content of coconut husk was 34%, analyzed using the Chesson-Datta method. Results showed that increasing NaOH concentration and microwave power consistently reduced lignin content, achieving the highest delignification efficiency of 71.18% at NaOH 1.5 M and 600 W. The optimum bioethanol production condition was obtained at NaOH 1 M and 500 W, yielding an ethanol content of 26% (volume 178 mL), sugar content of 10%, pH 7, and flash point of 43.7°C.

Keywords: bioethanol, coconut husk, NaOH, microwave, pretreatment, SS