

ABSTRACT

THE EFFECT OF ALKALI PRETREATMENT AND ACID HYDROLYSIS ON BAGASSE-REDUCED SUGAR AS RAW MATERIAL OF BIOETHANOL

By

NOVITA SARI

Bagasse, solid by product of sugar cane industries, contains high lignocellulose consisting of 46.3% cellulose, 23.0% hemicellulose and 19.7% lignin. The bagasse can be converted into bioethanol after pretreating with base and acid and then fermenting with microbes. The objective of this study was to find out the effects of sodium hydroxide pretreatment and sulfuric acid hydrolysis on bagasse reduced sugar. In this study, there were 2 treatments with 3 replications. The first treatment was submerssion bagasse into 0.50 M NaOH solution at a temperature of 121°C for 15 minutes. The second treatment was concentrations of sulphuric acid (H₂SO₄) that consisted of 5 levels, that are 0 M, 0.05 M, 0.10 M, 0.20 M, and 0.30 M. One and an half grams of dried and ground bagasse was put into 100 mL erlemeyer flash and then added with 30 mL 1.0 M NaOH solution. The flash was heated at a temperature of 121°C for 15 minutes. After filtering, the residue was hydrolyzed with H₂SO₄ solution. The residue as well as 1.5 g dried and ground bagasse without pretreating with NaOH was

hydrolyzed with 15 mL H₂SO₄ at concentrations of 0, 0.05, 0.10, 0.20, and 0.30 M at a temperature of 121°C for 15 minutes. Filtrates of the solutions were taken to analyze their reduced sugar content. The highest reduced sugar (4.20 ml/mL) was yielded when bagasse was directly, hydrolyzed with 0.05 M H₂SO₄ at a temperature of 121°C for 15 minutes.

Keywords : Bagasse, lignocellulose, sulphuric acid, reducing sugar, sodium hydroxide