DESULFURIZATION OF JAMBI PROVINCE COAL USING HYDROGEN PEROXIDE (H_2O_2) – HYDROCHLORIC ACID (HCl) PRE-TREATMENT BY ULTRASONIC -ASSISTED SYSTEM

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This Final Year Project Report entitled "**Desulfurization of Jambi Province coal using Hydrogen Peroxide (H_2O_2) – Hydrochloric Acid (HCl) pre-treatment by Ultrasonic -Assisted System"** was submitted by Nur Farah Eizlin Binti Suhaimi in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Applied Chemistry, in the Faculty of Applied Science, and was approved by

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ABSTRACT

DESULFURIZATION OF JAMBI PROVINCE COAL USING HYDROGEN PEROXIDE (H_2O_2) – HYDROCHLORIC ACID (HCl) PRE-TREATMENT BY ULTRASONIC -ASSISTED SYSTEM

The digestion of ultrasonic assisted system and the acid leaching process are the two combining method that used to remove the total sulfur in coal sample. During this desulfurization process, the coal samples had been treated with a different ratio concentration of acidic solution. The Hydrogen Peroxide (H_2O_2) – Hydrochloric Acid (HCl) solution were divided into ratio of: 20:80 , 40:60 , 60:40 and 80:20 respectively. The temperature (℃) value remains constant at ± 30 ℃ and times taken for the Ultrasonic Assisted process stated to be in 10 minutes for the 1st batch and 30 minutes for the 2nd batch of samples. The effect of the ratio concentration and time taken towards the percentage of total sulfur removed had been analysed. Fourier Transform Infrared Spectroscopy (FTIR) is used to support the analysis. Through the findings, it shown that the sample of coals that had been treated via ultrasonic assisted system for 30 minutes with 60% of Hydrogen Peroxide (H_2O_2) and 40 % of Hydrochloric Acid (HCl) solution gives the highest percentage of total sulfur removal which around 89.71 %. At certain wavenumber (cm^{-1}), it found that there is a changes of the peak spectrum of Sulfur Dioxide,SO_2 observed when being analysed with raw coal and treated coal. In conclusion, the coal desulfurization using ultrasonic-assisted chemical pre-treatment with Hydrogen Peroxide (H_2O_2)-Hydrochloric acid has a great potential to removes sulfur at mild conditions.

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