REMOVAL H₂S AND CO₂ IN BIOGAS BY ADSORPTION METHOD WITH NATURE ZEOLITE AS ADSORBENT

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ABSTRACT

Biogas is one of the alternative energy which is now being developed as substitution of the energy derived from organic materials. In the biogas production, purification of biogas is the most important thing. If methane gas contain in biogas is higher, so the quality of biogas is better. Whereas, in biogas there is carbondioxide which is can reduce the purification of biogas. Beside that, there is also hydrogen sulphide which is can cause a corrosive. With that result, in use of biogas as alternative energy, purification biogas from carbondioxide and hydrogen sulphide is needed. The one of methode for biogas purification is adsorption with nature zeolite as the adsorbent.

The purpose of this research is to determine the effect of natural zeolite particle size variations on adsorption process to decrease the CO₂ and H₂S contain in biogas production. Thus, biogas is obtained with high purity and also environmentally friendly. The product biogas is adsorpted by natural zeolite in adsorption column with 150 cm on height, the inside diameter is 3.75 cm, and the outside diameter is 4.5 cm. The particle size of natural zeolite are vary, 4, 8, and 12 mesh. With that variation of natural zeolite particle size in this research, it will be known to the influence of different sizes of natural zeolite in reducing CO₂ and H₂S gas content in the biogas production. In this research, the
component analysis was done by chromatography gas method. The content of biogas has analyzed before the adsorption process and after the adsorption process every 30 minutes until nature zeolite was saturated.

From the analysis results, then compared to the efficiency of each size particle of natural zeolite in reducing CO$_2$ and H$_2$S gas content in the biogas production. The best result on removal CO$_2$ and H$_2$S content in biogas was shown by nature zeolite with particle size 12 mesh and flowrate input is 400 ml/min with % removal for CO$_2$ is 87,04% and for H$_2$S is 65%. And CH$_4$ content in biogas was increased after adsorption process with % increasing is 35,7%

**Key words : biogas purification, adsorption, natural zeolite**