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Removal of CO₂ from biogas plant using chemical absorption column (Conference Paper)Mel, M.^a, Sharuzaman, M.A.H.^a, Setyobudi, R.H.^{b,c}^a Department of Biotechnology Engineering, Faculty of Engineering, International Islamic University Malaysia (IIUM), Gombak, Kuala Lumpur, Malaysia^b Ma Chung Research Center for Photosynthetic Pigments, Villa Puncak Tidar N-01, Malang, East Java, Indonesia^c Indonesian Association of Bioenergy Scientist and Technologist. BPPT Building II, 22nd Floor Jl. MH. Thamrin No. 8, Jakarta, Indonesia

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Abstract

Biogas typically refers to a mixture of gasses produced during the breakdown of biodegradable organic matter in the absence of oxygen. It is primarily comprises 45-75% (v/v) of methane (CH₄), 25-55% (v/v) of carbon dioxide (CO₂), 2000ppm of trace element hydrogen sulfide (H₂S), and ammonia (NH₃). The presence of CO₂ and H₂S may affect the performance of biogas. Hence, its removal before its use is crucial to improving the quality of biogas. In this work, a method to purify both gasses, CO₂ and H₂S were employed by using a sodium hydroxide solutions (NaOH). CH₄ composition after treatment was also studied as removal of impurities is interrelated to CH₄ enhancement. The concentrations of sodium hydroxide were varied as well as the biogas flow rate. Experiments that revealed the highest removal efficiency had been achieved at 14% concentration of sodium hydroxide solution used and the maximum absorption capacity was achieved when CH₄ increment is about 54.9% from its original value. In the continuous flow, the composition of CH₄ increased up to 26% of H₂S removal, however, was unable to achieve the target due to its low concentration (ppm) in biogas mixtures. Hence, there are no significant changes in its concentration that are worth to be analyzed. © 2016 Author(s).

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