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A STUDY OF CO_2 METHANATION OVER NICKEL BASED CATALYST- A REVIEW

Muhammad Faid Syahmi, and Siti Aminah Md Ali*

Faculty of Chemical Engineering, Universiti Teknologi MARA, Cawangan Pulau Pinang, 13500 Permatang Pauh, Pulau Pinang Malaysia

**Corresponding author: sitiaminah.mdali@uitm.edu.my*

Abstract:

The population has rapid growth as a result of increased resource utilization presently. The energy consumption from carbon contain substance resulted in harmful effect to the atmosphere due to high in concentration of carbon dioxide (CO_2) and greenhouse effect as carbon gasses emitted. There are actions have been taken to control the CO_2 emission by converting CO_2 through methanation process which is that a reaction between carbon dioxide with hydrogen at exothermic condition. The main objective of this research project is to review and determine which catalyst combination shows the most excellent outcome of reaction. Review on X-ray powder Diffraction (XRD) and H2 temperature Programmed Reduction (H2-TPR) of nickel-based catalyst on the dispersion and reduction of nickel particle when methanation occur. From the review, it shows that several of support effects the catalyst dispersion and reduction. Unsupported Ni based catalyst show good response to the analysis but still supported Ni based catalyst show more stable reaction and good conversion on CO_2 methanation.

***Keywords*:** CO_2, Methane, Ni, H_2, Methanation

Objectives:

1. To review study on unsupported and supported nickel-based catalyst for CO_2 methanation.
2. To determine the best condition and combination of nickel-based catalyst for its physico-chemical properties using different type of analysis.