Studies on the Steam CO_2 Reforming of Methane at high pressure for GTL-FPSO Applications

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Steam CO_2 reforming (SCR) of methane for the production of syngas was investigated over Ni-based catalysts for GTL – FPSO (Floating Production Storage and Offloading) applications. The Ni-based catalysts were prepared by an impregnation method. The catalysts before and after the reaction were characterized by N_2 physisorption, XRD and TEM techniques.
The H_2/CO ratio produced in the SCR showed a strong dependence on the feed composition. The conversion of CH_4 was increased with increasing the concentration of H_2O and CO_2 in the feed. For the application in GTL-FPSO process, production of syngas by SCR with high pressure (25 bar) was simulated by PRO-II. The simulated results were compared with experimental results in a fixed bed reactor system by controlling the feed molar ratios of CH_4 : H_2O : CO_2. It was found that Ni/MgO catalyst showed higher catalytic performace than Ni/γ-Al_2O_3 and Ca-Ni/γ-Al_2O_3 catalysts in GTL-FPSO process applications.