

Partial oxidation of methane on co-precipitated Ni–Mg/Al catalysts modified with copper or iron

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Description

Methane transformation to hydrogen and synthesis gas ($\text{CO} + \text{H}_2$) by heterogenous catalysts can play an important role to secure the supply of energy, chemicals and fuels in the future. Methane is the main constituent of natural gas and biogas and it is also found in crystalline hydrates at the continental slopes of many oceans. In view of this vast reserves and resources, the use of methane as chemical feedstock has to be intensified. In this present work, (NiMg)Al catalysts doped with Fe or Cu, prepared by co-precipitation method and characterized by different techniques, were studied in the partial oxidation of methane ($T_{\text{reaction}} = 750 \text{ }^\circ\text{C}$, CH_4/O_2 ratio = 2). The effect of catalyst composition and pre-treatment conditions of these catalysts were investigated. Also, these catalysts show a very high activity and selectivity in the partial oxidation reaction, which depends on the conditions of catalysts preparation. The