Effect of various promoters on Ni-based Catalyst for production of SNG from coal gas

장선기, 윤석훈, 박노국, 이태진*, 고동준[1], 변창대[2], 임효준[2]
영남대학교; [1]포항산업과학연구원; [2]Posco
(tjlee@ynu.ac.kr*)

In this study, the Ni-based catalysts for the production of SNG(synthetic natural gas) were prepared by precipitation and the reactivity tests were carried out for the methanation of synthetic gas on the Ni-based catalysts. Ni and Al_2O_3 were used as the main active component and the support materials, respectively. Ni-based catalysts were also applied to various addictives (Magnesium, Aluminum, Calcium, etc.) to improve high dispersion of Nickel and prevent catalytic deactivation such as Nickel sintering, carbon coking. The methanation of synthetic gases was performed under various reaction conditions. The prepared catalysts (100~200㎛) was reduced in 10% H_2/N_2 at 500℃ for 4h prior to the catalytic test. The ranges of the reaction conditions were the temperatures of 300℃, H_2/CO mole ratio of 3 and the space velocity of 10000~60000 ml/g_{cat}·h. To compare commercial catalyst, the reaction test were conducted extremely condition such as the space velocity of 60000 ml/g_{cat}·h and effect of various addictives were investigated. Ni-Mg-Al_2O_3 and Ni-Al-Al_2O_3 have very high activity in the reaction of CO methanation.