Effect of Ni loading on the catalytic performance over Ni/MgO−Al$_2$O$_3$ catalysts for carbon dioxide reforming of methane using coke oven gas

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In our previous result, MgO−Al$_2$O$_3$ supported Ni catalyst showed good catalytic performance in carbon dioxide reforming of methane (CRM) using coke oven gas. In this study, Ni loading was optimized to obtain highly active Ni/MgO−Al$_2$O$_3$ catalysts for CRM using coke oven gas even at the high gas hourly space velocity (GHSV) of 1,500,000 h^{-1}. Among the prepared catalysts, 15 wt.% Ni/MgO−Al$_2$O$_3$ catalyst shows the highest CH$_4$ conversion (XCH$_4$ > 86.0%). This result is mainly due to the large amount of Ni active sites which related to Ni loading, Ni dispersion, and reduction degree.