

M. Zhudenko, Ph.D. student,
T. Zakharova, Ph.D.,
S. Gayday, Ph.D., gaidaisv@mail.ru,
A. Yatsimirsky, Ph. D.
Taras Shevchenko National University of Kyiv, Kyiv

ACTIVITY OF Co-Ni CATALYSTS SUPPORTED BY SiC AND THERMOEXPOLIATED GRAPHITE IN CO₂+H₂ REACTION

The catalytic activity of Co-Ni/SiC and Co-Ni/thermoexpholiated graphite (TEG) catalysts in the CO₂+H₂ reaction was investigated. Stable highselective at 300-500 °C catalysts are obtained. It is shown that catalysts on the SiC support are more active at lower temperatures than that on the TEG support due to possible graphitization of the catalytically active mass.

Three series of catalysts with different Co-Ni ratio were obtained: 1) 20 % of metals on SiC (0.6 m²/g), 2) 20 %of metals on TEG (150 m²/g) and 3) 60 % metals on TEG. For all series total conversion of CO₂ was registered. Selectivity towards H₂ was 99 % for the SiC series. Maximum activity was seen for the samples with Co-Ni ratio of 60-40 to 80-20. Series with 60 % of metals on TEG exhibits lower activity than that with 20 %, that can be explained by lower dispersity of metals on the surface and graphitization of metals. The highest activity was exhibited by SiC series despite of low specific surface. This can be explained by higher absolute mass of metals loaded on SiC in comparison to TEG due to high density of the SiC support. TPD MS investigations of the surface layer showed that no intermediates are desorbed, only CH₄ and CO were registered by mass spectrometer. Hence the additional kinetic experiments must be conducted on order to discriminate possible mechanisms of the reaction.

Keywords: CO₂+H₂ reaction, Co-Ni catalysts, thermoexpholiated graphite, SiC.