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The investigation of catalytic activity of polyoxide catalysts on the base of fiberglass in the reaction of carbon dioxide conversion of methane

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In the present work, studies of catalytic activity of nanostructured polyoxide catalytic systems (MgO, NiO and CoO) supported on glass fiber in the reaction of carbon dioxide conversion of methane were performed. The reaction was conducted in a vertical quartz flow reactor. The analysis of initial reagents and reaction products was carried out by "on-line" gas chromatography using a “GC-1000 Chromos” instrument with software. The deposition of active phases onto fiberglass support was performed by a "solution combustion" method.

The effects of catalyst composition, temperature and contact time on the methane conversion and the yield of the target product-synthesis gas were studied. The most significant effect of temperature on the methane conversion and yield of the end product was observed in the temperature range of 750-850^{0}C. It was shown that all phases present in the catalyst composition contributed to the process under study.

A study of physico-chemical characteristics of prepared catalysts samples by AFM, TPR, TEM and SEM methods was performed. It was shown that the active component on the surface of fiberglass was present in the form of nanoparticles with a size of 8-10 nm.

Biography

Z A Mansurov is a General Director of the Institute of Combustion Problems, Kazakhstan. His scientific activity includes study and investigations of kinetics and mechanisms of hydrocarbon combustion and structure of cool soothing flames: catalytic carbon formation and its applied aspects. In 2002, he received Diploma for discovery of “Phenomenon of low-temperature cool-flame soot formation”. His professional career includes longstanding activity in INTAS Council of Scientists (Representative from Kazakhstan); participation in various international conferences including NATO-Workshops, author of more than 600 scientific papers; Editor-in-Chief of “Eurasian Chemico-Technological Journal” indexed at Scopus and “*Combustion and Plasmochemistry Journal*”.

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