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**OBTAINING HIGH-MOLECULAR HYDROCARBONS FROM
SYNTHESIS GAS AND PHYSICO-CHEMICAL CHARACTERISTICS OF
THE CATALYST**

Shukurov J.H*; Kunguratov K.A*; Ortiqov N.R; Fayzullaev N.I*****

*Academic Lyceum of Samarkand State University,
Samarkand, UZBEKISTAN

**Karshi Engineering Economics Institute,
Karshi, UZBEKISTAN

***Samarkand State University,
Samarkand, UZBEKISTAN

ABSTRACT

The article studied the reaction of obtaining high-molecular hydrocarbons from the synthesis gas and the physicochemical characteristics of the catalyst containing Co-Fe-Ni-ZrO₂/HSZ used in this process. The reason for the increase in selectivity in methane formation is, firstly, the acceleration of the hydrogenation reaction of CO in the methane formation centers with increasing synthesis temperature and secondly, the diffusion of CO and H₂ at different speeds through zeolite pores. In all fractions of hydrocarbons synthesized in the presence of hybrid catalysts, secondary changes: isoparaffins and olefins are formed due to cracking and isomerization. A large amount of isoparaffins is recorded for the composite catalyst - the iso/n parameter is 0.6, which indicates an increase in its activity relative to the catalysts absorbed in the hydrogenation reactions. For catalysts with low cobalt content, the concentrations of olefins will be high, which is due to their low hydrogenation ability compared to unsaturated hydrocarbons. In absorption catalysts, the hydrocarbon synthesis centers and the zeolite acid sites are in close contact with each other, which contributes to the intensification of secondary processes. However, the content of liquid hydrocarbons (C₅-C₁₈) in C₅+ hydrocarbons is about 83%, which is 12% less than in the composite catalyst. No oxide-oxide interaction was found for the composite catalyst prepared by mixing the components, the pores of the zeolite are not

blocked by cobalt, which allows the reagents to be efficiently delivered to the active part of the hydrocarbon synthesis.

KEYWORDS: *Synthesis Gas, High Molecular Weight Hydrocarbons, Catalyst, IR Spectrum, Diffractogram.*

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