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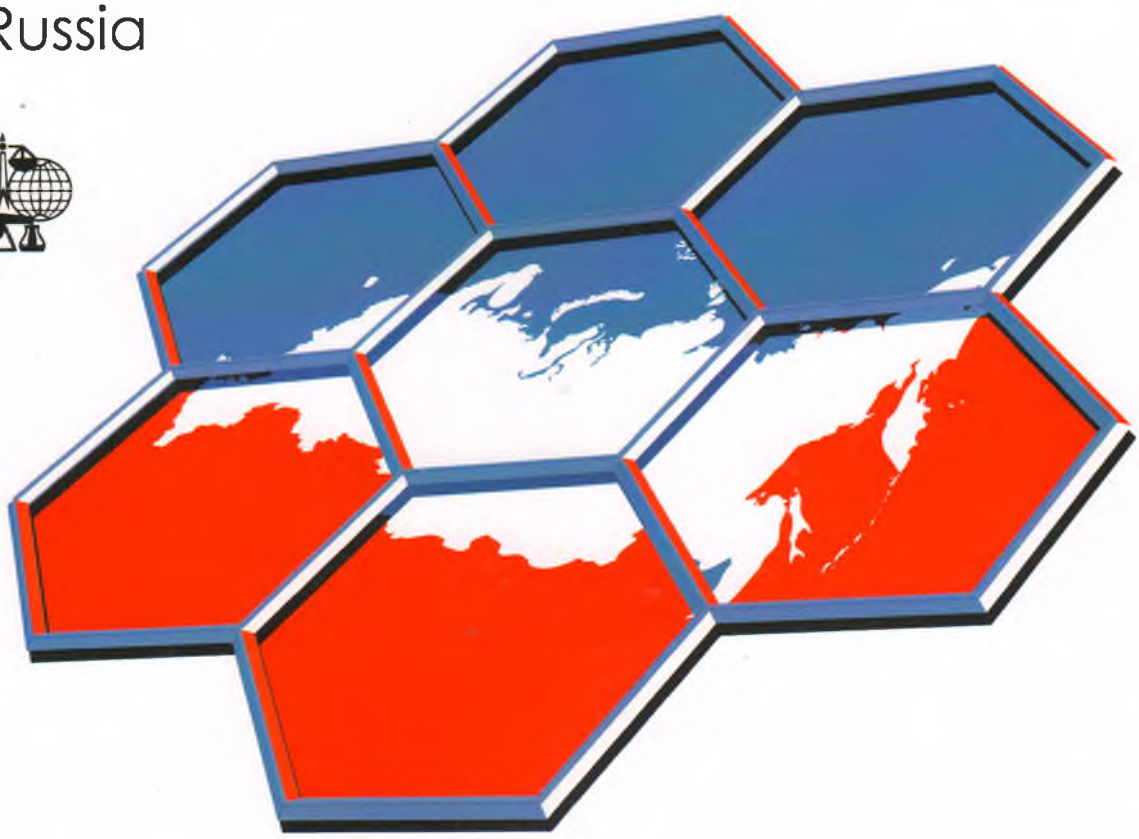

# Book of Abstracts

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## OXIDE CATALYSTS IN BIOETHANOL CONVERSION

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According to forecasts, by 2015 the available oil reserves will be exhausted by 60% and its production will fall by 30-40%, while the energy consumption in the world by 2030 will grow by 60%. New basic raw material can replace the fuel oil in the manufacture and in the chemical industry, is bio-ethanol obtained in processing biomass, the use of which also helps to reduce the "greenhouse effect" by reducing carbon dioxide emissions into the atmosphere. Further processing of bio-ethanol is considered promising for producing feedstock components for motor fuels, olefins (ethylene) and aromatic hydrocarbons. The present work is devoted to the determination by physical and chemical methods of phase composition, state of the active phase, dispersion and acid characteristics of zinc-containing catalysts that influence its activity in the producing of aromatic hydrocarbons.

Zinc-containing catalysts were prepared by impregnating the carrier (3A) on wetness and combustion method. Testing the activity of the catalysts (Zn / 3A, ZnP / 3A) in ethanol conversion was carried out in a continuous mode. Physical and chemical characteristics of catalysts were investigated by scanning and transmission electron microscopy (SEM, TEM), elemental analysis (EA), BET, temperature programmed reduction with hydrogen (TPR- $H_2$) and temperature programmed desorption of ammonia (TPD-$NH_3$).

The study of the phase composition, the state of the active phase and dispersion by physical-chemical methods showed that the synthesized catalysts are nanophase. The method of preparing the catalyst affects its morphology and dispersion. Preparation of 2 ZnP / 3A catalyst by solution-combustion method increases the dispersity of catalyst particles, particle size is reduced from 30 to 2 nm, which positively affects the activity of the catalysts in the conversion of ethanol into aromatic hydrocarbons. TPR – $H_2$ results showed that zinc oxide in the catalyst is in three forms, characterized by metal-support interaction with different force. Preparation of 2 ZnP / 3A catalyst by solution-combustion method reduces the interaction between active component and carrier, thereby increasing the catalyst activity. Determination of formation of acid sites on the surface of zinc-containing catalysts by TPD of ammonia showed the presence of both weak and strong acid sites. Introduction of the phosphorus oxide into the ZnO / KA increases the total number of acid sites, besides phosphorus oxide participates in the formation of strong acid sites, which increases the activity of the catalyst in the formation of aromatic hydrocarbons.