RADIATION EFFECTS OF NEAR-FIELD IN GAMMA ACTIVATED NANOPARTICLES ZrO_2–CATALYSTES IN METHANOL CONVERSION

Dikiy N.P.[1], Dovbnya A.N.[1], Lyashko Yu.V.[1], Medvedev D.V.[1], Medvedeva E.P.[1], Fedorets I.D.[2], Khlapova N.P.[2]
[1]*NSC "Kharkov institute Physics and Technology", Ukraine;*
[2]*V.N.Karazin Kharkov National University, Ukraine*
E-mail: ndikiy@kipt.kharkov.ua

On the example of a model system of methanol the conversion influence of effects of γ-activation of nano ZrO_2- catalysts is investigated on their functional characteristics in the processes of heterogeneous catalysis. Influence of γ–activated nanopowder ZrO_2 on direction and reaction yield was controlled up on the series of experiments at room temperature with ZrO_2 in their initial and the γ-activated state. Activating of samples was carried out by bremsstrahlung on high-current electronic accelerator in NSC KIPT at energy of electrons 22 MeV and a current 500 μA. The features of structural transformations in γ-activated ZrO_2 were researched the method of *X*-ray diffractometry. It was shown that in the structure of ZrO_2 no essential changes and γ-activated particles of oxide keep monophase state and crystallinity of the initial state. Catalytic activity of ZrO_2 before and after their γ-activated was estimated on the absorbency of products of conversion reaction of methanol on the spectrophotometer of SF-46. The found out the sharp increase of activity of ZrO_2-catalystes after their γ-activated is ascribed to *synergy* of factors of ionizing radiation - big ionization losses of Auger electrons near a surface ZrO_2 nanoparticles from ^{89}Zr - and influences of high-reactionary formations of heterogeneous catalysis.