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Biography

Robert Barthos has completed his PhD degree from the University of Szeged, Hungary in 2002. He is a Senior Research Associate at the Research Centre for Natural Sciences, Hungarian Academy of Sciences. His field of research interest includes heterogeneous catalysis, especially preparation, characterization, and catalytic testing of solid oxides. His 26 publications were cited 657 times. His publication h-index is 14.

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CONVERSION OF ETHANOL TO BUTADIENE OVER MGO-SIO_2 CATALYSTS

Ethylene is generally produced by thermal cracking of naphtha in the process involving a complex network of radical reactions resulting in a broad product distribution. The 1,3-butadiene, needed to rubber manufacturing, is obtained as by-product of the process. As a recent development, the oxidative dehydrogenation of ethane is getting to become the prevailing ethylene production technology, resulting in shortage on the butadiene market. Alternative, environmentally friendly butadiene production technologies are sought for the production of 1,3-butadiene from biomass-derived feedstock, such as bioethanol, attracts increasing academic and industrial interest. The transformation, leading from ethanol to butadiene must involve consecutive reactions, such as, dehydrogenation, hydrogenation, C-C coupling, and dehydration. Our research is focused on the catalytic mechanism of this complex transformation. The reaction was tested over three MgO-SiO_2 catalysts, such as, natural and synthetic talc and a preparation, obtained by wet-kneading MgO precipitate and SiO_2 nanopowder. The MgO-SiO_2 material was doped by ZnO, In_2O_3 or Ga_2O_3 and the effect of doping on the product selectivity was investigated. The oxide catalysts were characterized by NMR and XPS methods. The surface basicity of the catalysts was probed by CO_2 adsorption, determined by temperature-programmed CO_2 desorption method. Our presentation will discuss the effect of catalyst structure and basicity on the reaction pathway and product yield in the ethanol-to-butadiene reaction.

Note: