Abstract Doctoral dissertation

„Isomerization of α-pinene on synthetic titanium-silicate catalysts and porous materials of natural origin”

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Terpenes are a natural alternative to organic compounds obtained by a chemical synthesis from petroleum-derived raw materials. The biological activity of terpenes makes them find very numerous applications in medicine and cosmetics. Also, derivatives of terpenes, obtained by a modification of their structures, find numerous applications as biologically active compounds used in modern therapies in medicine or are used in new cosmetic preparations. An example of the terpene with very valuable properties is α-pinene. A rich source of this compound is turpentine. In addition, it is obtained as a by-product in a paper production. One of the pathways for the transformation of terpenes (including α-pinene) is the isomerization reaction, which takes place in the presence of a suitably selected heterogeneous catalyst. In order to obtain the desired isomerization products of α-pinene, it is aimed to obtain catalysts that are environmentally friendly, selective, inexpensive to produce, thermally and chemically stable and regenerable.

The present doctoral dissertation entitled. "Isomerization of α-pinene on synthetic titanium--silicate catalysts and on porous materials of natural origin" presents research on new catalysts used in the isomerization of α-pinene. The dissertation presents ways to obtain synthetic titanium-silicate catalysts with different titanium contents, such as Ti-SBA-15, Ti-MCM-41, TS-1, and it also describes ways to prepare catalysts obtained by the modification of natural clinoptilolite and commercial DT0 carbon. In the dissertation, the physical and chemical properties of the obtained porous materials were described in detail, and their activity in the isomerization of α-pinene was examined. The most active catalyst from each group of examined catalysts, was used to determine the most favorable conditions for the α-pinene isomerization for each group of catalysts.

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