



COMMERCIAL CATALYSTS FOR ECOLOGICAL CATALYSIS

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Nitrogen oxides (NO_x) are undesired products of any fuel burning both on stationary and mobile objects. Selective catalytic reduction of nitrogen oxides with hydrocarbons in excess of oxygen is one of perspective ways of their removal from exhaust gases. Therefore at present days a lot of attention is given to the development of catalysts for this process.

The most effective deNO_x catalysts contain noble metals such as Pt or Pd, which are rather expensive. The development of considerably cheaper and accessible catalytic systems based on transition metal oxides, which will be comparable with previously mentioned catalysts for deNO_x is a major task for the future of ecological catalysis.

The purpose of this work was the investigation of manganese-cement catalytic systems NTK-10-7F (Cu-Zn-Mn-Al-Ca), GTT (Cu-Ni-Mn-Al-Ca) and Mn-Al-Ca developed in Novomoskovsk Institute of Nitrogen Industry (NINI) in deNO_x reaction in the presence of oxygen and propane. The catalytic systems based on especially clean cements with high specific surface area, high mechanical durability, thermal stability, and ecologically friendly ways of their production.

Mn-cements catalysts with the various manganese oxide loading were tested in selective reduction of NO_x by propane at presence O₂ was in fixed-bed reactor at temperatures 150 - 550°C with GHSV = 10000 h⁻¹.

It was shown, that the maximal oxides conversion in a specified reaction was achieved on NTK-10-7F and Mn-Al-Ca catalysts within 400-500°C temperatures range. The activity of catalysts NTK-10-7F increases simultaneously with the increase of Mn oxide loading from 0,25 up to 26 mass. %.

Therefore the industrial catalysts NTK-10-7F and Mn-Al-Ca based on very clean high-alumina cements developed in NINI for the cleaning of waste gases from toxic organic compounds purposes, are also perspective in exhaust gases deNO_x by the oxidation of gaseous hydrocarbons.