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INFLUENCE OF RADIATION MODIFICATION ON CATALYSTS' ACTIVITY BASED ON NATURAL CLINOPTILOLITE IN THE TOLUENE HYDROGENATION

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In this work research of influence of radiation modification on conversion's degree of toluene at presence of natural clinoptilolite, which was modified by ions of Co, Mo, Ni-So, Ni-Mo (2 mass %) and supported on Al_2O_3 and bentonite in a temperature interval about 100-200 °C is carried out. It is shown that conversion's degree doesn't exceed 40% at presence of zeolite-containing systems both on aluminum oxide and bentonite promoted by cobalt and molybdenum. Electronic irradiation dose of 100 MRad under argon flow increases catalysts' activity. For unirradiated sample toluene conversion is increased from 40% to 60% for the catalysts passed preliminary irradiation by an electron beam. Additional injection of 2% Ni in Co- and Mo-containing catalysts leads to 100% conversion's degree of toluene. 100% toluene conversion on radiation modified Ni-Co-zeolite-containing catalyst, which is put on oxide of aluminum, are reached under softer conditions in comparison with Ni-Mo-containing sample. Less noticeable effect of radiation modification on conversion's degree of toluene is observed on zeolite-ontaining samples applied on bentonite. The received regularities on influence of the carrier's nature (bentonite and aluminum oxide) on conversion's degree of toluene at presence of Ni-Co- and Ni- Mo- zeolite-containing catalysts are possibly caused by fact that short-term radiation thermal processing of aluminum oxide doesn't lead to change of structure of an active surface. According to [1] short-term radiation thermal processing of aluminum oxide doesn't lead to change of the Lewis acid centers' concentration on a surface of aluminum oxide while it decreases on bentonite under the same conditions of radiation processing.

References:

1. Solovetsky Yu.I., Markaryan G. L., Lunina E.V., Ryabchenko P.V., Seleznyov Yu.L. Catalysts' radiation thermal processing of sulphur production in Claus process // Kinetics and Catalysis. – 1994. – T. 35, № 2. – Page 311-313.