Catalytic reaction based on mesoporous molecular sieve. Oxidation based on Mn-MCM41 catalysts.

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Ordered mesoporous molecular sieves were synthesized and illustrated for the first time in the literature beginning with 1969. Due to the characteristic methods lightly evaluated at that time, the remarkable proprieties of this material were not fully accepted.

In 1992 was synthesized a material cu special proprieties, by the researches of Mobil Oil Corporation, creating the premises for a great research domain.

In the actual period a series of publications present different aspects related to the mesoporous molecular sieves as: synthesis, modification of the surface and their one action in catalysis.

The main advantages in utilization of the MCM-41 as catalysts are represented by its special geometrical and chemical properties. Distinguished by the crystalline zeolites, the amorphous walls of SiO_2 from mesoporous molecular sieves allow the isomorphous substitution of silica ions with others in the matrix without changing his structure.

The studies presented in this thesis have as principal scope the development of a synthesis process for the catalysts such mesoporous molecular sieves and their capacity to control the oxidation reaction of ethyl benzene.

The subject of this thesis contoured it self in the actual thematic of synthesis of new catalytic materials used in selective oxidation reactions, materials which can present a higher conversion and a greater selectivity for the wanted product and which can keep its catalytic properties in time.

The concept standing on the base of this experimental study involves the incorporation of some metals in molecular sieves like MCM-41 which can influence the catalytic activity in different types of reactions. The manganese is one of the incorporated metals in the mesoporous molecular sieve and is used in the oxidative reaction of ethyl benzene.

The content of this thesis is presented in a series of steps which highlight the synthesis of manganese catalysts on mesoporous molecular sieves like MCM-41 and the testing of

catalytic performances correlated with their activity and selectivity in the oxidative reaction of ethyl benzene.

Therefore, the first part of the thesis presents the method for catalysts synthesis such Mn-MCM-41 with ordered structure, higher specific surface, who posses an optimum catalytic potential for their utilization in the oxidative reaction of ethyl benzene.

The second part was attributed to the characterization of synthesized catalysts and in the last part it was studied the performances of these catalysts in the process of selective oxidation of ethyl benzene.

Mesoporous materials such Mn-MCM-41 were successfully prepared using the hydrothermal method by isomorphous substitution of the silica ions from the matrix of MCM-41 with ions of manganese. Furthermore is noticed that in the cases of Mn-MCM-41 catalysts, the pore diameters can be modified by modification of the length of the carbon atomic chains included in the molecule. The incorporation of manganese in a series of different mesoporous molecular sieves, with different weight of the pores, influence in a positive way the catalyst performances in the selective oxidation reaction of ethyl benzene.

The experimental study was based on a higher numbers of investigations, which allowed obtaining of reliable results, detailed in the fifth chapters of this thesis. The proposed subject led us to a series of important results and conclusions in order to improve the catalytic performances of Mn-MCM 41 in the selective oxidation reaction of ethyl benzene. The concrete results obtain in this thesis create premises for extension and development of this researching topic.