NANOCATALYSTS PREPARED BY ENCAPSULATION OF MANGANESE(III) COMPLEX INTO NAY ZEOLITE

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Zeolites have crystalline structures constructed with SiO_4 and AlO_4 tetrahedra linked through oxygen bridges. Zeolite structures contain with uniformly sized pores and channels [1] due to that only active component with a proper size and shape can be incorporated. In addition, the negative charge of the zeolite framework and the distribution of the dynamic metal cations can lead to specific interactions with the zeolite framework [2]. The encapsulation/immobilization of complexes inside these structure lead to important heterogeneous catalysts. These catalysts are interesting for application as biomimetic heterogeneous catalysts for the oxidation of alkanes, alkenes and alcohols. In earlier studies, our group shows that the methodologies used for the *in situ* encapsulation of the metal complexes in zeolites play an important role in the catalytic activity of these heterogeneous catalysts [3,4].

Manganese(III) *Salen* complex was encapsulated into NaY zeolite, using two methodologies namely flexible ligand method (A) and complex synthesis *in situ* (B). The characterization of free complex as well as catalysts with and without complex encapsulated was made using standard techniques. DFT calculations support the assumed molecular structure and electronic properties of the complexes.

Both catalysts were evaluated in oxidation of olefins using tert-butyl hydroperoxide as oxygen source. The blank reaction leads to neglecting substrate conversion, proves the catalytic activity of encapsulated complexes. Both catalysts show significant substrate conversion. In general, reaction proceeds faster in the presence of material obtained by method (A). Both heterogeneous catalysts were characterized after the last catalytic cycle and any changes in zeolite structure were detected.

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