CATALYTIC OXIDATION OF HETEROCYCLIC KETONES BY HYDROGEN PEROXIDE AT PRESENCE OF Cu(II) AND Fe(III) POROUS COORDINATION POLYMERS

Abdullaev E. N.[1], Kolosov M. O.[2], Shvets E. H.[2], Mishura A. M.[1], Gavrilenko K. S.[3,4], Kolotilov S. V.[1]

[1]L. V. Pisarzhevskii Institute of Physical Chemistry of the NAS of Ukraine, Kiev, Ukraine

[2]V. N. Karazin Kharkiv National University, Kharkiv, Ukraine

[3]Enamine Ltd, Kiev, Ukraine

[4]ChemBioCenter, National Taras Shevchenko University of Kyiv, Ukraine

abdullaev.emir99@gmail.com

Porous coordination polymers (PCPs) of 3d metals can be considered as promising heterogeneous catalysts for oxidation reactions, especially for fine organic synthesis. A distinctive feature of the use of such catalysts is a possibility to perform the reactions under conditions of heterogeneous catalysis (including using a flow reactor), that significantly simplifies the separation of the catalyst from the reaction mixture and the purification of the product itself. Determination of the factors which make influence on the catalytic activity of such systems is an important task of modern physical chemistry.

The aim of this work was to evaluate and to compare catalytic activity of PCP $Cu_3(btc)_2$ (known as HKUST-1; btc^{3-} is 1,3,5-bensenetricarboxylate) and $Fe_2(OH)_3(btc)$ in reaction of heterocyclic ketones oxidation by hydrogen peroxide. The ketones and some oxidation products are shown on Fig. 1.

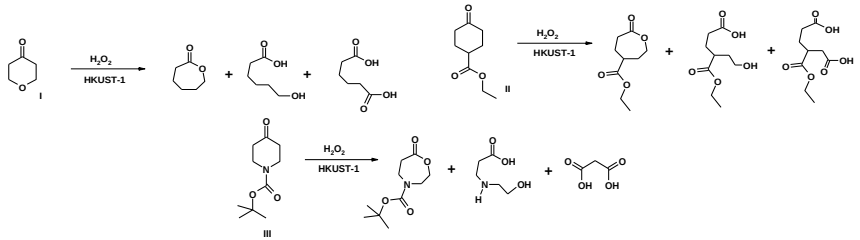

Fig. 1. Schemes of reactions studied

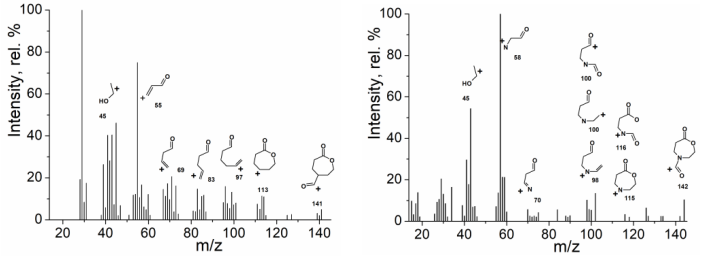

Fig. 2. Mass-spectra (EI, 70 eV) of the oxidation products of **II** (a) and **III** (b)

Reaction products were determined by NMR and HPLC, separate experiments on mass spectrometry were carried out. It was shown that in all cases the mixtures of products were obtained. These mixtures contained lactones, formed by the Bayer-Villiger mechanism, and other compounds, presumably formed as a result of the radical oxidation.