IV INTERNATIONAL CONFERENCE

# Nanobiophysics 2015: Fundamental and Applied Aspects

To the memory of Prof. Valery Kharkyanen

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BOOK OF ABSTRACTS

**Schiff bases complexes immobilized at nanosilica as catalysts in ozone decomposition**

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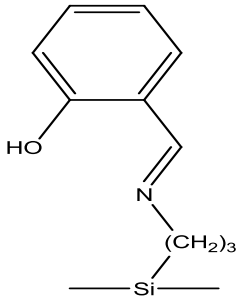
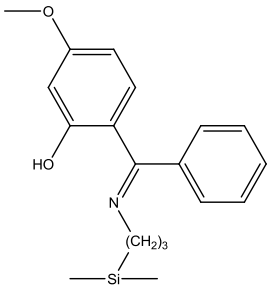
The influence of Mn(II), Co(II), Cu(II), Zn(II) and ligands, L1 and L2 (Fig) on nanocatalysts catalytic activity in ozone decomposition reaction were studied. The immobilization of a ligand and a complex formation were proved by IR and UV-VIS spectroscopy. When the complex is formed it shifts $\nu_{C=N}$ band in IR spectra to shorter wavelengths. The shift of $\nu_{\pi-\pi^*}$ band in UV-VIS spectra is also an evidence for a metal coordination. The half time of ozone decomposition (the bigger the better) is an evaluation parameter of complex activity. The influence of a central atom on catalytic activity of a mono complex could be represented as follows:




L1




L2

Fig. Ligands L1 and L2 immobilized on nanosilica surface

$Mn(L1)_2 > Co(L1)_2 > Cu(L1)_2 > Zn(L1)_2 > L1$ (I);

$Mn(L2)_2 > Co(L2)_2 > L2 > Cu(L_2)_2 \approx Zn(L2)_2$ (II).

The complexes with L1 are more active than complexes with L2. In addition, catalytic activity of immobilized ligand is different for L1 (I) and L2 (II). Bimetal complexes [Mn-M'-L1] and [Mn-M'-L2] (M' – Co, Cu, Zn) were synthesized by cooperative adsorption of two metals in equal concentrations. The catalytic activity of bimetal complexes could be represented as follows: $Mn(L1)_2$ > [Mn-Co-L1] > [Mn-Cu-L1] > [Mn-Zn-L1] (III) [Mn-Cu-L2] > [Mn-Co-L2] > [Mn-Zn-L2] > $Mn(L2)_2$ (IV)

The dependence of catalytic activity for L1, line I and III, is the same for mono- and bimetal complexes. The less an activity is of the second metal, the lower activity is of the bimetal complex. In case of $L_2$ the second metal M' = Cu(II), Co(II), Zn(II) increase catalytic effect of Mn(II) and besides in backward line II sequence. The close relations could be expected for bioactivity of complexes.