

## Nanocomposites and nanomaterials

### Structure formation in silica-polymer system by the synthesis of organic-inorganic composites with enzyme activity by sol-gel method

V.V.Payentko<sup>1</sup>, A.K.Matkovsky, Yu.V.Matrunchik<sup>2</sup>

<sup>1</sup> *Chuiko Institute of Surface Chemistry of National Academy of Sciences of Ukraine* 17 General Naumov Str., Kyiv, 03164, Ukraine,  
E-mail: [alexender.matkovsky@mail.ru](mailto:alexender.matkovsky@mail.ru)

<sup>2</sup> The Institute of General and Inorganic Chemistry, National Academy of Sciences of Belarus, 9/1 Surganov Street, Minsk BY-220072, Republic of Belarus

Immobilization of ferments by inclusion in polymeric shell created the effect near to in vivo, but unfortunately polymers are unaligned to bactericidal influence. Using for these purpose hybrid organic-inorganic composites give additional advantage connected with double protection of enzymatic preparation from bad effect of environment on it.

The grounds of crating such systems provide for study of factors affected on their formation, that what in subsequent development will permit to obtain materials with certain characteristics previously[1] it was been shown by us that pore structure of silica constituent is slightly dependent on the nature of polymer in composite, but on the value of pH sole-gel process.

Nevertheless, the catalytic activity of enzymatic preparation essentially depends on the nature of polymer used as the shell. This is connected with providing substrate transport to active site on defensibility determined by interactions silica-polymer and polymer-enzymatic preparation.

The goal of present work was to study the structure formation in silica-polymer system during sole-gel process by viscosimetry method. The following polymer were used in the work: polyvinyl alcohol and gelatine with molecular mass 40000, 95000 and 10800, 46500 accordingly. The carrying out of measurements were realized by viscosimeter Brookfield DV-II+PRO permitted to define dependence of viscosity value on shearing stress value( under the same

values of shearing rate).

So the catalytic indices of enzymatic preparation may be o by using as shells not only polymers different nature, but also their molecular mass and relationship.

1. Payentko VV: **Preparation of composites based on silica, gelatin and homogenate of the liver of Gallus gallus by sol-gel method.** *Chem Phys Technol Surface* 2012, **3**(1):108-13