

The Influence of Structure Formation of the Silica Matrix on the Activity of Immobilized Cholinesterase

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Inclusion of ferments in hybrid organic-inorganic materials permit to obtain active immobilized preparation, since the polymer consisted in system creates the effect near to in vivo and silica matrix preserve biopreparation relative the influence environment. The dependence of the properties of composite material on the way of obtaining of silica constituent part was found by us previously [1] structure of the last may provide for different location of enzyme introduced into polymeric shell.

The goal of present work is to set up influence factors on aggregation of silica particles as the main reason (cause) of high cholinesterase activity of enzyme including composite material.

Microphotographs of materials obtained by drying suspensions of A300/water (A) and A300/phosphate buffer from scanning electron microscopy(SEM) are shown on Fig.1

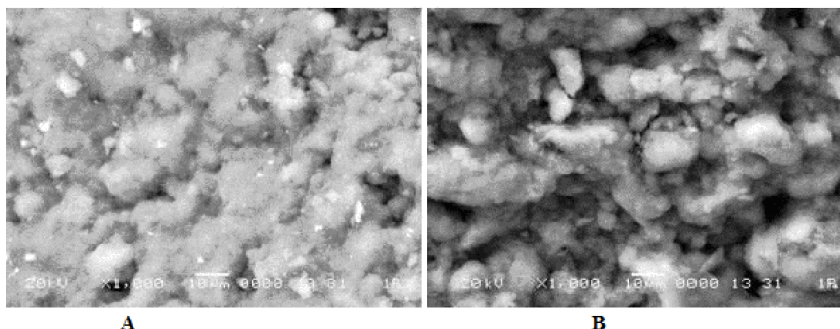


Fig.1.SEM-microphotographs of powder-like materials obtained by drying suspension of A300/ water (A) and A300 /phosphate buffer

Similar results were obtained for systems silica\polyvinyl alcohol and silica\ gelatine. In the case of using polymers with higher molecular mass, the textures of surfaces were less aggregated. Activity of obtained preparations was higher under the less values of molecular mass as result of aggregation silica particles.

These results are in agreement with data of cholinesterase activity of composites obtained of sol-gel method.

Quantum-chemical calculation of charges distribution in the systems under investigation (A300/ water (A) and A300 /phosphate buffer).

1. Payentko V.V., Matkovsky A.K., Matrunchik Y.V. Composites of silica with immobilized cholinesterase incorporated into polymeric shell/Режим доступу/<http://www.nanoscalereslett.com/content/10/1/82>