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GLUCOSE OXIDASE – VANADIUM SUBSTITUTED ANIONIC CLAY AS BIONANOCOMPOSITE FORMULATIONS FOR BIOSENSORS APPLICATIONS

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Abstract

Chemical sensors utilizing immobilized enzymes and proteins are important for monitoring chemical processes and biological systems. Glucose oxidase (GOx) from *Aspergillum Niger* is a flavoenzyme that has been used to determine glucose. Among the conventional methods of enzyme deposition the main strategy consists in its entrapment in an inert matrix adsorbed on the electrode surface. We report here the synthesis and physical – chemical characterization of a new bionanocomposites obtained by entrapping GOx in the vanadium substituted layered double hydroxides layered matrices. Two synthesis methods were used for obtaining the clay – enzyme biohybrid: the direct synthesis by coprecipitation method and the reconstruction method of partially substituted vanadium clay. The XRD and FTIR analysis indicate that the structural features of the enzyme - LDH biohybrid is dependent on the synthesis method; SEM results points out the formation of well crystallized particles with an average diameter equal to 90 nm. The particular electrostatic features of vanadium substituted clay are able to give rise to specific characteristics of GOx - VLDH composites.

Key words: anionic clay, glucose oxidase, layered double hydroxides, vanadium

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