عنوان مقاله:

Immobilization of glucose oxidase by entrapment within growing polymeric layers of polyacrylamide-grafted silica nanoparticles

محل انتشار:

اولین کنگره پزشکی شخصی (سال: 1395)

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خلاصه مقاله:

Glucose oxidase (GOX) plays important role in the development of biosensors, in addition to its widespread applications in food industry. Immobilization of GOX can provide increased resistance to the variations in operational conditions such as pH and temperature. Different approaches have been used to immobilize GOX in nanostructured materials, due to their high surface area. In this work, we report immunization of GOX by the entrapment in surface confined polyacrylamide. GOX was immobilized by entrapping within growing polyacrylamide chains in silica-polyacrylamide core-shell nanoparticles. The core-shell nanoparticles were prepared by the grafting from polymerization of acrylamide on the surface of silica nanoparticles through surface-bound azo initiators. The products were characterized FTIR spectra, thermal analysis, high resolution transmission electron microscopy (HRTEM) and scanning electron microscopy (SEM). The catalytic activity and stability of the immobilized enzyme was compared with free enzyme. It was found that the storage stability study showed that the immobilized GOD retained 50% of its initial activity after 42 days and 60% of the activity was also remained after 16 repeated uses and also 10% initial activity remained after 22 cycles. Considerable enhancements in thermal stabilities were observed for the immobilized GOD at elevated temperatures up to 80 C and the activity of immobilized enzyme was less sensitive to pH changes in solution.

کلمات کلیدی:

silica nanoparticles, immobilization, core-shell, glucose oxidase