



Preparation of Core-Shell ZnO-SiO₂ Nanowires-Nanotubes for Immobilization of the Alkaline Protease Enzyme

Authors: Sadjadi, M.S.; Farhadyar, N.; Zare, K.

Source: [Journal of Nanoscience and Nanotechnology](#), Volume 11, Number 10, October 2011 , pp. 9304-9309(6)

Abstract:

The main goal of enzyme immobilization is industrial re-use of enzymes for many reaction cycles. In this purpose, simplicity and improvement of the enzyme properties have to be strongly associated with the design of protocols of enzyme immobilization. In the last decade, nanosized materials have been widely used as a support for enzyme immobilization, for instance, silica nanotubes, phospholipid bilayers, self-assembled monolayers Langmuir-Blodgett films, polymer matrices, galleries of α -zirconium, phosphate, mesoporous silicates such as MCM-41, silica nanoparticles. In this work, we report synthesis of core shell ZnO/SiO₂ nanowires and used them as a support for immobilization of the alkaline protease. Characterization of this assembled systems was carried out by, Energy-dispersive X-ray spectroscopy (EDAX), Transmission electron microscopy (TEM) and Scanning electron microscopy (SEM). Biocatalytic activity of the alkaline protease in this bioconjugate system was examined and the results showed an increase of biocatalytic activity, in comparison with the free enzyme in solution.

Keywords: [CORE-SHELL ZNO/SIO₂](#); [ALKALINE PROTEASE](#); [BIOCATALYTIC ACTIVITY](#); [BIOCONJUGATE MATERIALS](#)

Document Type: Research article

DOI: <http://dx.doi.org/10.1166/jnn.2011.4312>

Publication date: 2011-10-01