

An enzyme-nanofiber composite for enzyme stabilization

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We constructed an enzyme-nanofiber composite in which enzyme was stable. This study will show the preparation and application of enzyme-nanofiber composites. The enzyme-nanofiber composite was prepared by coating enzyme-aggregate on the surface of nanofibers. The esterase from *Rhizopus oryzae* was used to construct this biocatalytic nanofibers. The activity and stability of the enzyme-nanofiber composite was measured by using 4-nitrophenyl butyrate as substrate dissolved in N,N-Dimethylformamide (DMF). It was found that immobilized enzyme on nanofibers was highly stable even under shaking condition, preserving 80 % of the initial activity for 80 days. Repeated usages of this enzyme-nanofiber composites seem to be very promise. The enzyme-nanofiber composite was repeatedly used for 30 cycles for enzymatic substrate hydrolysis and the immobilized enzyme still remained to be highly active even after 30 cycles. The enzyme-nanofiber composite allowed an economically feasible enzyme system for costly enzymes with potential applications in food production, pharmaceuticals application and bioremediation process.