

Basic characteristics of cellulase immobilized on lignophenol

ABSTRACT

Enzymatic hydrolysis of cellulosic biomass by cellulase has been receiving attention. Since the cost of cellulase has a big impact on the price of the products, it is important to develop cheaper alternatives. Here we report on the production of a novel immobilized cellulase. A functional lignin-based phenolic polymer “lignophenol” (p-cresol type : ligno-p-cresol) was synthesized from Hinoki wood meal and p-cresol through the phase separation system developed for selective separation of lignocellulosic components. Commercial cellulase derived from *Trichoderma reesei* was easily immobilized on lignophenol simply by mixing to give water-insoluble cellulase-lignophenol complex. Immobilization reached more than 100 mg/g-lignophenol with an enzymatic activity of about 60% compared to free cellulase. With lower immobilization loads, cellulase exhibited lower activity. Cellulase did not significantly detach from lignophenol by mixing with acetate buffer, indicating that the cellulase immobilized by a simple physical adsorption is stable.

Keyword: Cellulase; Lignophenol; Immobilized Enzyme; Physical adsorption; Enzymatic hydrolysis