Biochemical characterization of immobilized candida rugosa lipase by using sodium alginate as carrier

林延龍、張淑微、吳建一

E-mail: 322081@mail.dyu.edu.tw

ABSTRACT

The enzyme immobilization can be used to retain its activity, improve thermostability and provide the reuse ability for continuous and automatic industrial applications. In this study, we planned to develop a new immobilized carrier for Candida rugosa lipase with high catalytic activity for various industrial applications. The results showed the catalytic activity of enzyme immobilized on sodium alginate (0.288 U/g) was 2-fold higher than that seen using the bentonite as a carrier. These results indicated that sodium alginate is a preferred carrier for immobilizing C. rugosa lipase. In addition, we investigated the effect of alginate concentration and CaCl2 concentration on the immobilization efficiency and evaluated the properties of immobilized enzyme. The results showed that the optimum alginate concentration for lipase immobilization is 6%. The optimal pH and temperature for the immobilized lipase were 7 and 50 ℃, respectively. The immobilized lipase was stable at pH 5 and 40 ℃. It was observed that the immobilized lipase stored at 4 ℃ and 30 ℃ for 30 days saved at least 90% and 80% of their initial activities, respectively. The surface morphology of Ca-alginate beads was also investigated in this study. The results showed that the matrix structure of microspheres prepared at high alginate concentration was much denser.

Keywords : Alginate、Bentonite、Candida rugosa lipase、Entrapment、Immobilization、Optimizatio

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