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Effect of enzyme concentration and temperature on the immobilization of cyclodextrin glucanotransferase (CGTase) on hollow fiber membrane

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Abstract

Cyclodextrin glucanotransferase (CGTase) is a multifunctional industrial enzyme, which undergoes cyclization reaction to convert starch into cyclodextrin (CD). However, the instability of the enzyme during the reaction process results in the low production of CD. Immobilization process has been proven as a promising method to improve the enzyme stability in order to achieve the high production of CD. In this study, the CGTase from *Bacillus licheniformis* was immobilized on polyvinylidene difluoride (PVDF) hollow fiber membrane by adsorption. The effects of the enzyme concentration [0.6-1.4% (v/v)] and temperature (20-40 °C) on the immobilization yield were investigated. The highest immobilization yield of 80.0% was observed when 10% (v/v) of enzyme concentration was used. The optimal immobilization temperature obtained was at 25 °C with 95.6% of immobilization yield. Hence, the high immobilization yield contributed to the high production of CD which may be beneficial for the industrial purposes.