

Immobilization Strategy of Recombinant Xylanase from *Trichoderma reesei* by Cross Linked Enzyme Aggregates

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Abstract—Modern developments in biotechnology have paved the way for extensive use of biocatalysis in industries. Although offering immense potential, industrial application is usually hampered by lack of operational stability, difficulty in recovery as well as limited re-use of the enzyme. These drawbacks however can be overcome by immobilization. Cross-linked enzyme aggregates (CLEAs), a versatile carrier-free immobilization technique is one that is currently capturing global interest. This approach involves precipitating soluble enzyme with an appropriate precipitant and subsequent crosslinking by a crosslinking reagent. Without ineffective carriers, CLEAs offer high enzymatic activity, stability and reduced production cost. This study demonstrated successful CLEA synthesis of recombinant xylanase from *Trichoderma reesei* using ethanol as aggregating agent and glutaraldehyde (2% (v/v); 100 mM) as crosslinker. Effects of additives including proteic feeder such as bovine serum albumin (BSA) and poly-L-Lysine were investigated to reveal its significance in enhancing the performance of enzyme. Addition of 0.1 mg BSA/U xylanase showed considerable increment in CLEA development with approximately 50% retained activity.

Keywords—Cross-linked, immobilization, recombinant, xylanase.

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