

Partial purification and characterization of the trehalose synthase from a noval recombinant *Picrophilus torridus* R523P

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ABSTRACT

Trehalose is a new multi-functional disaccharide, it exists in many nature body, not only as a reserve energy and carbon source, but also help resist harsh environment, and has the ability to stabilize biological macromolecules, trehalose is widely applied in the food, cosmetics and pharmaceutical industries. Trehalose synthase is one of the pathways employed organism to synthesize trehalose. It catalyzes the reversible conversion of maltose into trehalose by intramolecular transglucosylation. This study using a new recombinant *Picrophilus torridus* trehalose synthase (PTTS) mutant R523P, analyze the biochemical properties. Thermal stability for enzyme purification, enzyme kinetics, temperature (20 -65) and pH(3-8) values for trehalose conversion rate. Experimental results show that this enzyme (R523P) at 40 , the reaction of 4 hours, pH6, its conversion rate of trehalose in PTTS-wild type to 50.58 ± 0.67%, and by product of glucose reduction in the 7.92 ± 0.06%. Stability in the temperature, 70 still maintain the 94.31 ± 0.0135% of relative activity. The pH stability, when the pH reached 8, the relative activity of 62.49 ± 0.61% also maintain and expand the reaction range of pH. In this study, pointed out that the mutant enzyme (R523P) reduce glucose produced and expand the scope of the reaction conditions. This suggests in its future industry and raise the production of trehalose would be of great potential.

Keywords : Trehalose、*Picrophilus torridus*、PTTS、mutant、thermostability

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