ABSTRACT

Glucoamylase was produced by *Arachniotus citrinus* on wheat bran (fine particles) under solid state growth conditions. Crude extract of glucoamylase contained 16.7U/mg of proteins.

Glucoamylase was purified by ammonium sulfate precipitation, ion-exchange chromatography and Hydrophobic interaction chromatography on FPLC system. Glucoamylase were purified to 9.4 fold with 42.96% of recovery.

Metals like (Mn²⁺, Ca²⁺ and Zn²⁺) with a concentration of 5mM, were applied to determine their effect on irreversible thermal stability of glucoamylase. Native enzyme was completely destroyed at 62°C with half life of 16.66min. Attachment of Mn²⁺ stabilized the enzyme with half life of 31min. Ca²⁺ stabilized the enzyme more than Mn²⁺ because with Ca²⁺ enzyme showed activity at 80°C with 462 min. $t_d$ (doubling time).

Zn²⁺ was the best metal due to its stabilizing effect. It stabilized the enzyme at 100°C with 2626 $t_{1/2}$. Thermodynamic studies also supported Zn²⁺ stabilizing capability. $\Delta G^*$ of native enzyme at 62°C was 102.44 and $\Delta H^*$ was 245.97 kJ/mol. While $\Delta G^*$ and $\Delta H^*$ with Zn²⁺ attachment at 100°C were 130.32 and 44.39kJ/mol respectively. Higher values of $\Delta G^*$ and $\Delta H^*$ showed high stability. Low values of $\Delta S^*$ represent high stability i.e the orderness of active site.