Abstract

With an increasing demand of an alternative source of energy to run industries and transportations, thermostable cellulases are considered to be important enzymes for the saccharification of cellulosic material. β-glucosidase is an essential enzyme which belonged to cellulases and plays a key role in the degradation of cellulosic biomass. In the current research course, cloning, purification and characterization of β-glucosidase was carried out from *Thermoanaerobacterium thermosaccharolyticum* into *E.coli*. β-glucosidase gene from thermostable *Thermoanaerobacterium thermosaccharolyticum* was cloned in pET-21a(+) vector and expressed in *E.coli* BL21. An intracellular β-glucosidase protein displayed a single band of molecular weight 51.6 kDa on SDS-PAGE after two step purification. Effect of temperature, pH, metal ions, organic solvents and inhibitors was analyzed on the purified enzyme. Purified enzyme displayed maximum activity at pH 7 and temperature 80°C. Enzyme activity was not much affected by Fe^{2+} and Mn^{2+} while Na^{+} and Cu^{2+} metal ions inhibited enzymatic activity. There was no remarkable change in enzyme activity when enzyme was treated with organic solvents. All these significant properties make β-glucosdiase an industrially important candidate for useful biological processes.