Abstract

Thermostable xylanases are in huge demand because of their vast applications at industrial level. Xylanases by breaking xylan plays important role in catalysis of lignocellulosic biomass. Xylanases have many applications, from the production of biofuel to deinking of paper and pulp. From thermophilic *Thermoanaerobacterium thermosaccharolyticum* DSM 571, thermostable xylanase gene T-the0992 was cloned and expressed into *E.coli* BL21 codon plus using plasmid pET21a(+). Gene encoding 413 amino acids was translated into a protein having molecular weight 45.5 kDa. Purification was carried out by heat treatment and Ni-TED affinity chromatography. Purified enzyme displayed maximum activity at 70 °C temperature and pH 6.5. Enzyme showed stability at wide range of pH i.e. 5.5-7.5. Metal ions Zn^{2+}, Cu^{2+} and Na^{2+} inhibited enzyme activity significantly whereas enzyme activity slightly decreased in the presence of Mg^{2+}, Ca^{2+} and Fe^{2+}. Organic solvents showed no significant effect on enzyme activity. SDS, Triton X200, Tween80 inhibited enzyme activity but it was not get affected much by EDTA presence. In case of 1% SDS residual enzyme activity was measured to be 20.09%±1.52. Thermostability, pH stability and other significant properties make this β-xylanase a potential candidate for industrial applications.