Abstract

Purification and characterization of β 1, 4- exoglucanase using [illegible] gene from *Thermotoga petrophila* was carried out in this research. Crude enzyme [illegible]ed after 24 h of submerged fermentation at 37°C and 200 rpm yielded enzyme activity of (13.07±0.05 U/mL/min) and total protein content as (1.59±0.05 mg/ml). Ammonium sulphate precipitation and anion exchange chromatography applying DEAE-Cellulose column were used respectively to attain the purity of enzyme which resulted in 28% yield and 2 fold purification with the increase in specific activity of (25.9±0.05 U/mg). Kinetic characterization of an enzyme revealed pNPC (p-nitrophenyl-β-D-cellobioside) as highly specific substrate for an enzyme with K_m value of 4.6mM. Thermodynamic studies of an enzyme revealed activation energy (E_a) and enthalpy of activation (ΔH) as 15.12KJ/mol, 12.87KJ/mol respectively. Optimum pH and temperature for catalytic activity of an enzyme were found to be pH 6 and 90°C respectively. The activity of an exoglucanase was studied in the presence of metal ions, surfactants, organic solvents and EDTA. Catalytic activity was hindered in the presence of Co^{2+}, Mg^{2+}, Zn^{2+}, Ca^{2+} and Pb^{2+}. Chelating agent (EDTA) also decreased the activity of an enzyme.