ABSTRACT

An extracellular, soluble and thermophilic cloned endo-1,4-β-xylanase from *Caldicellulosiruptor kronotoskyensis* was produced in *E. coli* BL21 CodonPlus by submerged fermentation using optimal medium ZYBM9 and growth conditions. After optimal production of recombinant enzyme, the crude enzyme was purified using cation exchange chromatography (CEC) technique after heat treatment (at 70°C for 1 hr) and ammonium sulfate precipitation (55-60%). The purified endo-1,4-β xylanase has 40 kDa molecular weight on 12% SDS-PAGE. Enzyme showed optimal activity at 80°C and pH 6.0 against 1% (w/v) beech wood xylan as a substrate, with specific activity of 765.3 U/mg. The purified enzyme was completely stable at 40°C to 80°C for 6 hrs, mainly at pH 6.0. Recombinant enzyme displayed high affinity with various substrates such as beech wood xylan, birch wood xylan, pNP xyloside, and CMC. Enzyme exhibited resistance against metallic cations, organic solvents, surfactants and EDTA. The endo-1,4-β xylanase with these prominent and noteworthy properties is a valuable biocatalyst that can applicable in various biotechnological and industrial processes including bioethanol production.