KAMONWAN MANPAKDEE : PURIFICATION AND CHARACTERIZATION OF XYLANASE FROM Streptomyces sp. 42-9. THESIS ADVISOR : ASSO. PROF. PAIROH PINPHANICHAKARN , Ph.D. 73 pp.

Extracellular xylanase was purified from Streptomyces sp. 42-9 by fractionating with 20-50% saturation of ammonium sulfate and consecutive chromatography on DEAE-Sephadex A-50 and Sephadex G-150 columns, respectively. The specific activity toward xylan was increased by approximately 35 folds with 38% recovery. The molecular weight of the purified enzyme estimated via gel filtration was 36,000 daltons and it showed purity to homogeneity on polyacrylamide gel electrophoresis. Analysis of the purified enzyme on SDS-polyacrylamide gel electrophoresis revealed a single prominent band with molecular weight of 28,000 daltons, the result suggested that the enzyme consisted of a single polypeptide.

The optimal temperature and pH for the enzyme activity were 65°C and 5.5 with acetate buffer, respectively. It was dramatically inhibited by Hg^{2+}, Cu^{2+}, Sn^{2+} and Cu^{2+} while Zn^{2+}, Fe^{2+}, Co^{2+}, Mg^{2+} and Mn^{2+} slightly affected the enzyme activity. However, certain sugars such as D-xylose and L-arabinose had no effect on enzyme activity. The K_m value of the enzyme for xylan was 0.57 mg/ml. The enzyme was stable to heat up to 55°C and to a broad pH range between 5-9.