Karinta, T., 2019, Expression of xilanolitic enzyme recombinant in mix culture using lactose and galactose inducers ,. This thesis is under guidance of Prof. Dr. Ni Nyoman Tri Puspaningsih, M. Si. and Drs. Sofijan Hadi M.Kes., Departement of Chemistry, Faculty of Science and Technology, Airlangga University

ABSTRACT

Isopropyl-β-D-thiogalactopyranoside (IPTG) is the most commonly used inducer in the process of genetic engineering. IPTG will induce the expression of recombinant proteins in *E. coli*, but IPTG as an inducer is not efficient when used on an industrial scale. The purpose of this study was to find alternative inducers of lactose and galactose as a substitute for IPTG to increase xylanolytic enzyme production, especially on an industrial scale. This experiment was carried out by optimizing the inducer concentration with a variation of 10 mM, 20 mM, 30 mM, 40 mM, 50 mM, and 40 hours of cultivation time. The results of concentration optimization were obtained from the activity test using DNS (3,5-dinitrosalicylic acid) which was at a concentration of galactose 40 mM and lactose 50 mM. While the optimum cultivation time to produce xylanolytic enzymes using galactose 40 mM inducer which is 12 hours and lactose 10 hours. Then the enzyme specific activity test was performed using pNP-A and pNP-X substrates. The results of the activity test using pNP-A substrate using galactose 40 mM inducer and 50 mM lactose respectively 610,5 U/mL and 347,8 U/mL. While using the pNP-X substrate on a 40 mM galactose inducer and 50 mM lactose respectively 357,8 U/mL and 210,2 U/mL. The results of specific xylanolytic production activities at 1 mM IPTG inducers used pNP-A and pNP-X substrates of 408,9 U/mL and 327,3 U/mL respectively. So that the galactose inducer is able to replace 1 mM of IPTG, while lactose has not been able to replace 1 mM IPTG.

Keywords: xylanolytic enzymes, MTM, lactose, galactose