ABSTRACT

IMMOBILIZATION OF INULINASE ON CONCANAVALIN A ATTACHED SUPER MACROPOROUS CRYOGELS FOR PRODUCTION OF HIGH FRUCTOSE SYRUP

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In this study, Concanavalin A (Con A) attached poly(ethylene glycol dimethacrylate) [poly(EGDMA)] cryogels were used for immobilization of *Aspergillus niger* inulinase. For this purposes, the monolithic cryogel column was prepared by radical cryocopolymerization of EGDMA as a monomer and N,N'-methylene-bisacrylamide as a crosslinker. Then Con A was attached by covalent binding onto poly(EGDMA) cryogel via gluteraldehyde activation. Characterization of cryogels was performed by FTIR, SEM, EDX and swelling studies. Cryogels were opaque, sponge like and elastic. Poly (EGDMA) cryogels were highly porous and pore size is approximately 50 μm. Con A attached poly(EGDMA) cryogels was used in the adsorption of inulinase from aqueous solutions. Adsorption of inulinase on the Con A attached poly (EGDMA) cryogel was performed in continuous system and the effects of pH, inulinase concentration, temperature, ionic strength and flow rate on adsorption were investigated. The maximum amount of inulinase adsorption was calculated to be 27.85 mg/g cryogel at 1.0 mg/mL inulinase concentration and acetate buffer at pH 4.0. Immobilized inulinase was effectively used in continuous preparation of high fructose syrup. Inulin was converted to fructose at continuous system and the fructose concentration was found to be 0,23 mg/mL at the end of 5 minute of hydrolysis. High fructose content of the syrup was demonstrated by thin layer chromatography.

Key words: Inulinase, cryogel, Concanavalin A, fructose, lectin affinity chromatography.