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KEY WORD: *Aspergillus* sp. / GLUCONIC ACID / IMMOBILIZED MYCELIA / CALCIUM ALGINATE

KULTIRA SOOSUK : PRODUCTION OF GLUCONIC ACID BY *Aspergillus* sp. G153 IMMOBILIZED IN CALCIUM ALGINATE. THESIS ADVISOR : ASSO. PROF. KANNIKA CHANTARASA-ARD, 120 pp. ISBN 974-632-534-5

The suitable conditions for the immobilization of *Aspergillus* sp. G153 spores in calcium alginate beads and precultivation were as followed; 1.0 - 2.5 x $10^9$ spores per 2.5% (w/v) of 100 ml. sodium alginate, 3.5 mm. bead size and 66 hr. precultivation time in medium containing 250 g/l of glucose and 0.8 g/l of ammonium sulfate as carbon and nitrogen sources respectively. Forty grams of the immobilized bead per 1 liter of production medium containing 250 g of glucose and 0.2 g of ammonium sulfate as carbon and nitrogen sources respectively were suitable for gluconic acid production in shake flask culture. The optimal conditions for gluconic acid production in glass bubble column were 50 and 0.2 g/l of glucose and ammonium sulfate as carbon and nitrogen sources respectively, aeration rate : 10 vvm, inoculum size : 30% (w/v).

Starch hydrolysate and tap water could be used in stead of glucose and deionized water for 10 repeated batch in glass bubble column without reduction in the yield. Moreover, for six repeated batch in medium containing only starch hydrolysate and tap water, there is no decrease in production. The examination of the mycelial growth by scanning electron microscope demonstrated mycelial growth at the bead surface and extended 0.5 - 0.6 mm. into the bead. The immobilized spore and mycelia were able to retain their activities even after storing at 6 °C for 7 and 5 days respectively.

**ภาควิชา** จุลชีววิทยา **ลายมือชื่อนิสิต** กุลธิรา ชูสุข

**สาขาวิชา** จุลชีววิทยาทางอุตสาหกรรม **ลายมือชื่ออาจารย์ที่ปรึกษา** กรรณิการ์ ชัยสิทธา

**ปีการศึกษา** 2538 **ลายมือชื่ออาจารย์ที่ปรึกษาร่วม** -