Biosurfactant Production, Isolation and Purification Using Cell Immobilization in Bacillus subtilis Biosystem

賴振邦、徐泰浩

E-mail: 8701424@mail.dyu.edu.tw

ABSTRACT

Surfactants have wide applications in many industries. Thus far most ofthe surfactants used are synthetic. Due to environmental and health impactof synthetic surfactants, biosurfactants have drawn many attentions, and itsgrowing importance is expected. Generaly speaking, biosurfactants areamphiphilic compound produced through fermentation. Special features ofbiosurfactants includes: very low Critical Micelle Concentration (CMC),stable over wide range of temperature, pH, and high salt concentratio n, ascompared to synthetic surfactants. Bacillus subtilis produces lipopeptidebiosurfactants which has excellent interfacial activities, is commonlycalled surfactins. Chitosan is an abundant resource in nature that can bereborn in lifecycles of nature, and has been widely used in medicaltreatments, agriculture, industries, fishery, cosmetics. Its promisingfuture is commonly recognized. Chitosan are deduced from chitin throughdeacetylation, and have versatile functional properties, one of which is bio-compatibility and capability of forming porous gel beads that is animportant characteristic to serve as supporting matrix for cellimmobilization. This research is devoted to cell immobilization usingchitosan as solid support, and to study the behavior of the bioreactor andthe immobilized bacterium (Bacillus subtilis), also, the recovery of thesurfactins. Results showed that 3% (w/v) of chitosan treated with carboxylgives good performance. The nutrient broth of ADSA was found to be suitablefor both c ell growth and surfactins production. Optimum inoculumconcentration was 1% (w/v). Recovery rate of surfactins can be increased byseparating the foam. The use of ultrafiltration membrane of YM100 and ethylacetate increased the quantities of surfactins recovered.

Keywords : 生物界面活性劑 ; 細胞固定化 ; 枯草桿菌 ; 表面素 ; 臨界微胞濃度 ; 幾丁聚糖

Table of Contents