ABSTRACT

Surfactants have wide applications in many industries. Thus far most of the surfactants used are synthetic. Due to environmental and health impact of synthetic surfactants, biosurfactants have drawn many attentions, and its growing importance is expected. Generally speaking, biosurfactants are amphiphilic compound produced through fermentation. Special features of biosurfactants include: very low Critical Micelle Concentration (CMC), stable over wide range of temperature, pH, and high salt concentration, as compared to synthetic surfactants. Bacillus subtilis produces lipopeptide biosurfactants which has excellent interfacial activities, is commonly called surfactins. Chitosan is an abundant resource in nature that can be re-born in life-cycles of nature, and has been widely used in medical treatments, agriculture, industries, fishery, cosmetics. Its promising future is commonly recognized. Chitosan are deduced from chitin through deacetylation, and have versatile functional properties, one of which is bio-compatibility and capability of forming porous gel beads that is an important characteristic to serve as supporting matrix for cell immobilization. This research is devoted to cell immobilization using chitosan as solid support, and to study the behavior of the bioreactor and the immobilized bacterium (Bacillus subtilis), also, the recovery of the surfactins. Results showed that 3% (w/v) of chitosan treated with carboxyl gives good performance. The nutrient broth of ADSA was found to be suitable for both cell growth and surfactins production. Optimum inoculum concentration was 1% (w/v). Recovery rate of surfactins can be increased by separating the foam. The use of ultrafiltration membrane of YM100 and ethylacetate increased the quantities of surfactins recovered.

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