

Title Growth inhibitory effect on bacteria of chitosan membranes regulated with deacetylation degree

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Abstract

Antibacterial activity of chitosan membranes was investigated by a conductimetric assay using a Bactometer. The purpose of this investigation was to produce a practical, high-performance membrane for separation engineering. The antibacterial activity of powdered chitosan membrane was evaluated by the minimal inhibitory concentration (MIC). The MIC for *Escherichia coli* was almost 200 (mg-chitosan/ml-bacterial suspension), and for *Staphylococcus aureus* it was 40 (mg-chitosan/ml-bacterial suspension). Growth of the gram-positive sample (*S. aureus*) was more strongly inhibited by chitosan than the gram-negative sample (*E. coli*). This inhibitory effect was recognized as a bactericidal effect. Antibacterial activity was also observed and depended on the shape and the specific surface area of the powdered chitosan membrane. The influence of the deacetylation degree (DD) of the chitosan on inhibiting the growth of *S. aureus* was investigated by two methods: incubation using a mannitol salt agar medium, and a conductimetric assay. By both methods, chitosan with a higher DD successfully inhibited growth of *S. aureus*. Our findings regarding the dominant role of the DD of chitosan will be useful for designing long-life, hygienic, membrane-based processes.