Quaternized 키토올리고당의 합성 및 막 제조

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Synthesis of chitooligosaccharide derivative with quaternary ammonium group and research of membrane properties

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1. INTRODUCTION

Chitin is the second most plentiful natural polymer and is attracting a lot of attention in agricultural, industrial, and medical fields.[1,2] Oligomer of chitosan, chitooligosaccharide (COS), could be easily prepared by acidic or enzymatic partial hydrolysis of chitosan. It has been reported that lower oligomers of chitosan are not only water-soluble but also exhibit versatile biological activities similar to chitosan [3,4]. It is also an important starting material for synthesizing biologically-active oligosaccharide derivatives, as reported in a few papers [5,6].

This paper reports the preparation of a functionalized COS (COS-GTMAC) by reacting COS with glycidyl trimethylammonium chloride (GTMAC).

2. RESULT

NMR analysis

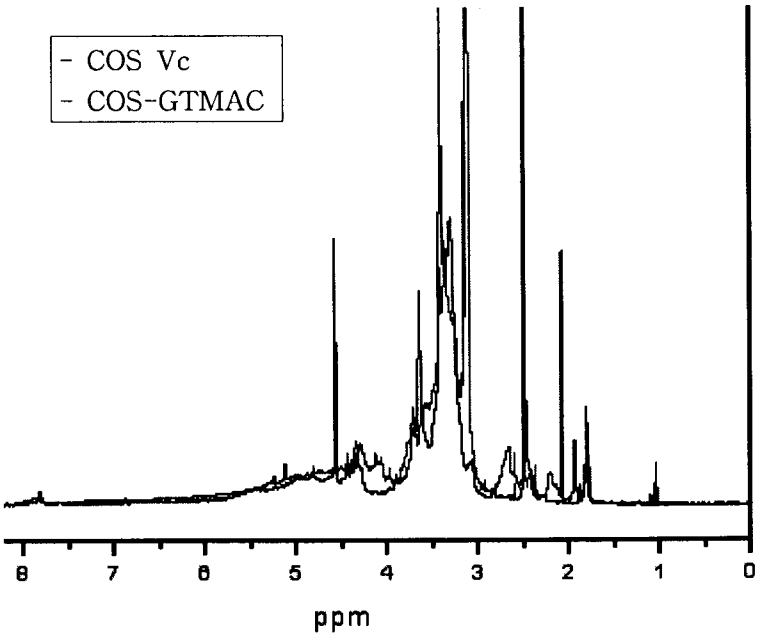

Figure 1. 1H-NMR spectrum of COS and COS-GTMAC

Fig. 1. shows NMR spectrum of COS and the COS-GTMAC obtained at 60℃ for 17h. Peaks at δ=2.0 ppm correspond to rezcton of COS and GTMAC, and δ=4.5 ppm decreased due to separate of vitamin c.

SEM image

The effect of ozone treatment on the surface structure can be examined using SEM, as shown in Figure 1. After treatment with ozone, the pore size on the surface enlarged.

(a) untreated PES (b) ozone exposure

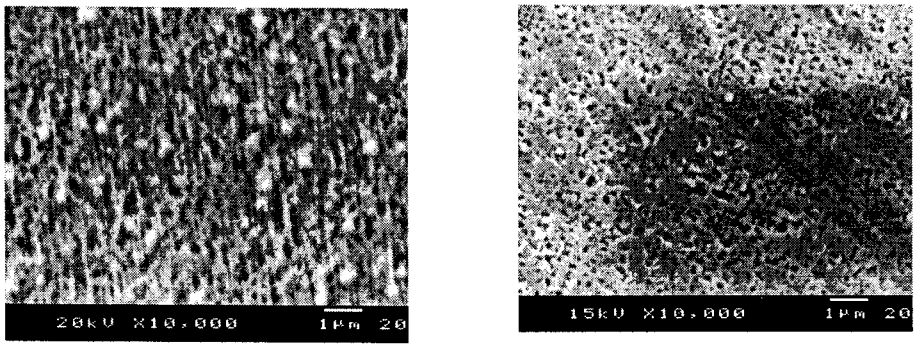

Figure 2. SEM images of PES membranes with ozone treatment

3. CONCLUSION

A derivative of COS with quaternary ammonium functionality was synthesized and compared with COS and COD-GTMAC. The COS has small molecular weight than chitosan or chitin. So, the surface of PES membrane was ozone treatment, which enables acrylic acid to be grafted, and hence COS can be coupled to the carboxyl bearing surface.

4. REFERENCES

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