ABSTRAK

SINTESIS DAN KARAKTERISASI KARBOKSIMETIL SELULOSA (CMC) DARI KULIT JAGUNG (*Zea mays*)

Kulit jagung merupakan sumber selulosa yang menjadi salah satu limbah pertanian terbesar di Indonesia. Penelitian ini bertujuan untuk memanfaatkan selulosa dalam kulit jagung untuk disintesis menjadi karboksimetil selulosa lalu membandingkannya dengan karboksimetil selulosa komersil dan regulasi sesuai SNI 06-3736-1995 CMC mutu I. Karboksimetil selulosa merupakan salah satu turunan selulosa yang banyak dimanfaatkan seperti pada bidang pangan, kosmetik, tekstil, dan lain-lain. Sintesis karboksimetil selulosa ini melalui beberapa tahap, yaitu isolasi selulosa, sintesis karboksimetil selulosa, dan karakterisasi. Karakterisasi yang dilakukan ialah uji identifikasi, gugus fungsi dan penentuan derajat substitusi oleh FTIR, uji pH larutan 1%, uji kadar NaCl, dan uji kemurnian CMC. Metode isolasi yang digunakan ialah hidrolisis alkali dan pemutihan, sedangkan metode sintesis yang digunakan ialah alkalisasi dan karboksimetilasi dengan NaOH 15% dan 12 gram natrium monokloroasetat. Penelitian sintesis karboksimetil selulosa berhasil dilakukan dan didapat hasil rendemen selulosa kulit jagung sebesar 22,02%, rendemen karboksimetil selulosa sebesar 120%, pH larutan 1% sebesar 7,29, kadar NaCl sebesar 0,34%, kemurnian sebesar 99,66%, dan derajat substitusi sebesar 1,14. Berdasarkan hasil penelitian terhadap karboksimetil selulosa menggunakan FTIR (*Fourier Transform Infra Red*) diketahui puncak khas karboksimetil selulosa yang mirip seperti karboksimetil selulosa komersil yaitu 3423,65 cm^{-1} untuk gugus -OH, 2920,23 cm^{-1} untuk gugus -CH, 1600,92 cm^{-1} untuk gugus karboksil, 1421,54 cm^{-1} untuk ikatan $-CH_2$, dan 1064,71 cm^{-1} untuk gugus eter. Dari hasil penelitian yang didapat, diketahui bahwa karboksimetil selulosa memiliki karakteristik yang mirip dengan karboksimetil selulosa komersil dan telah memenuhi syarat SNI 06-3736-1995 CMC mutu I.

Kata-kata kunci: kulit jagung; selulosa; sintesis; karboksimetil selulosa; derajat substitusi.

ABSTRACT

SYNTHESIS AND CHARACTERIZATION OF CARBOXYMETHYL CELLULOSE (CMC) FROM CORN HUSK (Zea mays)

Corn husk is a source of cellulose which is one of the largest agricultural wastes in Indonesia. This study aims to utilize cellulose in corn husks to be synthesized into carboxymethyl cellulose and then compare it with commercial carboxymethyl cellulose and regulations according to SNI 06-3736-1995 CMC quality I. Carboxymethyl cellulose is a cellulose derivative that is widely used in the fields of food, cosmetics, textiles, and others. The synthesis of carboxymethyl cellulose went through several stages, that is isolation of cellulose, synthesis of carboxymethyl cellulose, and characterization. The characterizations carried out were identification test, functional group and determination of substitution degree by FTIR, 1% solution pH test, NaCl level test, and CMC purity test. The isolation method used was alkaline hydrolysis and bleaching, while the synthesis method used was alkalization and carboxymethylation with 15% NaOH and 12 grams of sodium monochloroacetate. Research on the synthesis of carboxymethyl cellulose was successfully carried out and the yield of corn husk cellulose was 22.02%, carboxymethyl cellulose yield was 120%, pH of 1% solution was 7.29, NaCl content was 0.34%, CMc purity was 99.66%, and degree of substitution was 1.14. Based on the results of research on carboxymethyl cellulose using FTIR (Fourier Transform Infra Red), it is known that the typical peak of carboxymethyl cellulose is the same as commercial carboxymethyl cellulose, that is 3423,65 cm^{-1} for -OH group, 2920,23 cm^{-1} for -CH group, 1600,92 cm^{-1} for carboxyl group, 1421,54 cm^{-1} for $-CH_2$ bond, and 1064,71 cm^{-1} for ether group. From the results obtained, it is known that carboxymethyl cellulose has characteristics similar to commercial carboxymethyl cellulose and has met the requirements of SNI 06-3736-1995 CMC quality I.

Keywords: corn husk; cellulose; synthesis; carboxymethyl cellulose; degree of substitution.