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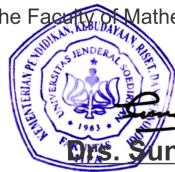
Invited Speaker

with a paper entitled:

"The Crystallite Size, Ionic Conductivity and Dielectric Constant of Chitosan-Milled"

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Drs. Sunardi, M.Si

Conference Chair

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THE CRYSTALLITE SIZE, ELECTRIC PERMITTIVITY, AND DIELECTRIC CONSTANT OF CHITOSAN-MILLED

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ABSTRAK

Fabrikasi serbuk kitosan dengan variasi waktu milling dilakukan untuk menentukan ukuran kristali, permitivitas listrik, dan impedansi. Variasi waktu milling yang digunakan adalah 0, 60, 120 dan 240 menit ditandai dengan CH0, CH60, CH120 dan CH240. Karakterisasi serbuk kitosan hasil milling untuk menentukan permitivitas listrik dan konstanta dielektrik menggunakan Electrochemical Impedance Spectroscopy (EIS). Sedangkan, X-Ray Diffraction (XRD) digunakan untuk menentukan ukuran kristalin dan lattice strain serbuk kitosan hasil milling. Hasil karakterisasi XRD menunjukkan bahwa the crystallite size optimum of CH120 was 20.1 nm. The electric permittivity and dielectric constant values decreased with the frequency and increased with the milling time.

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Kata kunci: fase, ukuran kristalin, kitosan, PEG4000, LiCF_3SO_3 .

ABSTRACT

Synthesis and characterization of chitosan/PEG4000/ LiCF_3SO_3 solid electrolyte polymer membrane were carried out to determine the crystalline size and type of structure using X-Ray Diffraction (XRD). The fabrication of chitosan/PEG4000/ LiCF_3SO_3 electrolyte polymer membrane was carried out by the solution casting method. The samples used in the XRD test were chitosan, chitosan/PEG4000, and chitosan/PEG4000/ LiCF_3SO_3 electrolyte polymer membranes. XRD test showed that the crystalline size of the chitosan, chitosan/PEG4000, and chitosan/PEG4000/ LiCF_3SO_3 electrolyte polymer membranes experienced a 2 angle shift and formed a semicrystalline phase. The peak intensity increase occurred after chitosan was added with PEG4000 and LiCF_3SO_3 plasticizer. The crystalline size obtained for chitosan, chitosan/PEG4000, and chitosan/PEG4000/ LiCF_3SO_3 electrolyte polymer membranes are 4,002 nm; 2,474 nm, and 4,183 nm, respectively. Meanwhile, the type of structure produced by the chitosan, chitosan/PEG4000, and chitosan/PEG4000/ LiCF_3SO_3 electrolyte polymer membranes is a semicrystalline phase. The XRD test results show that the chitosan/PEG4000/ LiCF_3SO_3 polymer membrane can be used as an alternative solid electrolyte polymer secondary battery.

Keywords: chitosan, PEG4000, LiCF_3SO_3 , membrane, crystalline size

INTRODUCTION

Chitosan is one of the organic biopolymer materials processed with deacetylation of chitin that is polymerization of glucosamine chains (2-amino-2-deoksi- β -(1-4)-D-Glukosa) and has a molecule formula $[\text{C}_6\text{H}_{11}\text{NO}_4]_n$ with a molecular weight is $2,5 \times 10^5$ Dalton. Characteristic of chitosan is non-toxic, biodegradable, and hydrophilic.