

NURUL HUDA NPM 22.03.4.1.1.00027. Pengaruh Garam Natrium Hipoklorit Pada Proses *Bleaching* Terhadap Kemurnian Selulosa Sebagai Bahan Biofilm. Pembimbing **Wiwit Sri Werdi Pratiwi, S.Si., M.Sc., M.Si.**

ABSTRAK

Pemanfaatan biomassa limbah marine-agroindustri sebagai sumber selulosa menjadi pendekatan strategis dalam pengembangan material biodegradable ramah lingkungan. Penelitian ini bertujuan menganalisis pengaruh penambahan natrium hipoklorit (NaOCl) pada proses *bleaching* terhadap kemurnian selulosa dari limbah kulit edamame (*Glycine max* L.) sebagai bahan baku biofilm. Penelitian dilakukan melalui tahap alkalisasi menggunakan NaOH 5% dan *bleaching* menggunakan NaOCl dengan variasi konsentrasi 3%, 5%, dan 7%. Parameter yang dianalisis meliputi rendemen, indeks keputihan (*Whiteness Index*), serta komposisi kimia berupa kadar selulosa, hemiselulosa, holoselulosa, dan lignin. Hasil penelitian menunjukkan bahwa variasi konsentrasi NaOCl berpengaruh signifikan ($p < 0,05$) terhadap seluruh parameter pengamatan. Perlakuan NaOCl 3% menghasilkan rendemen tertinggi sebesar 72,42% dengan indeks keputihan 69,10%. Sementara itu, perlakuan NaOCl 7% menghasilkan kemurnian selulosa tertinggi sebesar 90,24%, dengan kadar lignin 2,93% dan hemiselulosa 1,56%. Namun, peningkatan konsentrasi NaOCl menyebabkan penurunan rendemen akibat degradasi parsial selulosa. Secara keseluruhan, NaOCl efektif sebagai agen *bleaching* dalam meningkatkan kemurnian selulosa melalui proses delignifikasi dan penghilangan hemiselulosa. Limbah kulit edamame berpotensi sebagai sumber selulosa untuk pengembangan biofilm biodegradable ramah lingkungan.

Kata Kunci: Natrium hipoklorit, *Bleaching*, Selulosa, Edamame, Biofilm.

NURUL HUDA NPM 22.03.4.1.1.00027. *The Effect of Sodium Hypochlorite Salt in the Bleaching Process on Cellulose Purity as a Biofilm Material.*
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ABSTRACT

*The utilization of marine-agroindustrial waste as a cellulose source has become a strategic approach in developing environmentally friendly biodegradable materials. This study aimed to analyze the effect of sodium hypochlorite (NaOCl) addition in the bleaching process on the purity of cellulose derived from edamame (*Glycine max* L.) husk waste as a raw material for biofilm. The research was conducted through alkalization using 5% NaOH followed by bleaching with NaOCl at concentrations of 3%, 5%, and 7%. Parameters analyzed included yield, Whiteness Index (WI), and chemical composition consisting of cellulose, hemicellulose, holocellulose, and lignin content. The results showed that NaOCl concentration significantly affected ($p < 0.05$) all observed parameters. The 3% NaOCl treatment produced the highest yield of 72.42% with a whiteness index of 69.10%. Meanwhile, the 7% NaOCl treatment resulted in the highest cellulose purity of 90.24%, with lignin and hemicellulose contents reduced to 2.93% and 1.56%, respectively. However, increasing NaOCl concentration decreased yield due to partial cellulose degradation. Overall, NaOCl was effective as a bleaching agent in improving cellulose purity through delignification and hemicellulose removal. Edamame husk waste shows strong potential as a cellulose source for environmentally friendly biodegradable biofilm development.*

Keywords: Sodium hypochlorite, Bleaching, Cellulose, Edamame, Biofilm.