

Yudiwinata, R. P. 2020. **Pemanfaatan Cangkang Kerang Batik (*Paphia undulata*) Sebagai Adsorben untuk Menurunkan Kadar Timbal Pb(II) Sintetis**. Skripsi ini dibawah bimbingan Dr. Eko Prasetyo Kuncoro, S.T., DEA. dan Dr. Handoko Darmokoesoemo, Drs, DEA. Program Studi S1 Teknik Lingkungan, Departemen Biologi, Fakultas Sains dan Teknologi, Univeritas Airlangga.

ABSTRAK

Penelitian ini bertujuan untuk mengetahui karakteristik adsorben cangkang kerang batik (*Paphia undulata*) berdasarkan analisis pH *point of zero charge* (pH_{pzc}), mengetahui adanya perbedaan efisiensi adsorpsi Pb(II) menggunakan adsorben cangkang kerang batik (*Paphia undulata*) berdasarkan variasi pH dan karakteristik adsorben cangkang kerang batik (*Paphia undulata*) menggunakan FTIR, XRD dan TGA. Percobaan dilakukan dalam skala laboratorium dan teknik adsorpsi yang digunakan adalah teknik *batch*. Variasi pH pada penelitian ini adalah pH 2, 3, 4, 5, 6, 7 dan pH asli (6,1). Analisis statistik dengan *Anova-One Way*, lalu dilanjutkan dengan uji Duncan. pH optimum didapatkan pada pH 5 dengan efisiensi adsorpsi 80,69%. Hasil penelitian menunjukkan ada perbedaan efisiensi adsorpsi Pb(II) pada variasi pH. pH_{pzc} yang didapatkan yakni 11,8. Hasil pengujian FTIR menunjukkan bahwa cangkang kerang batik (*Paphia undulata*) mengandung gugus fungsi C-O *Stretching Vibration*, CO_3^{2-} *Symetric Vibration*, CO_3^{2-} *Out-Of-Plane-Bending* dan C-H. Hasil pengujian XRD menunjukkan bahwa cangkang kerang batik (*Paphia undulata*) mengandung $CaCO_3$ pada sudut pergerakan 2θ 33,6°. Hasil pengujian TGA menunjukkan bahwa cangkang kerang batik (*Paphia undulata*) menunjukkan penurunan massa sebesar 43,7%.

Kata kunci: adsorpsi, *Paphia undulata*, pH, pH_{pzc} , FTIR, XRD, TGA

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ABSTRACT

The purpose of this work were to determine the characteristics of the *Paphia undulata* as adsorbent based on pH point of zero charge (pH_{pzc}) analysis, to determine the differences in the efficiency of Pb(II) adsorption using the *Paphia undulata* based on variation pH and to determine characteristics of *Paphia undulata* adsorbent using FTIR, XRD and TGA before adsorption. The experiment was carried out on a laboratory scale and the adsorption technique used was the batch technique. Variations in pH in this study were pH 2, 3, 4, 5, 6, 7 and original pH (6,1). After that, using statistical analysis ANOVA-One Way, continued with Duncan test. The optimum result of pH_{pzc} obtained was 11.8. The optimum pH was obtained at the pH 5 with an adsorption efficiency of 80,69%. The results showed that there was differences adsorption efficiency of Pb(II) on variations in pH. The FTIR test results show that the adsorbent contain C-O Streching Vibration, CO_3^{2-} Symetric Vibration, CO_3^{2-} Out-Of-Plane-Bending dan C-H. The XRD test result show that the adsorbent contain $CaCO_3$ at a moving angle of 2θ 33.6°. The TGA test result sho the the adsorbent showed a decrease in mass of 43.7%.

Keywords: adsorption, *Paphia undulata*, pH, pH_{pzc} , FTIR, XRD, TGA