

Syafidah, I.P.D., 2020. Pemanfaatan *Bittern* Sebagai Koagulan Alternatif Untuk Menurunkan Konsentrasi *Chemical Oxygen Demand* dan Kekeruhan Pada Limbah Cair Industri Tempe. Skripsi ini dibawah bimbingan Drs. Agus Supriyanto, M.Kes. dan Dr. Nurina Fitriani, S.T. Program Studi S1 Teknik Lingkungan, Departmen Biologi, Fakultas Sains dan Teknologi, Universitas Airlangga.

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### ABSTRAK

Penelitian ini bertujuan untuk mengetahui pengaruh dan interaksi variasi dosis koagulan dan kecepatan pengadukan cepat dengan menggunakan koagulan *bittern* untuk menurunkan konsentrasi COD dan kekeruhan. Variasi dosis koagulan yang digunakan dalam penelitian ini, yaitu: 10%, 20%, 30%, dan 40%. Variasi kecepatan pengadukan cepat yang digunakan dalam penelitian ini, yaitu: 55, 90 dan 125 RPM. pengukuran konsentrasi COD menggunakan metode refluks terbuka secara titrimetri, sedangkan konsentrasi kekeruhan menggunakan turbidimeter. Pengambilan sampel limbah cair tempe dilakukan di Kampung Tempe, Tenggilis Kauman. Pengambilan *bittern* dilakukan di Pademawu, Pamekasan. Karakteristik awal limbah cair tempe menunjukkan konsentrasi COD dan kekeruhan sebesar 20.343 mg/L dan 1.084 NTU yang belum memenuhi baku mutu limbah cair pada Peraturan Gubernur Jawa Timur 72 Tahun 2013 sehingga perlu dilakukan pengolahan air limbah dengan alternatif pengolahan koagulasi-flokulasi. Penelitian ini dilakukan menggunakan uji *jar test*, dengan variasi dosis koagulan *bittern* masing-masing 10%, 20%, 30%, dan 40% serta pengadukan cepat masing-masing 55, 90, dan 125 RPM selama 5 menit dan pengadukan lambat 30 RPM selama 15 menit. Hasil penelitian dianalisis statistik dengan uji *Anova-Two Way* yang menunjukkan adanya signifikansi persentase penurunan konsentrasi COD dan kekeruhan tertinggi pada variasi dosis koagulan 40% dan variasi kecepatan pengadukan cepat 125 RPM dengan persentase penurunan konsentrasi COD sebesar 52,72% dan kekeruhan sebesar 78,69%. Konsentrasi COD akhir sebesar 9.871 mg/L dan kekeruhan 231 NTU belum sesuai dengan baku mutu yang ditetapkan.

**Kata kunci:** *bittern*, COD, kekeruhan, koagulasi, limbah cair industri tempe.

Syafidah, I.P.D., 2020. Utilization of *Bittern* as an Alternative Coagulant to Reduce Chemical Oxygen Demand Concentration and Turbidity in Tempe Industry Liquid Waste. This thesis is under the guidance of Drs. Agus Supriyanto, M.Kes. and Dr. Nurina Fitriani, S.T. S1 Environmental Engineering Study Program, Department of Biology, Faculty of Science and Technology, Airlangga University.

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### ABSTRACT

This study aims to determine the effect and interaction of coagulant dose variations and rapid stirring speed by using bittern coagulants to reduce COD concentration and turbidity. Coagulant dose variations used in this study were 10%, 20%, 30%, and 40%. The variation of the fast stirring speed used in this study, namely: 55, 90 and 125 RPM. COD concentration measurements using titrimetric open reflux method, while turbidity concentration uses turbidimeter. Sampling of tempe liquid waste was carried out in Tempe Village, Tenggilis Kauman. The bittern was taken in Pademawu, Pamekasan. Early characteristics of tempe liquid waste showed COD concentration and turbidity of 20,343 mg / L and 1.084 NTU which has not met the liquid waste quality standard so that it is necessary to treat wastewater with alternative coagulation-flocculation treatment. This research was conducted using a jar test, with variations in the dose of bittern coagulant, respectively 10%, 20%, 30%, and 40% and rapid stirring of 55, 90, and 125 RPM for 5 minutes and slow stirring of 30 RPM respectively 15 minutes. The results of the study were statistically analyzed with the Anova-Two Way test which showed the significance of the percentage decrease in COD concentration and the highest turbidity in the variation of the coagulant dose of 40% and the variation of the fast stirring speed of 125 RPM with the percentage reduction in COD concentration of This research was conducted using a jar test, with variations in the dose of bittern coagulant, respectively 10%, 20%, 30%, and 40% and rapid stirring of 55, 90, and 125 RPM for 5 minutes and slow stirring of 30 RPM respectively 15 minutes. The results of the study were statistically analyzed with the Anova-Two Way test which showed the significance of the percentage decrease in COD concentration and the highest turbidity in the variation of the coagulant dose of 40% and the variation of the fast stirring speed of 125 RPM with the percentage reduction in COD concentration of This research was conducted using a jar test, with variations in the dose of bittern coagulant, respectively 10%, 20%, 30%, and 40% and rapid stirring of 55, 90, and 125 RPM for 5 minutes and slow stirring of 30 RPM respectively 15 minutes. The results of the study were statistically analyzed with the Anova-Two Way test which showed the significance of the percentage decrease in COD concentration and the highest turbidity in the variation of the coagulant dose of 40% and the variation of the fast stirring speed of 125 RPM with the percentage reduction in COD concentration of 52.72% and turbidity of 78.69%. Final COD concentration of 9,871 mg / L and turbidity of 231 NTU were not in accordance with established quality standards.

**Keywords:** bittern, COD, turbidity, coagulation, tempe industrial liquid waste