

APPLICATION OF POTTER, ZEOLITE, AND ACTIVATED CHARCOAL FILTRATION MEDIA FOR Chromium (Cr) CONTAMINATION IN THE BATIK INDUSTRY LIQUID WASTE

Muh Nurdiansyah Sahlan¹, Narto², Achmad Husein³

*Poltekkes Kemenkes Yogyakarta, Jalan Tatabumi No.3 Banyuraden, Gamping, Sleman,
noer1897@gmail.com

Abstract

Batik industry liquid waste contains several heavy metals including chromium (Cr), iron (Fe), and aluminium (Al). Chromium (Cr) is carcinogenic because it can damage chromatin structure and cell function. In Bantul Regency, there is one batik industry whose industrial waste is not managed properly. Liquid waste taken in the wet process in the form of activities that use water such as staining, spraying, and washing contains chromium levels of 1,560 mg / L which exceeds the quality standards of the Indonesian Minister of Environment Regulation Number 5 of 2014. The purpose of this study is to process batik industry liquid waste using pottery waste fragment media, zeolite, and activated charcoal. This type of research uses the Quasi experiment method, with the design "Pre – Post test design Group. The object of this study is the chromium (Cr) level of the batik industry. The samples in this study were to take samples of batik industry liquid waste treated with filtration media for pottery waste fragments, zeolite, and activated charcoal. The data were analyzed deskriptively and inferential to determine the difference before and after the filtering treatment with filter media for pottery waste fragments, zeolite, and activated charcoal with three thickness variations: P1 (40 cm: 15 cm: 15 cm), P2 (15 cm: 15 cm: 40 cm), P3 (15 cm: 40 cm: 15 cm). The results obtained in this study are known to have a significance value of 0.00, so it can be concluded that there is an influence of the three variations in filter thickness with fractional media of pottery waste, zeolite, and activated charcoal on decreasing chromium (Cr) levels.

Keywords: Batik Liquid Waste, Chromium, Pottery Fragments, Zeolite, Activated Charcoal.

APLIKASI MEDIA FILTRASI PECAHAN LIMBAH GERABAH, ZEOLIT, DAN ARANG AKTIF UNTUK MENGOLAH CEMARAN KROMIUM (Cr) PADA LIMBAH CAIR INDUSTRI BATIK

Muh Nurdiansyah Sahlan¹, Narto², Achmad Husein³

*Poltekkes Kemenkes Yogyakarta, Jalan Tatabumi No.3 Banyuraden, Gamping,
Sleman,
noer1897@gmail.com

Intisari

Limbah cair industri batik mengandung beberapa logam berat antara lain kromium (Cr), besi (Fe), dan aluminium (Al). Kromium (Cr) bersifat karsinogenik karena dapat merusak struktur kromatin dan fungsi sel. Di Kabupaten Bantul terdapat salah satu industri batik yang limbah industrinya tidak dikelola dengan baik. Limbah cair yang diambil pada proses basah berupa aktivitas yang menggunakan air seperti pewarnaan, pelodoran, dan pencucian mengandung kadar kromium sebesar 1,560 mg/L dimana angka tersebut melebihi baku mutu Peraturan Menteri Lingkungan Hidup Republik Indonesia Nomor 5 tahun 2014. Tujuan penelitian ini adalah untuk melakukan pengolahan limbah cair industri batik dengan menggunakan media pecahan limbah gerabah, zeolit, dan arang aktif. Jenis penelitian ini menggunakan metode *Quasi experiment*, dengan desain "*Pre – Post test desain Group*". Obyek penelitian ini adalah kadar kromium (Cr) dari industri batik. Sampel dalam penelitian ini yaitu mengambil sampel limbah cair industri batik yang diolah dengan media filtrasi pecahan limbah gerabah, zeolit, dan arang aktif. Data dianalisis deskriptif dan inferensial untuk mengetahui perbedaan sebelum dan sesudah pengolahan penyaringan dengan media filter pecahan limbah gerabah, zeolit, dan arang aktif dengan tiga variasi ketebalan: P1 (PG 40 cm : Z 15 cm : AA 15 cm), P2 (PG 15 cm : Z 40 cm : AA 15 cm), P3 (PG 15 cm : Z 15 cm : AA 40 cm). Hasil yang diperoleh dalam penelitian ini diketahui nilai signifikansi *p-value*

sebesar 0.00 maka dapat disimpulkan ada pengaruh ketiga variasi ketebalan filter dengan media pecahan limbah gerabah, zeolit, dan arang aktif terhadap penurunan kadar kromium (Cr).

Kata kunci : Limbah Cair Batik, Kromium, Pecahan Gerabah, Zeolit, Arang Aktif.