

Politeknik Kesehatan Bandung

Program DIV Sanitasi Lingkungan

SKRIPSI, Juli 2021

Abstrak

Reta Athaya Mutiara Farid

**PENGARUH VARIASI KETEBALAN MEDIA ADSORBEN ZEOLIT DAN
KARBON AKTIF TERHADAP PENURUNAN KADAR FENOL PADA
LIMBAH CAIR *NON-DESTRUCTIVE TESTING* (NDT) PT. PUDAK
SCIENTIFIC**

viii + 69 halaman + 13 tabel + 10 lampiran

Limbah cair produksi mengandung kadar fenol yang berasal dari unit *Non-Destructive Testing* (NDT) karena menggunakan bahan pelarut. Berdasarkan hasil pemeriksaan laboratorium yang dilakukan pada limbah cair NDT PT. Puduk Scientific didapatkan bahwa kadar fenol sebesar 2,33 mg/L dengan baku mutu sebesar 0,5 mg/L berdasarkan Peraturan Menteri Lingkungan Hidup Nomor 5 Tahun 2014 Tentang Baku Mutu Air Limbah. Tujuan penelitian ini untuk mengetahui pengaruh variasi ketebalan media adsorben zeolit dan karbon aktif dalam menurunkan kadar fenol pada limbah cair. Penelitian ini bersifat eksperimen dengan desain penelitian *pretest-posttest without control*. Sampel dalam penelitian ini adalah limbah cair NDT PT. Puduk Scientific. Teknik pengambilan sampel secara *grab sampling*. Pengujian dilakukan sebanyak 6 kali pengulangan dengan menggunakan sistem aliran *batch*. Pengujian statistika dengan menggunakan *One Way Anova* menunjukkan perbedaan yang bermakna antar variasi ketebalan media adsorben zeolit dan karbon aktif dalam menurunkan kadar fenol karena memiliki *p value* < α ($0,035 < 0,05$). Rata-rata kadar fenol setelah melewati media adsorben pada ketebalan 40 cm yaitu 0,99 mg/L dengan persentase penurunan sebesar 63%, pada ketebalan 60 cm yaitu 0,60 mg/L dengan persentase penurunan sebesar 77% dan pada ketebalan 80 cm yaitu 0,28 mg/L dengan persentase penurunan sebesar 89%. Adapun ketebalan yang paling efektif dalam menurunkan kadar fenol pada limbah cair NDT yaitu pada ketebalan 80 cm. Adapun untuk peneliti selanjutnya untuk dilakukan penelitian lebih lanjut mengenai kondisi jenuh dari media zeolit dan karbon aktif, serta menggunakan sistem aliran *continue*.

DAFTAR PUSTAKA : 38 (2004-2021)

KATA KUNCI : Limbah cair NDT, Adsorpsi, Zeolit, Karbon Aktif, Fenol

Bandung Health Polytechnic

DIV Environmental Sanitation Program

Thesis, July 2021

Abstract

Reta Athaya Mutiara Farid

**THE EFFECTS OF VARIATION OF ZEOLITE AND ACTIVE CARBON
ADSORBENT MEDIA THICKNESS TOWARDS DECREASING OF
PHENOL LEVELS IN NON-DESTRUCTIVE TESTING (NDT) WASTE OF
PT. PUDAK SCIENTIFIC**

viii + 69 pages + 13 tables + 10 appendices

The production liquid waste contains phenol content from the unit Non-Destructive Testing (NDT) because it uses solvents. Based on the results of laboratory tests conducted on the liquid waste NDT PT. Puduk Scientific found that the phenol content was 2.33 mg/L with a quality standard of 0.5 mg/L based on the Minister of Environment Regulation Number 5 of 2014 concerning Wastewater Quality Standards. The purpose of this study was to determine the effect of variations in the thickness of the adsorbent media of zeolite and activated carbon in reducing phenol levels in wastewater. This research is experimental with are search design pretest-posttest without control. The sample in this study was liquid waste NDT PT. Puduk Scientific. The sampling technique is grab sampling. The test was repeated 6 times using aflow system batch. Statistical testing using one way ANOVA showed a significant difference between variations in the thickness of the zeolite adsorbent media and activated carbon in reducing phenol levels because it had a p value $< \alpha$ ($0.035 < 0.05$). The average phenol content after passing through the adsorbent medium at a thickness of 40 cm is 0.99 mg/L with a percentage decrease of 63%, at a thickness of 60 cm is 0.60 mg/L with a percentage decrease of 77% and at a thickness of 80 cm, namely 0.28 mg/L with a percentage decrease of 89%. The thickness that is most effective in reducing phenol levels in NDT wastewater is 80 cm thick. As for the next researcher to conduct further research on the saturated condition of the zeolite and activated carbon media, and use a continuous flow system.

REFERENCES : 38 (2004-2021)

KEY WORDS : NDT liquid waste, Adsorption, Zeolite, Activated
Carbon, Phenol