

TRAY AERASI DAN ADSORBSI BATU ZEOLIT UNTUK MENURUNKAN KADAR Fe AIR SUMUR

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ABSTRAK

Kadar Fe keberadaannya penting bagi kehidupan manusia. Tetapi kadar Fe yang belum memenuhi persyaratan dapat berdampak bagi manusia bahkan lingkungan. Dari observasi dan hasil pemeriksaan studi pendahuluan didapatkan hasil kadar Fe 3,4 mg/l yang melebihi standar baku mutu Permenkes No.32 Tahun 2017 yaitu 1 mg/l. Kadar Fe yang tinggi dapat diturunkan menggunakan 3 metode yaitu aerasi, filtrasi, dan sedimentasi. Sehingga, pada penelitian ini menggunakan metode aerasi dengan model Tray Aerasi dan Adsorpsi Batu Zeolit yang bertujuan untuk menurunkan kadar Fe air sumur.

Penelitian ini menggunakan jenis penelitian deskriptif dengan variabel penelitian yaitu kadar Fe sebelum perlakuan dan setelah perlakuan Tray Aerasi dan Adsorpsi Batu Zeolit. Sedangkan populasi penelitian ini yaitu air sumur di Desa Sawo Kecamatan Karangjati Kabupaten Ngawi dan sampel penelitian ini terdiri dari 5 sumur. Sehingga, besar sampel penelitian adalah 10 sampel yang terdiri dari 5 replikasi dan 2 kelompok yaitu sebelum dan setelah perlakuan dengan teknik pengambilan sampel *grab sampel*.

Pengumpulan data penelitian terdiri dari data primer dan sekunder dengan analisis data secara deskriptif yaitu menggambarkan pengumpulan data sebagaimana mestinya dalam bentuk tabel dan grafik serta diuraikan dalam bentuk narasi dan ditarik kesimpulan. Sedangkan hasil penelitian didapatkan dari hasil pemeriksaan laboratorium yang menunjukkan kadar Fe sebelum dan setelah perlakuan tray aerasi dan adsorpsi batu zeolit mengalami penurunan dengan rata – rata 94,55%. Tetapi terdapat perbedaan hasil penelitian, peneliti menduga adanya endapan yang terlarut. Selain itu, meskipun batu zeolit dapat sebagai penyaring, namun pada penelitian ini lebih cenderung sebagai proses adsorpsi.

Dari hasil penelitian dapat disimpulkan bahwa kadar Fe sebelum perlakuan belum memenuhi persyaratan dan setelah dilakukan perlakuan terjadi proses reaksi dengan hasil memenuhi standar baku mutu. Sedangkan saran penelitian ini yaitu diperukannya proses filtrasi seperti penggunaan media pasir silika karena hasil penelitian yang tidak homogen, pengaruh tingginya kadar Fe jika suhu tersebut sama sama tinggi melebihi suhu normal air, variasi waktu penggunaan batu zeolit, dan mempertimbangkan time detention pada saat proses adsorpsi.

Kata Kunci : kadar Fe, Tray Aerasi, Adsorpsi, Batu zeolite

TRAY AERATION AND ADSORPTION OF ZEOLITE STONE TO REDUCE WATER WELL Fe LEVELS

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ABSTRACT

Fe levels are important for human life. However, Fe levels that do not meet the requirements can have an impact on humans and even the environment. From the observation and results of the preliminary study examination, it was found that the Fe content was 3.4 mg/l which exceeded the quality standard of Permenkes No.32 of 2017, namely 1 mg/l. High Fe levels can be reduced using 3 methods, namely aeration, filtration, and sedimentation. So, in this study using the aeration method with the Aeration Tray model and Zeolite Stone Adsorption which aims to reduce the Fe content of well water.

This study used a descriptive research type with research variables namely Fe levels before treatment and after treatment with Aeration Tray and Zeolite Stone Adsorption. While the population of this study is well water in Sawo Village, Karangjati District, Ngawi Regency and the sample of this study consisted of 5 wells. Thus, the study sample size was 10 samples consisting of 5 replications and 2 groups, namely before and after treatment with sampling techniques *grab sample*.

Research data collection consisted of primary and secondary data with descriptive data analysis, namely describing data collection as it should be in the form of tables and graphs and described in narrative form and conclusions drawn. While the results of the study were obtained from the results of laboratory tests which showed that Fe levels before and after the aeration tray treatment and zeolite stone adsorption decreased by an average of 94.55%. But there are differences in the results of the research, the researchers suspect that there is dissolved precipitate. In addition, although the zeolite stone can be used as a filter, in this study it is more likely as an adsorption process.

From the results of the study it can be concluded that the Fe content before treatment did not meet the requirements and after the treatment was carried out a reaction process occurred with the results meeting quality standards. While the suggestions for this research are the need for a filtration process such as the use of silica sand media because the results of the research are not homogeneous, the effect of high levels of Fe if the temperature is the same as higher than the normal temperature of water, variations in the time of using zeolite stones, and considering time detention during the adsorption process.

Keywords: Fe content, Aeration Tray, Adsorption, Zeolite