

EFFECTIVENESS OF USING VARIOUS TYPES OF CHARCOAL AS AN ADSORBENT TO REDUCE WATER HARDNESS OF PDAM KULON PROGO

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ABSTRACT

Background: Water is an important part of the lives of humans and other living creatures on this earth. Almost all human activities depend on the availability of air. PDAM Tirta Binangun Kulon Progo water has a hardness level that can be categorized as hard according to the 1971 International Standard of Drinking Water from WHO. Based on preliminary research carried out in one of the residents' houses, the hardness level was 270 mg/L. Hardness can be reduced by a filtration process using charcoal as an adsorbent. There are various types of charcoal, namely wood charcoal, coconut shell charcoal and rice husk charcoal.

Objective: To determine the effectiveness of using wood activated charcoal, rice husk activated charcoal and coconut shell activated charcoal to reduce hardness in PDAM Kulon Progo water.

Method: This type of research uses a Quasi Experiment with a Pre Test - Post Test With Control Group design.

Research results: Descriptively, the results of the water health examination of PDAM Tirta Binangun Kulon Progo with a pre test were 235.52 mg/L and the percentage reduction in treatment using activated wood charcoal was 13%, coconut shell activated charcoal was 29%, and rice husk activated charcoal was by 24%.

Conclusion: The most effective type of activated charcoal for reducing hardness in terms of its ability as an adsorbent is coconut shell activated charcoal with a reduction percentage of 29%.

Key words: Hardness, activated charcoal, activated wood charcoal, coconut shell activated charcoal, rice husk activated charcoal.

EFEKTIVITAS PENGGUNAAN BERBAGAI JENIS ARANG SEBAGAI MEDIA ADSORBEN TERHADAP PENURUNAN KESADAHAN AIR PDAM KULON PROGO

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ABSTRAK

Latar belakang: Air merupakan bagian penting bagi kehidupan umat manusia dan makhluk hidup lainnya yang ada di bumi ini. Hampir semua kegiatan manusia bergantung pada ketersediaan air. Air PDAM Tirta Binangun Kulon Progo memiliki kadar kesadahan yang bisa dikategorikan keras menurut Menurut *Internasional Standard of Drinking Water* tahun 1971 dari WHO. berdasarkan study pendahuluan yang dilakukan pada salah satu rumah warga didapatkan kadar kesadahan sebesar 270 mg/L. kesadahan dapat diturunkan dengan proses filtrasi menggunakan arang sebagai adsorben. Terdapat berbagai jenis arang yaitu seperti arang kayu, arang tempurung kelapa dan arang sekam padi.

Tujuan: Mengetahui efektivitas penggunaan arang aktif kayu, arang aktif sekam padi dan arang aktif tempurung kelapa terhadap penurunan kesadahan pada air PDAM Kulon Progo.

Metode: Jenis penelitian ini menggunakan Quasi Experiment dengan Desain ini Pre Test – Post Test With Control Group.

Hasil penelitian: Secara deskriptif, hasil pemeriksaan kesadahan air PDAM Tirta Binangun Kulon Progo dengan pre test sebesar 235,52 mg/L dan presentase penurunan perlakuan menggunakan arang aktif kayu sebesar 13%, arang aktif tempurung kelapa sebesar 29%, dan arang aktif sekam padi sebesar 24%.

Kesimpulan: Jenis arang aktif yang paling efektif untuk menurunkan kesadahan dalam kemampuannya sebagai adsorben adalah arang aktif tempurung kelapa dengan presentase penurunan sebesar 29%.

Kata kunci: Kesadahan, Arang aktif, Arang aktif kayu, Arang aktif tempurung kelapa, Arang aktif sekam padi.