THE EFFECT OF PALM SHELL ACTIVATED CARBON MEDIA SIZE VARIATIONS ON THE REDUCTION OF IRON CONTENT AND TURBIDITY IN WELL WATER

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ABSTRACT

Background: Water is a fundamental necessity for human life and is required to comply with both quality and quantity standards. Excessive iron (Fe) content and turbidity can negatively impact life. An alternative effort to reduce Fe and turbidity levels exceeding quality standards is filtration using palm shell activated carbon.

Objective: To determine the effect of varying sizes of palm shell activated carbon media on the reduction of iron (Fe) content and turbidity in well water.

Research Method: This study employed a quasi-experimental design with a *Pre-Test – Post-Test Without Control Group*. The research object was well, located in Ngumbul, Tamanan, Bantul. Three variations of palm shell activated carbon media were used: Filter A: 1 cm, Filter B: 0.5 cm, Filter C: 0.2 cm, each with three repetitions per variation, which was then followed by inferential analysis.

Results: Descriptive analysis showed reductions in Fe and turbidity as follows: Filter A – Fe 1.22 mg/L and turbidity 43.97 NTU, Filter B – Fe 1.15 mg/L and turbidity 38.22 NTU, Filter C – Fe 1.27 mg/L and turbidity 43.97 NTU. The result of the *One-Way ANOVA* test showed that there was no significant effect of the variation in the particle size of activated carbon made from oil palm shell on the reduction of iron content and turbidity.

Conclusion: Palm shell activated carbon is effective in reducing iron (Fe) content and turbidity in well water.

Keywords: Iron (Fe), Turbidity, Palm shell activated carbon, Particle size

PENGARUH VARIASI UKURAN MEDIA ARANG AKTIF CANGKANG KELAPA SAWIT TERHADAP PENURUNAN KADAR BESI DAN KEKERUHAN PADA AIR SUMUR

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ABSRTAK

Latar Belakang: Air merupakan kebutuhan fundamental bagi manusia. Air harus memenuhi persyaratan kualitas dan kuantitas. Kadar besi dan kekeruhan yang melebihi baku mutu akan berdampak negatif bagi kehidupan. Upaya alternatif dalam penurunan kadar besi (Fe) dan kekeruhan yang melebihi baku mutu yakni menggunakan metode filtrasi menggunakan arang aktif cangkang kelapa sawit.

Tujuan: Mengetahui variasi ukuran media arang aktif cangkang kelapa sawit terhadap penurunan kadar besi (Fe) dan kekeruhan pada air sumur

Metode Penelitian: Penelitian *Quasi Eksperiment* dengan desain *Pre Test – Post Test Without Control Group.* Objek penelitian ini adalah air sumur yang berlokasi di Dusun Ngumbul, Tamanan, Bantul. Terdapat tiga variasi ukuran media arang aktif cangkang kelapa sawit, yaitu filter A: 1 cm, filter B:0,5cm, filter C:0,2 cm dengan masing-masing mendapat tiga pengulangan untuk setiap variasinya, yang kemudian dilanjutkan dengan analisis inferensial.

Hasil Penelitian: Secara deskriptif menunjukkan penurunan Fe dan kekeruhan pada filter A - Fe 1,22 mg/L dan kekeruhan 43,97 NTU, filter B - Fe 1,15 mg/L dan kekeruhan 38,22 NTU, filter C Fe 1,27 mg/L dan kekeruhan 43,97 NTU. Hasil dari uji *One Way Anova* bahwa tidak ada pengaruh variasi ukuran arang aktif cangkang kelapa sawit terhadap penurunan kadar Fe dan kekeruhan.

Kesimpulan: Arang aktif cangkang kelapa sawit mampu menurunkan kadar besi (Fe) dan kekeruhan pada air sumur.

Kata Kunci: Besi (Fe), Kekeruhan, Arang aktif cangkang sawit, Ukuran