

ABSTRAK

NANOPORI LIMBAH CANGKANG TELUR AYAM SEBAGAI PENETRAL AIR ASAM DAN PENYERAP LOGAM BERAT

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Latar Belakang: Cangkang telur ayam terdiri dari 94% CaCO_3 yang berfungsi sebagai adsorben dan penetral keasaman air. Penelitian ini bertujuan memanfaatkan limbah cangkang telur ayam menjadi bentuk nanopori sebagai adsorben logam berat dan penetral keasaman air.

Metodologi: Penelitian ini meliputi pembuatan nanopori serbuk cangkang telur ayam dengan berbagai formula, karakterisasi formula terpilih menggunakan SEM (*Scanning Electron Microscope*), uji performa, serta membandingkan kinerja nanopori cangkang telur ayam dengan karbon aktif pada air keran. Data disajikan secara deskriptif dalam bentuk karakteristik nanopori serbuk cangkang telur ayam hasil SEM, persentase nilai kemampuan penyerapan logam berat dan penetralan asam dengan EC meter dan pH meter.

Hasil Penelitian: Nanopori serbuk cangkang telur ayam formula 5 mampu menyerap logam berat dan menetralkan asam paling baik sebesar 40,2% dan 22,1%. Hasil performa terbaik yaitu pada jumlah serbuk 500 mg dan waktu pengadukan 120 detik. Kemampuan penyerapan logam berat dan penetralan asam mengalami penurunan 5 kali pemakaian berulang. Karakteristik SEM menunjukkan nanopori serbuk cangkang telur ayam memiliki pori berukuran nanopori (kurang dari 1 μm). Kemampuan penyerapan logam berat dan penetralan asam nanopori serbuk cangkang telur ayam lebih baik dibandingkan karbon aktif.

Kesimpulan: Nanopori limbah cangkang telur ayam dapat dimanfaatkan sebagai penyerap logam berat dan penetral keasaman air.

Kata Kunci: Nanopori, Adsorben, Cangkang Telur Ayam, Logam Berat, Asam

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ABSTRACT

NANOPOROUS OF CHICKEN EGGSHELL WASTE AS ACIDITY REMOVAL AND HEAVY METAL ADSORPTION IN WATER

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Background: Chicken eggshell contains 94% CaCO_3 that can be used as adsorbent and acidity removal in water. This research aims to utilize chicken eggshell waste in nanoporous form as heavy metal adsorption and acidity removal in water.

Methods: This study performed preparation of nanoporous chicken eggshell with various formulas, characterized using SEM (Scanning Electron Microscope), performance test, and ability comparison between activated carbon and nanoporous chicken eggshell. The result was presented descriptively in characteristic of nanoporous chicken eggshell using SEM and percentage value of the ability of heavy metal adsorption and acidity removal in water using EC meter and pH meter.

Results: Formula 5 nanoporous chicken eggshell can adsorb heavy metal and remove acidity in water by 40,2% and 22,1% sequently. The best performance test result was in 500 mg amount nanoporous powder and 120 seconds of stirring time. This ability was decreasing as 5 times repeated usage. SEM characterization showed that nanoporous chicken eggshell powder has nanopore-sized pore (less than 1 μm). Nanoporous chicken eggshell is better than activated carbon in adsorbing heavy metal and removing acid in water.

Conclusion: Nanoporous of chicken eggshell waste can be utilized as heavy metal adsorption and acidity removal in water.

Keywords: Nanoporous, Adsorbent, Chicken Eggshell, Heavy Metal, Acidity

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