ABSTRAK

Lylia Ayu Nanda

"EFEKTIVITAS DAN EFISIENSI ARANG AKTIF KULIT KEMIRI SEBAGAI ADSORBEN PENURUNAN KESADAHAN (CACO3) PADA AIR BERSIH"

xii + 70 halaman + 3 tabel + 2 Grafik + 4 gambar

Kandungan kesadahan (CaCO3) berlebih dalam air adalah salah satu masalah pencemaran air yang berada di masyarakat saat ini. Limbah kulit kemiri memiliki tekstur yang keras dan sulit diuraikan tetapi berpotensi sebagai bahan karbon aktif karena megandung kalor dan ligniosis yang tinggi. Tujuan penelitian ini adalah menganalisis efektifitas dan efisiensi penurunan kadar kesadahan sebelum dan sesudah perlakuan.

Metode penelitian pra-eksperimental. Variabel penelitian terdiri dari variabel bebas yaitu dosis bioadsroben kulit kemiri dan variabel terikat yaitu kadar kesadahan air baku rekayasa dengan variabel kontrol yaitu pH, luas permukaan (adsorben), waktu kontak, dan kecepatan pengadukan. Subjek penelitian dibagi menjadi 6 kelompok yakni 1 kontrol dan 5 perlakuan dengan replikasi sebanyak 4 kali menggunakan sampel air rekayasa ditambahkan arang aktif kulit kemiri yang telah diaktivasi menggunakan NaOH dengan variasi dosis 5gr/l, 10gr/l, 15gr/l, 20gr/l, dan 25gr/l diputar menggunakan jartest 90rpm selama 120menit. Analisis data dalam penelitian ini menggunakan uji anova.

Kadar kesadahan sebelum perlakuan sebesar 531,1mg/L dan setelah dilakukan penambahan arang aktif menghasilkan penurunan kesadahan terbesar terjadi pada penambahan dosis 25gr sebesar 207,5mg/L dan penurunan terendah terjadi pada penambahan dosis 5gr sebesar 386,7mg/L. Efektivitas berdasarkan nilai ambang batas dan dampak penggunaan air sadah <300mg/L terjadi pada penambahan karbon aktif 10gr, 15gr, 20gr, dan 25gr. Sedangkan efisiensi berdasarkan hasil perhitungan rumus efisien adsorpsi didapatkan bahwa penambahan karbon aktif 15gr lebih efisien karena dengan dosis tersebut sudah dapat menurunkan hingga 50% sehingga dapat menghemat pemakaian karbon aktif. Karbon aktif kulit kemiri dapat dijadikan bioadsorben dalam penurunan bahan pencemar lain dengan menggunakan metode jartest maupun filtrasi.

Kata Kunci : Air, Kesadahan (CaCO3), Kulit Kemiri
Daftar Bacaan : 22 Buku (2006-2020)

ABSTRAK

Lylia Ayu Nanda

"EFFECTIVENESS AND EFFICIENCY OF CANDLE SHELL AS ADSORBENT REDUCING HARDNESS (CACO3) IN CLEAN WATER"
xiii + 70 pages + 3 tables + 2 Charts + 4 Pictures

The content of excess hardness (CaCO3) in water is one of the problems of water pollution. In the society, it is still found that high hard water is used for daily needs and even consumption. Candlenut shell waste with a hard texture is difficult to decompose and has the potential to be used as activated carbon because of its high calorific and ligniosis content. The purpose of this study was to analyze the effectiveness and efficiency of reducing the level of hardness before and after treatment.

This research method was pre-experimental. The research variables consisted of independent variables, that is the dose of candlenut shell bioadsorbent and the dependent variable, that is the level of hardness of engineered raw water with control variables namely pH, Surface Area (adsorbent), Contact Time, and Stirring Speed. The research subjects were divided into 6 groups, that is 1 control and 5 treatments with 4 times replication using engineered water samples added with candlenut shell bioadsorbent which had been activated using NaOH, after that it was added with a dose variation of 5gr/l, 10gr/l, 15gr/l, 20gr/l, and 25gr/l were rotated using jartest 90rpm for 120 minutes. The data analysis in this study was used the ANOVA test.

The hardness level before treatment was 531.1mg/L and after the addition of activated carbon based on the variation of the dose used resulted in the largest decrease in hardness at an additional 25gr dose of 207.5mg/L and the lowest decrease in the addition of 5gr activated carbon dose of 386.7mg/L.

The effectiveness based on the threshold value and the impact of using hard water <300mg/L occurred with the addition of 10gr, 15gr, 20gr, and 25gr activated carbon. While the efficiency based on the calculation of the efficient adsorption formula, it was found that the addition of 15gr activated carbon was more efficient because with this dose it was able to reduce up to 50% so that it could save the use of activated carbon. Candlenut shell activated carbon can be used as a bioadsorbent in reducing other pollutants by using the jartest and filtration methods.

Key Word : Water, Hardness (CaCO3), Candle Sheel
Reading List : 22 Books (2006-2020)