CHARACTERISTICS ANALYSIS OF ADSORBENT FROM RUBBER TREE TRUNK AND RUBBER SEED SHELLS

Desi Nurandini [1), 2)*], Riani Ayu Lestari [1)], Arif Tirtana[1)], Muhammad Zeva Prayitno[1)], Isna Syauqiah [1), 2)]

[1)] Department of Chemical Engineering, Faculty of Engineering, Lambung Mangkurat University, Jl. A. Yani Km. 36, South Kalimantan, Indonesia

[2)] Wetland Based Materials Research Group, Lambung Mangkurat University, South Kalimantan, Indonesia

[*] E-mail corresponding author: desi.nurandini@ulm.ac.id

ARTICLE INFO

Article history:
Received: 25-10-2022
Received in revised form: 27-10-2022
Accepted: 28-10-2022
Published: 28-10-2022

Keywords:
Adsorption
Adsorbent
Rubber tree trunk
Rubber seed shells
Characterization

ABSTRACT

The efforts to control heavy metal waste are developingg to obtain an economical, effective, and efficient method. One method that is widely used in industry is adsorption. In general, the use of conventional adsorbents requires relatively more expensive operational and regeneration costs, thus it is necessary to investigate alternative adsorbents derived from nature. Local commodities that can be taken as the basic material for adsorbents are rubber plants. In the rubber seed shell there are fibers containing cellulose, hemicellulose, lignin, and waxes. The rubber tree trunk at the base has a relatively high cellulose content (67.38%), the middle part has a cellulose content of (59.37%) and the end part has a cellulose content of (45.73%). Therefore, this study was conducted to determine the potential of rubber stems and rubber seed shell waste to be processed into adsorbents. The making of the adsorbent is preceded by the delignification stage and then followed by the activation process. Based on the characterization tests that have been carried out, it is known that the moisture content in the biosorbent of the rubber seed and shell is 10% and 11%, while the ash content is 1.23% and 2.33%, respectively. The volatile matter levels for the adsorbents from the stems and shells were 6.43% and 6.18%, respectively..

ANALISIS KARAKTERISTIK ADSORBEN DARI BATANG DAN CANGKANG BIJI KARET

Abstrak- Upaya pengendalian limbah logam berat semakin berkembang untuk memperoleh metode yang ekonomis, efektif, dan efisien. Salah satu metode yang banyak dipakai dalam industri adalah adsorpsi. Pada umumnya penggunaan adsorben konvensional memerlukan biaya operasional dan regenerasi yang relatif lebih mahal, sehingga perlu investigasi adsorben alternatif yang berasal dari alam. Komoditas lokal yang dapat diambil sebagai bahan dasar adsorben adalah tanaman karet. Pada cangkang biji karet terdapat serat yang mengandung selulosa, hemiselulosa, lignin, dan *waxes*. Batang karet bagian pangkal memiliki kadar selulosa yang tergolong tinggi yaitu (67,38%), bagian tengah kadar selulosa sebesar (59,37%) dan bagian ujung kadar selulosa sebesar (45,73%). Oleh karena itu, penelitian ini dilakukan untuk mengetahui potensi batang karet dan limbah cangkang biji karet untuk diolah mnjadi adsorben. Pembuatan adsorben didahului dengan tahap delignifikasi dan kemudian dilanjutkan dengan proses aktivasi. Berdasarkan uji karakterisasi yang telah dilakukan, diketahui bahwa kadar air dalam biosorben batang dan cangkang biji karet adalah sebesar 10% dan 11%, sementara kadar abu masing-masing adalah sebesar 1,23% dan 2,33%. Kadar *volatile matter* untuk adsorben dari batang dan cangkang tersebut yaitu 6,43% dan 6,18%.

Kata kunci : adsorpsi, adsorben, batang karet, cangkang biji karet, karakterisasi