

ABSTRAK

PEMANFAATAN SERBUK KAYU MEDANG DALAM PEMBUATAN ADSORBEN UNTUK MENURUNKAN KADAR BESI (Fe) PADA PENGOLAHAN AIR GAMBUT

Air gambut umumnya memiliki kandungan besi (Fe) yang tinggi sehingga memerlukan pengolahan sebelum digunakan. Penelitian ini bertujuan untuk mengetahui pengaruh aktivator H_3PO_4 dan KOH terhadap karakteristik karbon aktif serbuk kayu medang serta kemampuannya dalam menurunkan kadar Fe pada air gambut. Karbon aktif melalui proses karbonisasi pada suhu 400°C selama 1 jam dan diaktivasi menggunakan larutan H_3PO_4 1 M dan KOH 1 M. Proses adsorpsi dilakukan secara kontinyu menggunakan kolom adsorpsi dengan variasi massa adsorben 4 g dan 8 g serta waktu kontak 20–100 menit. Karakteristik karbon aktif dianalisis kadar air, kadar abu, dan daya serap iodin sesuai SNI 06-3730-1995. Hasil menunjukkan bahwa karbon aktif teraktivasi KOH memiliki karakteristik terbaik dengan kadar air 4,62%, kadar abu 2,97%, dan daya serap iodin 1067,48 mg/g. Namun, karbon aktif teraktivasi H_3PO_4 memberikan kinerja adsorpsi Fe yang lebih baik dengan efisiensi penurunan sebesar 98,33% pada massa adsorben 8 g dan waktu kontak 100 menit, serta kapasitas adsorpsi tertinggi sebesar 165,12 mg/g pada massa adsorben 4 g. Selain itu, proses adsorpsi mampu meningkatkan pH serta menurunkan nilai TDS dan konduktivitas air gambut. Dengan demikian, karbon aktif serbuk kayu medang berpotensi sebagai adsorben yang efektif untuk pengolahan air gambut.

Kata kunci: karbon aktif, serbuk kayu medang, adsorpsi, besi (Fe), air gambut.

ABSTRACT

UTILIZATION OF MEDANG WOOD POWDER IN MAKING ADSORBENTS TO REDUCE IRON (Fe) LEVELS IN PEAT WATER PROCESSING

Peat water generally has a high iron (Fe) content so it requires treatment before use. This study aims to determine the effect of H_3PO_4 and KOH activators on the characteristics of activated carbon from medang sawdust and its ability to reduce Fe levels in peat water. Activated carbon went through a carbonization process at a temperature of 400°C for 1 hour and was activated using a solution of H_3PO_4 1 M and KOH 1 M. The adsorption process was carried out continuously using an adsorption column with variations in adsorbent mass of 4 g and 8 g and a contact time of 20–100 minutes. The characteristics of activated carbon were analyzed for water content, ash content, and iodine absorption capacity according to SNI 06-3730-1995. The results showed that KOH-activated activated carbon had the best characteristics with a water content of 4.62%, ash content of 2.97%, and iodine absorption capacity of 1067.48 mg/g. However, H_3PO_4 activated carbon provided better Fe adsorption performance with a reduction efficiency of 98.33% at an adsorbent mass of 8 g and a contact time of 100 minutes, and the highest adsorption capacity of 165.12 mg/g at an adsorbent mass of 4 g. Furthermore, the adsorption process was able to increase the pH and reduce the TDS and conductivity of peat water. Thus, activated carbon from medang sawdust has the potential to be an effective adsorbent for peat water treatment.

Keywords: *activated carbon, medang sawdust, adsorption, iron (Fe), peat water.*