

PREPARASI DAN KARAKTERISASI KARBON AKTIF DARI KOMBINASI CANGKANG KELAPA SAWIT DAN KEMIRI SEBAGAI ADSORBEN PADA LIMBAH TEKSTIL INDUSTRI BATIK

ABSTRAK

Telah dilakukan penelitian preparasi dan karakterisasi karbon aktif dari kombinasi cangkang kelapa sawit dan kemiri sebagai adsorben pada limbah tekstil industri batik. Tahapan penelitian ini meliputi pembuatan karbon aktif dari kombinasi cangkang kelapa sawit dan kemiri dengan proses pembakaran pada temperatur 600 °C selama 2 jam dalam tanur, kemudian diaktivasi secara kimia dengan larutan H₃PO₄ 4 M selama 24 jam. Karbon aktif selanjutnya dianalisis fisik seperti kadar air, kadar abu, kadar zat menguap, kadar karbon terikat dan daya serap yodium yang dilakukan berdasarkan SNI No 06-3730-1995. Pada penelitian ini diperoleh hasil karakterisasi fisik dari karbon aktif kombinasi cangkang kelapa sawit dan kemiri seperti kadar air, kadar abu, kadar zat menguap, kadar karbon terikat, dan daya serap yodium berturut-turut yaitu 4,32% ; 3,44% ; 3,16% ; 93,40% dan 594 mg/g. Kadar Bilangan BOD, COD, TSS, dan pH pada limbah tekstil industri batik dengan dan tanpa penambahan karbon aktif sudah memenuhi persyaratan yang ditetapkan oleh Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.16/MENLHK/SETJEN/KUM.1/4/2019, hal ini dapat dibuktikan dari kadar bilangan BOD, COD, TSS, dan pH berturut-turut adalah 2,1 mg/L ; 7,5 mg/L ; 8,6 mg/L dan pH sebesar 9,89. Setelah penambahan karbon aktif menjadi 2,0 mg/L ; 6,6 mg/L ; 4,9 mg/L dan pH sebesar 8,15.

Kata Kunci : Karbon Aktif, Cangkang Kelapa Sawit dan Kemiri, Adsorben, Limbah Tekstil Industri Batik

**PREPARATION AND CHARACTERIZATION OF ACTIVATED
CARBON FROM THE COMBINATION OF OIL PALM SHELLS AND
PLANTS AS ADSORBENT IN TEXTILE WASTE OF BATIK
INDUSTRY**

ABSTRACT

Research has been carried out on the preparation and characterization of activated carbon from a combination of oil palm shells and candlenut as an adsorbent in textile waste from the batik industry. The stages of this research include the manufacture of activated carbon from a combination of palm kernel shells and candlenut with a combustion process at a temperature of 600 °C for 2 hours in a kiln, then chemically activated with a 4 M H₃PO₄ solution for 24 hours. The activated carbon was then analyzed physically such as water content, ash content, volatile matter content, bound carbon content and iodine absorption which was carried out based on SNI No. 06-3730-1995. In this study, the results of the physical characterization of activated carbon combined with oil palm shells and candlenut were obtained such as water content, ash content, volatile matter content, bound carbon content, and iodine absorption, respectively, namely 4.32%; 3.44% ; 3.16% ; 93.40% and 594 mg/g. The levels of BOD, COD, TSS, and pH numbers in the textile waste of the batik industry with and without the addition of activated carbon have met the requirements set by the Regulation of the Minister of Environment and Forestry Number P.16/MENLHK/SETJEN/KUM.1/4/2019, this can be proven from the levels of BOD, COD, TSS, and pH numbers are 2,1 mg/L, respectively; 7.5 mg/L ; 8.6 mg/L and a pH of 9.89. After the addition of activated carbon to 2.0 mg/L ; 6.6 mg/L; 4.9 mg/L and a pH of 8.15.

Keywords : *Activated charcoal, oil palm shells and candlenut, Adsorbent, Batik Industry Textile Waste*