ABSTRAK

PENGARUH KONSENTRASI $MgCl_2$ DAN WAKTU AKTIVASI TERHADAP KUALITAS KARBON AKTIF BAMBU AUR (*Bambusa vulgaris*) SEBAGAI ADSORBEN LOGAM BERAT TEMBAGA (Cu)

Shabrina Amalia Kartika, 2026, 66 halaman, 13 tabel, 54 gambar, 4 lampiran

Pencemaran logam berat tembaga (Cu) akibat limbah industri merupakan permasalahan lingkungan yang memerlukan penanganan efektif dan berkelanjutan. Adsorpsi menggunakan karbon aktif merupakan salah satu metode yang dinilai efisien dan ekonomis untuk mengatasi permasalahan tersebut. Penelitian ini bertujuan untuk mensintesis karbon aktif dari bambu aur (*Bambusa vulgaris*) menggunakan aktivator $MgCl_2$, serta mengkaji pengaruh variasi konsentrasi $MgCl_2$ dan waktu aktivasi terhadap kualitas karbon aktif yang dihasilkan dan efektivitasnya dalam mengadsorpsi ion logam tembaga (Cu). Kualitas karbon aktif yang dihasilkan diuji berdasarkan standar SNI No. 06-3730-1995. Hasil pengujian menunjukkan bahwa seluruh sampel memenuhi persyaratan SNI, dengan nilai kadar air berkisar 3% – 7%, kadar abu 2% – 4%, kadar zat menguap 15% – 19%, kadar karbon terikat 76% – 81%, dan daya serap iodin 812 – 926 mg/g. Kondisi adsorpsi optimum diperoleh pada konsentrasi $MgCl_2$ 15% dengan waktu aktivasi 24 jam, yang menghasilkan kadar Cu tersisa sebesar 9,3270 mg/L dan efisiensi penyerapan sebesar 69,8633%. Berdasarkan hasil penelitian, karbon aktif berbahan dasar bambu aur yang diaktivasi dengan $MgCl_2$ berpotensi dimanfaatkan sebagai adsorben logam berat Cu yang ramah lingkungan dan bernilai ekonomis.

Kata kunci: Bambu Aur, Aktivator $MgCl_2$, Karbon Aktif, Adsorpsi, Tembaga (Cu).

ABSTRACT

THE EFFECT OF $MgCl_2$ CONCENTRATION AND ACTIVATION TIME ON THE QUALITY OF ACTIVATED CARBON FROM AUR BAMBOO (Bambusa vulgaris) AS AN ADSORBENT FOR THE HEAVY METAL COPPER (Cu)

Shabrina Amalia Kartika, 2026, 66 *pages*, 13 *tables*, 54 *figures*, 4 *appendices*

Copper (Cu) heavy metal pollution from industrial waste is an environmental problem that requires effective and sustainable management. Adsorption using activated carbon is considered one of the most efficient and economical methods to address this issue. This study aimed to synthesize activated carbon from aur bamboo (Bambusa vulgaris) using $MgCl_2$ as an activator, and to examine the effect of $MgCl_2$ concentration variation and activation time on the quality of the resulting activated carbon and its effectiveness in adsorbing copper (Cu) metal ions. The $MgCl_2$ concentrations used were 5%, 10%, 15%, 20%, and 25% with activation times of 24 hours and 48 hours. The quality of the resulting activated carbon was tested based on SNI No. 06-3730-1995. The test results showed that all samples met the SNI requirements, with moisture content ranging from 3% – 7%, ash content 2% – 4%, volatile matter content 15% – 19%, fixed carbon content 76% – 81%, and iodine adsorption capacity 812 – 926 mg/g. The optimum adsorption conditions were obtained at an $MgCl_2$ concentration of 15% with an activation time of 24 hours, yielding a residual Cu content of 9,3270 mg/L and an adsorption efficiency of 69,8633%. Based on the results, $MgCl_2$-activated aur bamboo-based activated carbon has potential as an environmentally friendly and economically viable heavy metal Cu adsorbent.

Keywords: *Aur Bamboo, $MgCl_2$ Activator, Activated Carbon, Adsorption, Copper (Cu).*