

DAYA SERAP IODIN ARANG AKTIF CANGKANG KEMIRI (*Aleurites moluccanus* (L.) Willd.) DENGAN VARIASI SUHU DAN WAKTU PEMANASAN DALAM PROSES AKTIVASI *HYBRID* BERBASIS *MICROWAVE HEATING*

INTISARI

Oleh:

Nina Amelia

21/473556/TP/13064

Limbah cangkang kemiri (*Aleurites moluccanus* (L.) Willd.) memiliki potensi sebagai bahan baku arang aktif karena kandungan ligninnya yang tinggi. Penelitian ini menganalisis pengaruh suhu (600°C, 700°C, 800°C) dan waktu pemanasan (15, 30, 45 menit) terhadap daya serap iodin arang aktif setelah proses aktivasi hybrid. Arang terlebih dahulu diaktivasi secara kimia menggunakan larutan KOH 5M selama 24 jam, kemudian diaktivasi secara fisika melalui *microwave heating* dengan variasi suhu dan waktu yang telah ditentukan. Data dianalisis menggunakan uji ANOVA satu arah dan dua arah untuk mengevaluasi pengaruh suhu, waktu pemanasan, dan metode aktivasi terhadap daya serap iodin. Hasil penelitian menunjukkan bahwa aktivasi hybrid pada suhu 700°C selama 15 menit menghasilkan daya serap iodin tertinggi (513,361 mg/g) dengan luas permukaan spesifik sebesar 510,619 m²/g. Hasil uji ANOVA menunjukkan bahwa waktu pemanasan serta interaksi antara suhu, waktu, dan metode aktivasi berpengaruh signifikan terhadap daya serap iodin. Analisis proksimat menunjukkan bahwa arang aktif dari limbah cangkang kemiri memiliki kadar air 8,79%, kadar abu 16,166%, kadar zat terbang 16,105%, dan kadar karbon terikat 59%.

Kata kunci: Arang aktif, metode *hybrid*, *microwave heating*, cangkang kemiri

IODINE ADSORPTION CAPACITY OF ACTIVATED CHARCOAL FROM CANDLENUT SHELLS (*Aleurites moluccanus* (L.) Willd.) WITH VARIATIONS IN TEMPERATURE AND HEATING DURATION IN A MICROWAVE HEATING-BASED HYBRID ACTIVATION

ABSTRACT

By:

Nina Amelia

21/473556/TP/13064

Candlenut shell waste (*Aleurites moluccanus* (L.) Willd.) has potential as a raw material for activated charcoal due to its high lignin content. This study analyzes the effect of temperature (600°C, 700°C, 800°C) and heating time (15, 30, 45 minutes) on the iodine adsorption capacity of activated charcoal after the hybrid activation process. The charcoal was first chemically activated using a 5M KOH solution for 24 hours, followed by physical activation through microwave heating with the specified temperature and time variations. Data were analyzed using one-way and two-way ANOVA to evaluate the effects of temperature, heating time, and activation method on iodine adsorption capacity. Results showed that hybrid activation at 700°C for 15 minutes produced the highest iodine adsorption (513.361 mg/g) with a specific surface area of 510.619 m²/g. ANOVA results indicated that heating time and the interaction between temperature, time, and activation method significantly influenced iodine adsorption. Proximate analysis showed that activated charcoal from candlenut shell waste contained 8.79% moisture, 16.166% ash, 16.105% volatile matter, and 59% fixed carbon.

Keywords: activated carbon, microwave heating, hybrid activation, candlenut shell