

# SINTESIS DAN KARAKTERISASI KARBON AKTIF SEKAM PADI TERAKTIVASI HCl

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## ABSTRAK

Penelitian ini bertujuan untuk melakukan sintesis dan karakterisasi karbon aktif sekam padi teraktivasi HCl dengan menggunakan metode aktivasi fisika-kimia. Penelitian ini merupakan jenis penelitian eksperimen deskriptif kuantitatif yang dilaksanakan di Laboratorium Kimia Anorganik Universitas Pendidikan Ganesha. Adapun tahapan dalam penelitian ini terdiri dari tiga tahapan, yakni preparasi alat dan bahan, sintesis karbon aktif sekam padi, dan karakterisasi karbon aktif sekam padi. Data yang dikumpulkan yaitu data struktur kristal dengan menggunakan alat ukur XRD, dan data morfologi, sebaran unsur dan ukuran partikel dari karbon aktif dilakukan dengan karakterisasi dari SEM-EDX. Data penelitian kemudian dianalisis secara kualitatif dan kuantitatif. Hasil sintesis diperoleh serbuk karbon aktif sekam padi. Hasil uji XRD menunjukkan puncak difraksi muncul pada  $2\theta = 22,23^\circ$  yang tidak memiliki puncak runcing atau tajam yang menandakan karbon aktif memiliki struktur amorf. Hasil uji SEM menunjukkan morfologi karbon aktif sekam padi yang memiliki bentuk partikel bulat dengan distribusi ukuran partikel 20-70 nm. Hasil uji EDX menunjukkan karbon aktif sekam padi didominasi oleh unsur C, O dan Si berturut-turut sebesar 54,31%, 40,04% dan 2,49%.

**Kata kunci:** sintesis, karakterisasi, karbon aktif, sekam padi.

# **Synthesis and Characterization of Rice Husk Activated Carbon by HCl Activation**

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## **ABSTRACT**

*The suboptimal utilization of rice husk waste has prompted researchers to attempt utilizing it as activated carbon, which holds the potential for development in the industrial sector; thereby enhancing its economic value. This study focuses on synthesizing and characterizing activated carbon from rice husk activated with HCl. In this research, the synthesis of activated carbon was carried out using a physics-chemical activation method. It began with washing the rice husk samples with regular water, followed by air drying. Subsequently, the dried rice husks were carbonized to produce charcoal, which was then finely ground. The rice husk powder was further activated through physical activation at a temperature of 500°C. The physically activated product was then subjected to chemical activation using 6M HCl with a charcoal-to-activator ratio of 1:10 (m/V). The mixture was stirred at 250 rpm for 1 hour and then allowed to settle for 24 hours. Afterward, it was washed and dried to obtain the activated carbon powder. XRD analysis revealed diffraction peaks at  $2\theta = 22.23^\circ$ , indicating that the activated carbon has an amorphous structure without sharp peaks. SEM results showed the morphology of rice husk activated carbon with spherical particle shapes and a particle size distribution of 20-70 nm. EDX analysis indicated that the rice husk activated carbon is predominantly composed of carbon (54.31%), oxygen (40.04%), and silicon (2.49%).*

**Keyword:** *synthesis, characterization, activated carbon, rice husk.*