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**PREPARATION OF ACTIVATED CARBON DERIVED FROM RICE HUSK WITH
NaOH AND KOH ACTIVATION AGENT FOR REMOVAL OF HEAVY METAL IN
AGRICULTURAL RUNOFF**

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NaOH AND KOH ACTIVATION AGENT FOR REMOVAL OF HEAVY METAL IN
AGRICULTURAL RUNOFF**

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ABSTRACT

The rising concern over heavy metal contamination, particularly in agricultural runoff, has driven the development of sustainable and low-cost water treatment materials. This study explores the production of rice husk-derived activated carbon (RHAC) using two chemical activation agents which are sodium hydroxide (NaOH) and potassium hydroxide (KOH) as chemical activation agents to enhance heavy metal removal efficiency. This research aims to optimize the preparation of activated carbon from rice husk using KOH and NaOH activation to enhance its efficiency in removing heavy metals from agricultural runoff, offering a sustainable solution to both waste management and environmental pollution. Rice husk, an abundant agricultural byproduct, was carbonized and chemically activated to produce porous and functionalized activated carbon. Key parameters, including surface functional groups and adsorption performance were characterized using Fourier Transform Infrared Spectroscopy (FTIR) and Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). The adsorption experiment demonstrated that KOH-activated RHAC exhibited higher removal efficiencies for lead (Pb) and cadmium (Cd) at 65.7% and 85.0% respectively, attributed to the presence of stronger carbonyl and hydroxyl functional groups. Conversely, NaOH-activated RHAC showed better performance in copper (Cu) adsorption at 60.0% removal percentage. Meanwhile chromium (Cr) and zinc (Zn) results indicated variability due to possible desorption or competitive interactions. This study highlights the influence of activation agents on RHAC's physicochemical properties and adsorption behavior. These findings highlight the potential of rice husk's potential as a renewable precursor for activated carbon production alongside its applicability in the treatment of wastewater containing heavy metal like in agricultural runoff water. This research promotes waste valorization and environmentally sustainable water purification.

siswa yang mengandung logam berat seperti dalam air limbah pertanian. Penelitian ini menggalakkan penguatan siswa dan pembersihan air mampan alam sekitar.

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