

**PENGARUH SONIKASI DAN PELINDIAN PADA LEMPUNG BUKIT ACE
DALAM PENINGKATAN EFISIENSI PENYERAPAN
BAHAN ORGANIK TERLARUT (BOT) DAN Fe PADA AIR GAMBUT**

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ABSTRACT

EFFECT OF SONICATION AND LEACHING ON ACE HILL CLAY IN ENHANCING THE ADSORPTION EFFICIENCY OF DISSOLVED ORGANIC MATTER (DOM) AND Fe IN PEAT WATER

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Clay is a mineral distributed almost evenly throughout Indonesia. It has a high adsorption capacity due to its large cation exchange capacity and specific surface area. Thus, clay has great potential as an adsorbent. This study evaluates the effectiveness of Bukit Ace clay from Gunung Sarik Padang, modified by sonication and leaching with oxalic acid, as an adsorbent for separating Dissolved Organic Matter (DOM) and reducing the iron content in peat water. The clay was modified through three treatment methods before being used as an adsorbent: heating (H-clay), sonication for varying durations (30, 60, and 90 minutes) (S-clay), and leaching (SL-clay). Characterization using XRF, XRD, FTIR, and optical microscope showed that sonication for 90 minutes significantly increased particle dispersion, as indicated by larger basal spacing values, larger particle size, and a lower crystalline percentage. This suggests a more amorphous structure, which is expected to absorb more DOM and Fe in peat water. Leaching increased the clay's SiO_2 content and successfully reduced its Fe_2O_3 levels, but it also decreased its Al_2O_3 levels, which differs from previous research results. Batch adsorption tests showed that S-clay sonicated for 90 minutes at a mass of 5 g and a contact time of 180 minutes exhibited the highest performance. This sample had removal efficiencies of 90.07% for DOM and 100% for Fe based on UV-Vis spectrophotometry measurements for DOM and AAS measurements for Fe. Therefore, it can be concluded that clay modified through sonication exhibits the most potential adsorption performance.

Keywords: *adsorption, clay, peat water, sonication, leaching, DOM, Fe*