

**PENGARUH WAKTU SONIKASI DAN PENGADUKAN PADA
PREPARASI *BIOCHAR* DARI KULIT SINGKONG (*Manihot Esculenta
Crantz*) TERMODIFIKASI MAGNETIT (Fe_3O_4) DAN SURFAKTAN
SODIUM DODECYL BENZENE SULFONATE (SDBS) SEBAGAI
ADSORPSI LIMBAH METILEN BIRU**

INTISARI

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Penelitian pada *biochar* kulit singkong modifikasi Fe_3O_4 dan surfaktan SDBS (*biochar* hibrida) yang digunakan sebagai adsorben limbah metilen biru berhasil dilakukan.. *Biochar* dari kulit singkong dibuat dengan proses pirolisis lalu diaktivasi dengan penambahan H_3PO_4 . *Biochar* dimodifikasi menggunakan prekursor $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ dan $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ untuk pembentukan Fe_3O_4 dan surfaktan SDBS dengan variasi waktu sonikasi optimum 120 menit dan waktu pengadukan optimum 24 jam. Hasil analisis FTIR terdapat gugus Fe-O dan S=O pada *biochar* hibrida. Hasil uji XRD terdapat puncak difraksi oksida besi pada sudut $30,406^\circ$; $35,535^\circ$; $42,967^\circ$; $57,195^\circ$; $62,773^\circ$. Hasil SEM-EDX morfologi dari *biochar* hibrida terdapat gumpalan putih dari Fe_3O_4 dan surfaktan SDBS. Hasil uji adsorpsi didapatkan massa optimum dari *biochar* hibrida sebagai adsorben limbah metilen biru yaitu 0,1 gram dengan persen adsorpsi 99,59% dan pH pada larutan metilen biru optimum pada pH 2 dengan persen adsorpsi sebesar 98,88%.

Kata Kunci : Adsorpsi, *biochar*, Kulit Singkong, Magnetit, SDBS, Sonikasi, Pengadukan

**THE EFFECT OF SONICATION AND SHAKER TIME ON BIOCHAR
PREPARATION FROM CASSAVA PEELS (*Manihot Esculenta Crantz*)
MODIFICATION OF MAGNETITE (Fe₃O₄) AND SURFACTANT SODIUM
DODECYL BENZENE SULFONATE (SDBS) AS METHYLENE WASTE
ADSORPTION**

ABSTRACT

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Research on cassava peel biochar modified Fe₃O₄ and SDBS surfactant (hybrid biochar) which was used as an adsorbent for methylene blue waste was successfully carried out. Biochar from cassava peel was made by pyrolysis process and then activated by the addition of H₃PO₄. Biochar was modified using FeCl₃.6H₂O and FeSO₄.7H₂O precursors for the formation of Fe₃O₄ and SDBS surfactant with optimum sonication time variation of 120 minutes and optimum stirring time of 24 hours. The results of the FTIR analysis contained Fe-O and S=O groups in the hybrid biochar. The results of the XRD test showed that the diffraction peak of iron oxide was at an angle of 30.406°; 35.535°; 42,967°; 57,195°; 62.773°. The results of SEM-EDX morphology of the hybrid biochar showed white clumps of Fe₃O₄ and SDBS surfactant. The results of the adsorption test showed that the optimum mass of hybrid biochar as an adsorbent for methylene blue waste was 0.1 grams with an adsorption percentage of 99.59% and the optimum pH in methylene blue solution was at pH 2 with an adsorption percentage of 98.88%.

Keywords: Adsorption, biochar, Cassava Peel, Magnetite, SDBS, Sonication, Pengadukan