

Synthesis and application of SiO₂ from Black Bamboo (*Gigantochloa atrovioleacea*) leaf in Congo Red photodegradation

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ABSTRACT

*Silica nanoparticles was prepared from black bamboo (*Gigantochloa atrovioleacea*) leaf. The product then impregnated to CuO photocatalyst (0,25% CuO_x@SiO₂) and studied in congo red degradation. SiO₂ produced from the ash of black bamboo leaves through a calcination at 800°C for 6 hours. The result of 0,25% CuO_x@SiO₂ which characterized by UV-Vis diffuse reflectance, and its adsorption activity was carried out in the dark condition, while the photocatalytic activity test to congo red degradation was performed under UV-Vis light. UV-Vis diffuse reflectance shows that band gap energy of 0,25% CuO_x@SiO₂ compound is 4,269 eV. The adsorption data indicated the applicability of Freundlich adsorption isotherm with adsorption capacity value 2011,731425mol/gram and reaction kinetic of the degradation is in the second-order with reaction rate 0.010464.C² under UV light and 0.010481.C² under visible light.*

Kata Kunci: *nanoparticles, SiO₂, impregnation, photocatalyst, degradation, congo red*