# Improved removal of copper ions from aquoeus solution using NaOH-Pretreated coco peat



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Abstrak

This study aims to analyze the effect of chemical pretreatment using sodium hydroxide (NaOH) on the capacity of coco peat in removing of copper (11) ions from aqueous solutions. The effects of varying the molarity of NaOH, the solution pH, initial Cu(II) concentration, coco peat dosage and contact time were studied in batch experiment. The result of the preliminary pretreatment study shows that treatment with 0.5M NaOH greatly enhanced the metal sorption capacity of raw coco peat. The uptake capacity for Cu of the raw coco peat was increased from 46% to 83% at pH 4.0 and from 15% to 27% uptake for initial solution pH of 2.4. The results showed that the removal rate is directly proportional to pH, coco peat’s dosage and contact time and inversely proportional to Cu(Il) concentration. The adsorption process is best explained by the Langmuir isotherm than the Freundlich isotherm, indicating monolayer adsorption on a homogenous surface. The rate of reaction follows the pseudo-second order kinetic model, signifying that chemisorption is the rate limiting mechanism. The results of the Fourier Transform Infra-Red (FTIR) analysis indicated that the main functional groups involved in the sorption of copper to NaOH pretreated coco peat are the hydroxyl, carboxyl and phenolic groups. Based on the results of this study, it was found that pretreating coco peat with NaOH significantly improve the overall efficiency of coco peat in removing Cu(II) by adsorption process.