Comparison of the Copper Removal Process from Aqueous Solutions by Saw dust, Zeolite and Activated Carbon

Abstract:

Level of industrialization and increasing urbanization communities has been cause new problems and different ecological, so the environment is more important. Urban and industrial sewage is a problem with metal ions of environmental concern. This rare mineral pollutant due to the irresolvable nature, high toxicity, cumulative effects are considered. Sewage discharge not only contains heavy metals and other aquatic life is poisonous creatures. Natural waters but also for drinking purposes and agriculture is makes inappropriate. In this study, absorbent sawdust and zeolite to remove copper ions aqueous was used. First tests on the solution pH in water temperature laboratory, far away in 150 rpm, concentration of 10 mg per liter, contact time 12 hours and rang was from pH 2 to 9 for the three sorbent, pH optimum for sawdust, zeolite and activated carbon, respectively 6, 6 and 4 were assigned, then test ware related absorption kinetics. Test results showed that with increased contact time increases the efficiency of copper absorption and after the time the balance will remain almost constant. The balance for the concentration of copper input 1, 10, 20, 50, 100 and 300 mg /l obtained respectively of absorbent sawdust 25, 60, 90, 110, 70 and 45 minutes, for zeolite in 20, 50, 80, 100, 60 and 45 minutes and activated carbon in 20, 40, 60, 70, 50 and 45 minutes. Copper for maximum efficiency remove sawdust, zeolite and activated carbon input concentration of 1 mg /L, obtained respectively 96.11, 96.2 and 97.02, kinetic model Ho et al (1996) and Lagergrn (1893) the kinetic data were fitted three catchy and all that the three absorbing data model, Ho et al better described experiments, test of Langmuir laboratory temperature and pH were optimized, test results is showed that the model fit better than the isotherm Freundlich. In this study was to reduce the initial concentration of solution 1 mg to 50 mg/ L absorption efficiency difference between the three sorbent is between them and efficiency of absorption is approximately equal to and increasing initial concentration solution of copper from 50 to 300 mg/ l efficiency of absorption is equal. Another result was convergence time equilibrium absorption low concentration was high and thus reducing the initial concentration of solution 1 mg to 50 mg / l time to reach equilibrium capture all three sorbent was reduced so that the concentration of 1 mg / l The balance will converge for three absorbents and initial concentration of solution increased from 50 to 300 mg / l for all three sorbent equilibrium time decreased so that concentrations of 300 mg /L balance time was for three sorbent for the same and equal 45 minutes.

Keywords: Absorption, Copper, Sawdust, Zeolite, Activated carbon, Kinetics, Isotherms

University of Zabol
Graduate School
Faculty of Agriculture
Department of Irrigation & Drainage

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Supervisor:
Dr. Z. Shamohamadi heidari

Advisor:
Dr.M.Khajeh

By:
S.Jamali paghaleh

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