

## **INTERACTION OF AQUEOUS Cu(II) AND Pb(II) SPECIES WITH FIRED MUTHURAJAWELA PEAT**

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Peat consists of humic substances, fulvic acids, clay materials, organic compounds and minerals, and consequently, heat treatment of peat produces characteristics, such as enhanced adsorption capacity for metal ions, different from those of unfired (raw) peat. The extent of removal of Cu(II) and Pb(II) individually determined by treatment of 50.0 cm<sup>3</sup> of 10.0 ppm solutions of each metal with 5.00 g (d < 1 mm) of Muthurajawela peat (MP) fired at temperatures up to 700° C, indicates that a firing temperature of 200° C is the optimum for both metals. Lower firing temperatures are not suitable, as pores are not sufficiently exposed, while higher firing temperatures lead to combustion of organic matter restricting complexation with Cu(II) ions. Investigation of the variation of shaking time and settling time on the extent of Cu(II) removal by MP fired at 200° C leads to optimum values of 150 min and 60 min, respectively, while corresponding values for Pb(II) are 60 min and 30 min, respectively. The extents of removal of Cu(II) and Pb(II) under optimum conditions of shaking time, settling time and firing temperature are determined to be 160 mg kg<sup>-1</sup> and 190 mg kg<sup>-1</sup>, respectively. Furthermore, the Langmuir and Freundlich adsorption isotherm analyse of Cu(II) solutions within the range from 2 ppm to 1000 ppm at different solution temperatures lead to the applicability of both isotherms with high regression coefficients, while Pb(II) does not follow any isotherm model. Further, leachates of peat are found to contain high concentrations of sulphate and chlorides, which would form precipitates with Pb(II) leading to its removal from solution.

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