

Studies on natural biogenic iron oxides for removal of copper (II) ion from aqueous solution

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ABSTRACT

In the past few decades, presence of heavy metals such as copper has increased in the environment due to its industrial applications. Therefore, it is important to remove copper metal ions from water and wastewater so as to restrict it upto desired limits. This can be achieved by cost effective adsorption method on natural biogenic iron oxides as an adsorbent. Both forms of natural biogenic iron oxides i.e. banded iron formation (BIF) and iron plaque of *Typha-latifolia* have been characterized by environmental scanning electron microscopy (ESEM) and energy-dispersive X-ray spectroscopy (EDX). In the present study, the influence of adsorbent dose, the initial Cu(II) concentration and contact time for the removal of Cu(II) from aqueous solution has been ascertained. The present study reveals that BIF form of natural biogenic iron oxide showed higher removal potential compared to iron plaque particle of *Typha-latifolia*. The maximum sorption efficiency was found to be 88.65% at 30 g/L adsorbent dose. The Freundlich isotherm best fitted with (R^2) value of 0.999 are compared with Langmuir and Redlich-Peterson adsorption isotherms. The Pseudo first order kinetics rate reaction has been fitted to describe the batch kinetics of the Cu(II) uptake by BIF.

Keywords: Adsorption; Copper (II); Banded iron formation (BIF); Iron plaque of *Typha-latifolia*

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