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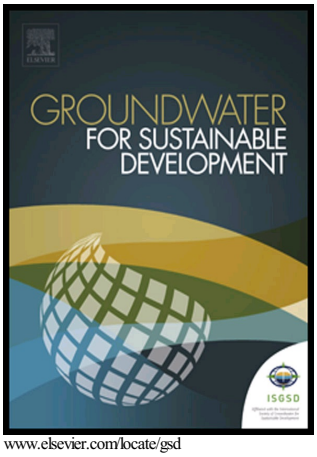

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Abstract

Ecofriendly bionanocomposite were fabricated and applied as an adsorbent for scavenging Pb(II), Cu(II) and Ni(II) from aqueous solution by batch adsorption studies. Structural characterization were successfully conducted using SEM, EDX, FTIR, XRD and TGA-DTG analysis. The effect of contact time and pH were investigated indicating maximum adsorption were achieved at pH 4,5 and 4; and contact time 60 min, 60 min and 120 min, for Pb(II), Cu(II) and Ni(II), respectively. The point of zero charge for bionanocomposite was found to be 7.5. Adsorption isotherm data were reliably described by the Langmuir model for all metal ions at the temperature range (303-323K). The monolayer adsorption capacity increases with increasing temperature. The monolayer adsorption capacity at 323K for Pb(II), Cu(II) and Ni(II) were 530.54, 177.2 and 51.48 mgg^{-1}, respectively. The thermodynamic analysis revealed that the adsorption of metal ions onto bionanocomposite was spontaneous and endothermic with increased randomness at solid/liquid interface. Desorption was best described by HCl for all