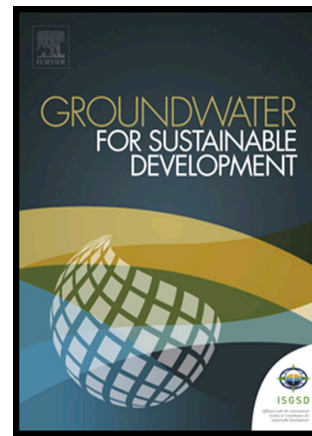


Author's Accepted Manuscript

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www.elsevier.com/locate/gsd

PII: S2352-801X(17)30023-1
DOI: <http://dx.doi.org/10.1016/j.gsd.2017.06.004>
Reference: GSD56

To appear in: *Groundwater for Sustainable Development*

Received date: 3 March 2017
Revised date: 25 May 2017
Accepted date: 15 June 2017

Cite this article as: Soumya Banerjee, Sanghamitra Barman and Gopinath Halder Sorptive elucidation of rice husk ash derived synthetic zeolite toward deionization of coalmine waste water: A comparative study, *Groundwater for Sustainable Development*, <http://dx.doi.org/10.1016/j.gsd.2017.06.004>

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Sorptive elucidation of rice husk ash derived synthetic zeolite towards deionization of coalmine waste water: A comparative study

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Abstract

Synthetic zeolite (Z-RHA) produced from rice husk ash was used as adsorbent for decontaminating Fe (II), Cu (II) and As (V) laden aqueous solution. Impact of influential parameters viz. pH (1 to 7), adsorbent dose (0.03 to 1 g/L), initial adsorbate concentration (1 to 100 mg/L), agitation speed (100 to 180 rpm), temperature (15 to 50 °C) and contact time (30 to 1440 minutes) on sorptive removal of contaminated ions were studied. Maximum removal percentage of Fe (II), Cu (II), and As (V) by zeolite Z-RHA was found to be 91.46%, 90% and 87.81% respectively. Adsorptivity of the three adsorbate ions onto Z-RHA was found in the order of Fe (II) > As (V) > Cu (II). Heterogeneity of the adsorbent had favoured the removal of Fe (II) and Cu (II) as compared to As (V) which followed a monolayer adhesion. Morphological study of Z-RHA revealed a crystalline structure. The elemental analysis confirms the presence of silica, aluminium and oxygen which forms the basic structure of a zeolite. Also, surface chemistry revealed the presence of multiple functional groups which were

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