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UTILIZATION OF TREATED SUGARCANE BAGASSE FOR HEAVY METAL TRAPPING

W.A.K.M. Gunasekara[1, 2] and M.Y. Udugala-Ganehenege[2]*

[1]*Postgraduate Institute of Science, University of Peradeniya, Sri Lanka*
[2]*Department of Chemistry, Faculty of Science, University of Peradeniya, Sri Lanka*
*myug@pdn.ac.lk

Activated charcoal and bio char are used for the heavy metal removal from waste water. Though biochar shows a higher capacity for heavy metal removal than activated charcoal, consumption of living plants during the process has been the major criticism. The main purpose of the research reported here is to utilize biomass byproducts of industrial waste for heavy metal removal from waste water. In this regard, metal trapping and ion exchange capabilities of sugarcane bagasse were studied. Properly washed, ground and air dried sugarcane bagasse collected from *Pelawatta* sugar factory was pretreated with alkali (4% (w/w) NaOH) and acid (64% (w/w) H_2SO_4). The resulting neutralized suspension (pH ~ 7) was centrifuged and ultrasonicated. The centrifugate was evaporated and the remaining solid was characterized by FTIR, XRD techniques. Glass columns were packed with the remaining solid containing cellulose. Known aqueous solutions of Pb^{2+} (1.507 ppm), Ni^{2+} (2.365 ppm), Cu^{2+} (1.148 ppm) were passed through the columns. The effluents from columns were tested for Pb^{2+}, Ni^{2+}, Cu^{2+} by AAS. Structural changes and the improvement of the crystallinity were confirmed by the FTIR and XRD spectral data, respectively. Ability of trapping Pb^{2+}, Ni^{2+}, Cu^{2+} ions by the cellulose isolated from treated bagasse was evident by the AAS data. Significance of the current research is that the application of utilized biomass byproducts of industrial waste to remove the heavy metals present in waste water. In conclusion, the outcome of the research is extremely beneficial for the sustainable development of Sri Lanka.