**Acid modified local clay beads as effective low-cost adsorbent for dynamic adsorption of methylene blue**

**Abstract**

Locally sourced clay was harnessed to study its adsorptive potential of methylene blue (MB) in
wastewater streams. The clay was modified with sulfuric acid and aluminum hydroxide. The raw and modified freeze dried clay bead RHC and MHC were subjected to batch and batch/fixed-bed adsorption studies, respectively. Elemental analysis, morphological structures were determined, and surface area of 19.3 (RHC) and 101.2 (MHC) m2/g were obtained. Langmuir, Freundlich and Redlich–Peterson isotherms models were analyzed and the modification increased adsorption capacity from 58.02 to 223.19 mg/g at 30 8C. The MB adsorption on RHC/MHC was spontaneous, exothermic and obeyed pseudo-second-order model.