

E2 212

The sorption of Cu(II) ions on wet laterite surface

Numerous recent studies have focused on the use of natural substances in the treatment of industrial waste water, especially in developing countries, as a viable alternative to the expensive chemicals. Among many types of pollutants, removal of heavy metals has taken special attention due to their toxic nature. The adsorption phenomenon has been found economically appealing for the removal of such metals from wastewater by choosing some adsorbents under optimum operation conditions.

Laterite, an inexpensive material commonly available in Sri Lanka, shows excellent properties as an adsorbent for the removal of Cu (II) from wastewater for their safe disposal. Treatment of 10mg dm⁻³ Cu(II) solution with 10g of laterite packed in a glass column (i.d.3cm) at a flow rate of 5.0cm³min⁻¹ results in a removal of 85%. Further, about 60% of adsorbed Cu(II) can be recoverable, demonstrating the high quality of the method. More importantly, laterite-packed columns are able to decrease the Chemical Oxygen Demand (COD) by 60% and electrical conductivity by 40%. Cyclic voltammetric analysis of Cu(II) solutions before and after laterite treatment supports spectroscopic evidence of the removal process. Such methods are also helpful to understand the mechanism of removal. The proposed method would be an effective and a good alternative method for treatment of industrial effluents.