

## **Abstract:**

The binding of  $\text{Cu}^{2+}$  to dissolved organic matter in eight different natural water samples obtained from different locations in Kenya was studied by potentiometric titration method. The DOC contents of the eight natural water samples ranged from 2.71 to 374 mg/L. The water samples were adjusted to a uniform background electrolyte concentration of 0.5 M  $\text{NaNO}_3$  and pH 6 and the temperature maintained at 20 degrees C during the assay. A Nernst equation  $E \text{ (mV)} = -32.175 \text{ pCu} + 305.5$  ( $R^2 = 0.9996$ ) obtained for the  $\text{Cu}^{2+}$  calibration standards ( $10^{-4}$ - $10^{-6}$  M) was used to determine the concentration of free and bound  $\text{Cu}^{2+}$ , respectively. The bound  $[\text{Cu}^{2+}]$  varied by a factor of 2, ranging from  $2.67 \times 10^{-3}$  mol/kg DOC (in a high DOC alkaline lake water sample) to  $3.2962 \times 10^{-1}$  mol/kg (in a low DOC river water sample). The binding constants (Log K) varied by a factor of 2 and ranged from 3.43 to 5.57. The percentage binding ranged from 87% to almost 100% in the eight natural water samples. A Suwannee River Fulvic Acid standard sample (40 mg/L DOC) was used for comparison and for validation of the method.