



Synthesis of an Analytical Reagent, its Spectroscopic Characterization and Studies of its Complexation Behavior with Copper Metal Ion, its Application

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Accepted on 31st December 2016, Published online on 27th January 2017

ABSTRACT

2-Hydroxy-4-n-propoxy-5-nitro [2'-methyl] propiophenone oxime (HnPNMPO) has been used for the Spectrophotometric determination of Cu (II) at pH = 6.0. Job's method of continuous variation and Yoe and Jones Mole ratio method show metal: ligand ratio in the complex to be 1:2. The molar absorptivity of complex at 430 nm was found to be $4.450 \times 10^3 \text{ lit. mol}^{-1} \cdot \text{cm}^{-1}$ and Sandell's sensitivity was found to be $0.0143 \mu\text{g}/\text{cm}^2$. The stability constant determined spectrophotometrically is found to be 3.9×10^{11} and Gibb's free energy change for complex formation reaction is calculated to be $-15.91 \text{ k cal/mole}$. The Beer law is obeyed up to 2.54 ppm of Cu (II) ion at 430 nm. From TG studies, the energy of activation for the decomposition step has been calculated using broido method. It was found to be $21.996 \text{ k cal/mole}$. The reagent has been successfully applied for the determination of copper in drained microetch solution.

Keywords: Spectrophotometric determination, propiophenone oxime, Gibb's free energy change, Energy of activation.
