



**Liquid-liquid Extraction and spectrophotometric determination of Cu (II) with acetophenone 2', 5'-dihydroxy thiosemicarbazone derivative as an Analytical reagent**

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**ABSTRACT**

*A simple and precise spectrophotometric method is coupled with solvent extraction technique and used for the determination of Cu (II) using Acetophenone 2',5'-dihydroxy thiosemicarbazone (ADHTS) as an analytical reagent. This reagent is synthesized in the laboratory and characterized by NMR, IR and elemental analysis for its purity [1] and [2]. The reagent form a yellow coloured stable complex with copper metal, which can be quantitatively extracted into n-Butanol at pH 7.4 This Cu (II)-ADHTS complex in n-butanol exhibit intense absorption peak at 410 nm. The study of change of color intensity of Cu (II)-ADHTS complex with varying concentration of reagent showed that 1 ml of 0.1% of reagent is sufficient for full color development of 5 ppm copper solution. Beer's law is obeyed in the range of 1 to 5 ppm of copper solution giving linear and reproducible graph. The stoichiometric ratio of complex studied by Job's continuous variation method, mole ratio method and slope ratio method. The stoichiometry of Cu (II)-ADHTS complex is 1:1 the molar absorptivity and Sandell's sensitivity are also calculated. The molar absorptivity is  $0.59047 \times 10^4 \text{ L mol}^{-1} \text{ cm}^{-1}$  and Sandell's sensitivity is  $0.01070 \mu\text{g cm}^{-2}$ . The newly developed method is then applied to various commercial samples successfully and observed to be compatible with earlier known methods.*

**Keywords:** Copper, Spectrophotometric determination, n-butanol, Acetophenone, 2', 5'-dihydroxy, thio semicarbazone derivative.

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