



## **2, 4-Dihydroxy-5-Bromo Hexaphenone Oxime (DHBHPO) as a Gravimetric and Spectrophotometric Reagent: Studies on Mo (VI) Complex**

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### **ABSTRACT**

*Spectrophotometric study of Mo (VI) complex with DHBHPO at pH 2.5 in chloroform was performed at room temperature, at 420 nm. Beer's law was obeyed up to 46.05 ppm of Mo (VI). Molar absorptivity and Sandell's sensitivity were found to be  $4.69 \times 10^2 \text{ lit. mol}^{-1} \text{ cm}^{-1}$  and  $0.2046 \mu\text{g/cm}^2$  respectively. Composition of the chelate was determined using Job's method of continuous variation and Yoe and Jones mole ratio method and was found to be 1:1 (M:L). The stability constant and Gibb's free energy change for complex formation reaction were also calculated and found to be  $5.115 \times 10^5$  and  $-7.836 \text{ k.cal /mole}$  respectively. Gravimetric estimation of Mo (VI) metal ion was done with reagent DHBHPO within the pH range 1.0 to 5.0. Maximum complex formation occurs at pH 2.5. From TGA, the energy of activation was calculated using Broido method and found to be 9.01 and 39.26 k.cal /mole for 1<sup>st</sup> and 2<sup>nd</sup> step of decompositions. The reagent was characterized using analytical techniques like UV-visible, NMR and elemental analysis. Mo (VI) metal complex was characterized by UV-visible, IR spectra and TG analysis. The reagent was used successfully for the determination of Molybdenum from ferro-molybdenum alloy.*

**Keywords:** Spectrophotometric, Gravimetric, Hexaphenone oxime, DHBHPO, Gibb's free energy change, Energy of activation.

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