

Ruthenium-Benzimidazole complex: Structural, optical and solvent-free catalytic studies

B.C.Vasanth Kumar¹, K.B.Manjunatha², **Dileep Ramakrishna**³

1. Department of Chemistry (PG), Sarada Vilas College, Mysore, India

2. Department of Physics, NMAM Institute of Technology, Nitte 574110, India

3. Department of Chemistry, School of Engineering Presidency University, Bengaluru 560064, India

Abstract

Two different applications namely catalytic oxidation under solvent free conditions and optical power limiting studies were done on a mixed ligand ruthenium complex containing benzimidazole moiety and Triphenylphosphine. The complex was evaluated for its potential catalytic activity on the alcohol oxidation reaction in presence of hydrogen peroxide (30% aqueous solution) as oxidant to synthesize the corresponding carbonyls and the highlight of the process was that the reaction proceeded without the presence of any solvent. Excellent selectivity was achieved by the Ruthenium catalyst Ru (L) PPh₃Cl₂ for conversion of aromatic alcohols to aldehydes under milder conditions. One another application namely the non-linear optical activity was also studied. This activity of the complex was extracted at 532 nm wavelength, by the Z-scan method. The experimental result displays strong nonlinear absorption in the ruthenium complex and found to be 15.55 cm/W concluding that the complex displays superior optical limitation.

Keywords:

Mixed ligand, Ruthenium complex, solvent-free, alcohol oxidation, optical nonlinearity, z-scan

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