

Studies on Perchlorate Complexes of Cu(II) and Ag(I) with Substituted Benzimidazoles

N. DONAPPA AND S. B. NAIKAR*

Department of Chemistry, Central College
Bangalore University, Bangalore-560 001, India

A series of perchlorate complexes of copper(II) and silver(II) of the compositions $\text{CuL}_2(\text{ClO}_4)_2$ $\text{L}=2$ -2'-quinolyl benzimidazole (2-QylBzIH) 2,2'-bis(benzimidazolyl) sulphide (bBzIH₂s), 2,2'-bis (benzimidazolyl) ethane (bBzIH₂e) and AgLClO_4 ($\text{L}=2,6$ -bis (2-benzimidazolyl) pyridine (bBzIH₂Py), 2-QylBzIH, BbziH₂s and BbziH₂e) have been prepared and characterised by conductivity, magnetic susceptibility, electronic, IR and proton NMR spectra. IR spectra give evidence for coordination of perchlorate in most of these complexes.

INTRODUCTION

Though perchlorate generally behaves as a non-coordinating ion, there have been several examples of complexes where it binds covalently to the metal though often the binding is rather weak and is termed *semi coordination*¹⁻⁹. Recently the X-ray crystal structure determination of a tin compound where both monodentate as well as bidentate perchlorate groups are present has been reported^{10,11}, complexes of copper, cobalt, rhodium, iridium and other transition metals containing coordinating perchlorate groups are also known^{12,13}. We have reported earlier from this laboratory a series of tertiary arsine and phosphine complexes of Cu(I), Ag(I), Zn(II), Cd(II) and Hg(II) with coordinated perchlorates^{15,16}. The studies have now been undertaken to investigate the coordinating ability of perchlorate to copper(II) and silver(I) in the presence of some substituted benzimidazoles. In recent years much attention has been paid on transition metal complexes containing nitrogen heterocycles because of their interesting catalytic activity and biological importance and this has been highlighted in several review articles^{26,27}. Addison and coworkers¹⁴ have reported the characterisation of copper complex $\text{Cu}(\text{bBzIH}_2\text{Py})_2(\text{ClO}_4)_2$. Except for this study there are no reports on copper(II) and silver(I) perchlorate complexes of substituted benzimidazoles. The copper(II) and silver(I) perchlorate complexes with the following ligands are synthesised and their characterisation discussed.

EXPERIMENTAL

The metal perchlorates were prepared by dissolving a known amount of the corresponding metal oxide in a minimum quantity of 1:1 hot