

SYNTHESIS AND SPECTROSCOPIC CHARACTERIZATION OF SILVER(I) COMPLEXES OF SELENONES

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Silver(I) complexes of selenones, [LA_gNO₃] and [AgL₂]NO₃ (where L is imidazolidine-2-selenone or diazine-2-selenone and their derivatives) have been prepared and characterized by elemental analysis, IR and NMR (¹H, ¹³C and ¹⁰⁷Ag) spectroscopy. An upfield shift in the C=Se resonance of selenones in ¹³C NMR and a downfield shift in N–H resonance in ¹H NMR are consistent with selenium coordination to silver(I). In ¹⁰⁷Ag NMR, the AgNO₃ signal is deshielded by 450–650 ppm on coordination to selenones. Greater upfield shifts in ¹³C NMR were observed for [LA_gNO₃] compared to [AgL₂]NO₃ complexes, whereas the opposite trend was observed for ¹H and ¹⁰⁷Ag NMR chemical shifts.

Keywords: Silver(I) complexes; Selenones; NMR; Spectroscopy

INTRODUCTION

Recent research has shown that silver(I) is known to interact with selenium in the body resulting in a reduction of toxicity of both the metal ion and selenium [1,2]. Therefore, a systematic investigation of silver complexation with selenium-containing ligands is important from a biological point in view. In spite of this importance, there is no known report describing the complexation of silver(I) with selenone ligands. Recently, we reported the synthesis and spectroscopic characterization of silver(I) complexes of selenourea [3]. The present report describes the synthesis of silver(I) complexes of stoichiometries, [LA_gNO₃] and [AgL₂]NO₃ for a series of selenones and their characterization by ¹H, ¹³C and ¹⁰⁷Ag NMR spectroscopy. It appeared to us that the combined use of ¹³C and ¹⁰⁷Ag NMR would provide a powerful means for characterization of silver complexes in solution. The study also provides a useful database for ¹³C and ¹⁰⁷Ag NMR spectra for silver(I) complexes of selenones.

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