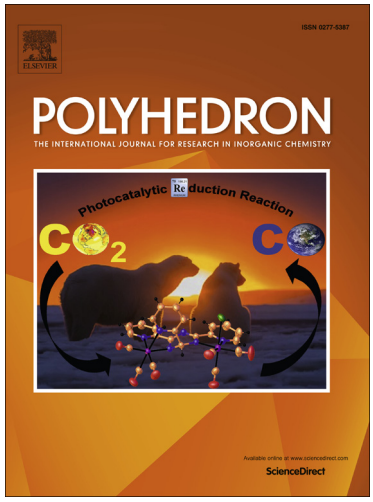

Complexes of gold(I) with a chiral diphosphine and bis(pyridine) ligands: isomeric macrocycles and a polymer

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Complexes of gold(I) with a chiral diphosphine and bis(pyridine) ligands: isomeric macrocycles and a polymer

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Dedicated to Martin Bennett on the occasion of his 80'th birthday.

Abstract

The self-assembly of $[Au_2(\mu\text{-}(\forall)binap)X_2]$, which have weakly coordinated anions X^- = trifluoroacetate, triflate or nitrate, with *bis*(amidopyridyl) ligands (NN) has given three different macrocyclic complexes of general formula $[Au_4(\mu\text{-}(\forall)binap)_2(\mu\text{-}NN)_2]X_4$, an open complex $[Au_2(\mu\text{-}(\forall)binap)(\kappa^1\text{-}NN)_2]X_2$, and a polymer $[\{Au_2(\mu\text{-}(\forall)binap)(\mu\text{-}NN)\}_n]X_{2n}$. Macrocycles with both homochiral (*RR*/*SS*) and heterochiral (*RS*/*SR*) combinations of the two binap ligands in the cations $[Au_4(\mu\text{-}binap)_2(\mu\text{-}NN)_2]^{4+}$ have been structurally characterized. The polymeric complex has the syndiotactic (heterochiral) architecture. The donor ability of the anion X^- is shown to affect both the degree of self-assembly in solution, through competition with the *bis*(amidopyridyl) ligand for coordination to gold(I), and the conformation of the *bis*(amidopyridyl) ligand in the products, through hydrogen bonding effects. In solution, there is a rapid equilibrium between cyclic and open chain oligomers, as determined by ESI-MS and NMR studies.

1. Introduction

An attractive method for the construction of complex supramolecular architectures is to use dynamic coordination chemistry or dynamic ring opening polymerization (D-ROP) to construct the primary structure and hydrogen bonding to organize these structures into supramolecular materials [1-11]. Thus, a solution containing a metal salt (MX) and a flexible