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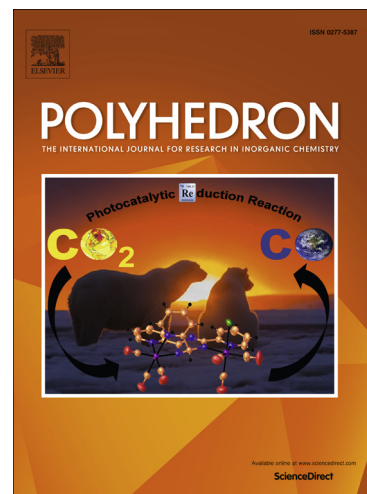
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# Complexes of gold(I) with a chiral diphosphine and bis(pyridine) ligands: isomeric macrocycles and a polymer

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

## Abstract

The self-assembly of  $[\text{Au}_2(\mu-(\nabla)\text{binap})\text{X}_2]$ , which have weakly coordinated anions  $\text{X}^- =$  trifluoroacetate, triflate or nitrate, with *bis*(amidopyridyl) ligands (NN) has given three different macrocyclic complexes of general formula  $[\text{Au}_4(\mu-(\nabla)\text{binap})_2(\mu\text{-NN})_2]\text{X}_4$ , an open complex  $[\text{Au}_2(\mu-(\nabla)\text{binap})(\kappa^1\text{-NN})_2]\text{X}_2$ , and a polymer  $[\{\text{Au}_2(\mu-(\nabla)\text{binap})(\mu\text{-NN})\}_n]\text{X}_{2n}$ . Macrocycles with both homochiral (*RR/SS*) and heterochiral (*RS/SR*) combinations of the two binap ligands in the cations  $[\text{Au}_4(\mu\text{-binap})_2(\mu\text{-NN})_2]^{4+}$  have been structurally characterized. The polymeric complex has the syndiotactic (heterochiral) architecture. The donor ability of the anion  $\text{X}^-$  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

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