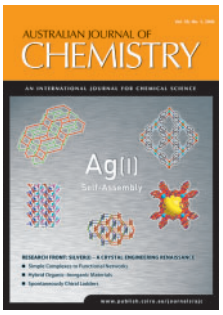

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RESEARCH FRONT: Silver(I) — a Crystal Engineering Renaissance

Essay

Silver Coordination Polymers — From Simple Complexes to Functional Networks

Edwin C. Constable

Aust. J. Chem. **2006**, *59*, 1–2.

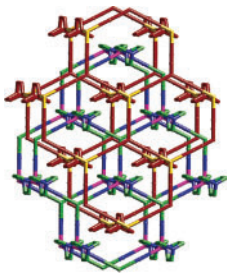
Variable coordination numbers and geometries, interesting metal–ligand combinations, silver–silver interactions, and new applications have all led to the recent renaissance in silver coordination chemistry. Papers in this issue's Research Front explore just some of this fascinating diversity.

Review

Recent Advances in Supramolecular Design and Assembly of Silver(I) Coordination Polymers

Chun-Long Chen, Bei-Sheng Kang, Cheng-Yong Su

Aust. J. Chem. **2006**, *59*, 3–18.



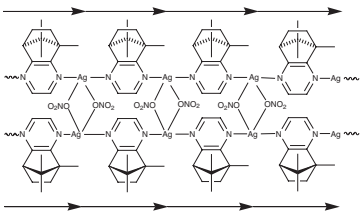
Crystal engineering aims for a predictable and controllable synthesis. In the case of silver(I) coordination polymers, the metal–ligand interactions are generally weak and labile. During supramolecular self-assembly processes, such weak bonds allow self-correction at the cost of a process influenced by subtle kinetic factors. Understanding silver(I) coordination polymers thus represents a great challenge to the crystal engineer.

Rapid Communications

Chiral Heterocyclic Ligands. XIII. Synthesis and X-Ray Crystal Structure of a Chiral, Unidirectional, Silver Coordination Polymer

Christopher M. Fitchett, Peter J. Steel

Aust. J. Chem. **2006**, *59*, 19–21.



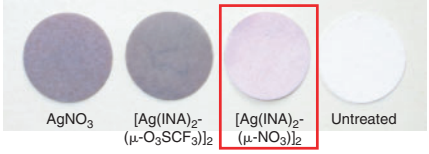
A C_1-symmetric chiral ligand is shown to react with silver nitrate to produce a new type of chiral coordination polymer with a unidirectional, ladder-like structure (shown). Crystal structure solution and refinement are presented.

$[Ag(isonicotinamide)_2NO_3]_2$ – a Stable Form of Silver Nitrate

Thomas Dorn, Katharina M. Fromm, Christoph Janiak

Aust. J. Chem. **2006**, *59*, 22–25.

The title compound combines light stability in the solid state with a ready solubility and the effective formation of free, unligated Ag^+ ions in solution. It should therefore potentially act as a stabilized formulation of solid $AgNO_3$. The graphic shows four filter papers impregnated with silver compounds and irradiated.



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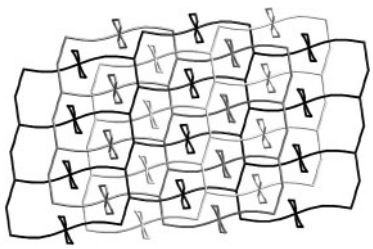
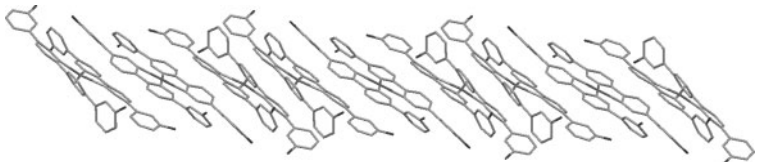


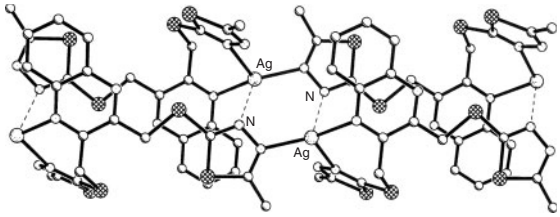
The structure of the coordination polymer $[Ni(en)_2][Ag(CN)_2]_2[Ag_2(CN)_2]$ (en = ethylenediamine) contains two-dimensional (6,3) sheets which show 3-fold 2D → 2D parallel interpenetration. The structure is reinforced by weak N–H···π(CN) and argentophilic Ag···Ag interactions.

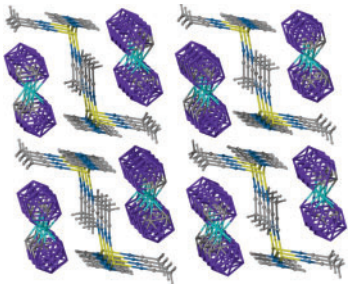
Silver(I) provides no electronic preference for a particular coordination geometry, and observed structures are dominated by steric considerations. An example is provided here which reveals a coordination geometry controlled by additional supramolecular interactions.



Full Papers

The silver(I)–nitrogen interaction is comparable in strength to hydrogen bonding. Supramolecular complexes containing this weak interaction can thus be subtly affected though steric and bonding influences of other entities — chemically similar systems can possess a wide range of structures.

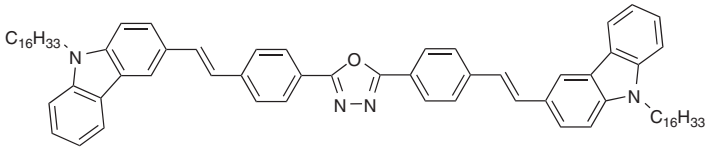




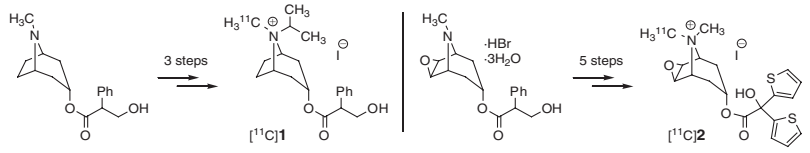
Silver(I) coordination is renowned for its steric sensitivity. Silver coordinated by carboranes, bulky carbon–boron based anions, reveal a range of infinite one, two, and three dimensional structures. One of the structures features silver four-coordinate by nitrogen atoms. Unusually, none of these systems possess the commonly observed silver–silver bonds.

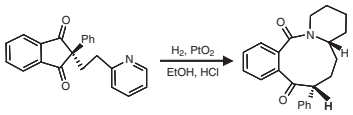
Rapid Communication

A heterocycle-based molecule containing oxadiazole and carbazole moieties has been synthesized. It is highly emissive because of symmetrical charge transfer of the donor–bridge–acceptor–bridge–donor framework. The twist conformation of 2,5-diphenyl-1,3,4-oxadiazole and the nature of the moderate electron donors enable it to exhibit two-photon induced blue emission.

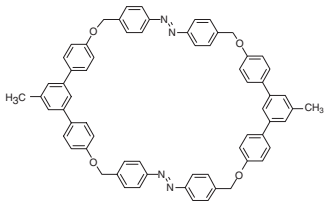


Full Papers

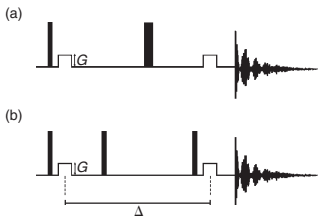




Short Communication



Focus



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