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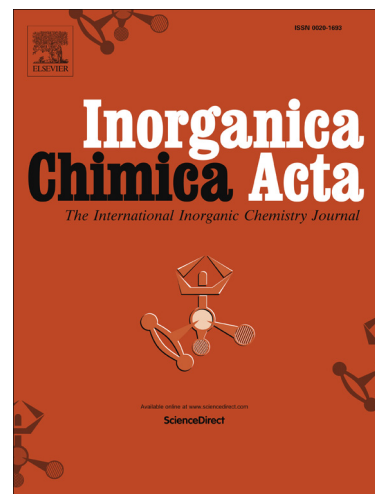
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Preparation, Crystal structure, and Properties of Novel TTF-pyridyl Thiolato Silver(I) complexes

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Abstract

Novel supramolecular silver(I) complexes with EDT-TTF-4-py, L1, (EDT-TTF-4-py = 4-ethylenedithiotetrathiafulvalenyl-pyridine) as the ligand, [Ag(L1)]₂(NO₃)₂ **1** and [Ag(L1)₂]₃(CF₃SO₃)₄•2H₂O **2** were prepared by the self-assembly method. These two complexes were characterized by elemental analysis, X-ray diffraction. In **1**, L1 acts as bis-bidentate ligand linking two silver ions through N and S atoms and forms a bimetallic macrocycle, and the bimetallic macrocycle is bridged by the weak Ag⁺⋯O interactions to form a cyclic $R_2^2(14)$ supramolecular, resulting 1-dimensional loop chain along *c* axis. And there are S⁺⋯S and C–H⁺⋯O contacts between the loop chain. While in complex **2**, two different types of Ag(L1)₂ cations are coordinated by the N_{pyridine} atom from L1 in a linear fashion and formed a trimer by weak Ag⁺⋯Ag interaction. At room temperature, the electrical conductivity of complex **2** was 20 S•cm⁻¹ and showed a semi-conductive behavior, whereas complex **1** is an insulator. Structural analyses of these two complexes suggest that the interactions between the cation and anion play a significant role in stabilizing the structures, and also indicate that the frameworks and the electrical conductivity of the silver(I) complexes with TTF-py can be adjusted by variations counter anion.

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