Supporting Information

A unique formyl iodoargentate exhibiting luminescent and photocurrent response properties

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General Remarks. All analytical grade chemicals were obtained commercially and used without further purification. IR spectra were obtained from a powdered sample pelletized with KBr on an ABB Bomen MB 102 series IR spectrophotometer in the range of 200–1200 cm\(^{-1}\). Energy-dispersive X-ray analysis (EDXA) was taken by using a JEOL JSM-6700F field-emission scanning electron microscope. Room-temperature optical diffuse reflectance spectra of the powdered samples were obtained with a Shimadzu UV-3150 spectrometer. The absorption data were calculated from reflectance spectra by using the Kubelka–Munk function: \(a/S = (1-R^2)/2R\), where \(a\) is the absorption coefficient, \(S\) is the scattering coefficient, and \(R\) is the reflectance. PXRD patterns were obtained using a Bruker D8 Advance XRD diffractometer with Cu Ka radiation (\(\lambda = 1.54056 \text{ Å}\)). The crystals of 1 were grinded and pressed uniformly on the FTO glass. The photocurrent experiment was performed on a CHI650E electrochemistry workstation in a three-electrode system, the sample coated ITO glass as the working electrode, a Pt slice as auxiliary electrode and a saturated calomel electrode (SCE) as reference electrode. The supporting electrolyte solution was 0.1 mol·dm\(^{-3}\) Na\(_2\)SO\(_4\) aqueous solution (100 mL). A 500 W Xe lamp with 420 nm was used as the illumination source. The lamp was kept on continuously, and a manual shutter was used to block exposure of the sample to the light. The sample was typically irradiated at intervals of 50 s.

Crystal Structure Determination

Single-crystal X-ray diffraction data for 1 were recorded on a Bruker APEX-II CCD diffractometer using a \(\omega\)-scan method with graphite monochromated Mo Ka radiation (\(\lambda = 0.71073 \text{ Å}\)) at 296(2) K to a maximum 2\(\theta\) value (55.64 \(^{\circ}\)). Absorption corrections were applied were applied using SADABS. The structure of 1 was solved by Direct Methods and refined by full-matrix least-squares techniques using the SHELXL-2018/3 program. Non-hydrogen atoms were refined with anisotropic displacement parameters. The H atoms bonded to C/N atoms were positioned with idealized geometry and refined with fixed isotropic displacement parameters.
Fig. S1 (a) SEM image of 1. (b-f) EDS elemental mappings of Ag, I, C, N and O for 1.

Fig. S2 EDS spectrum of 1.
Fig. S3 Simulated and experimental powder XRD patterns of 1.

Fig. S4 the coordination environments of Ag\(^{+}\) ions.

Fig. S5 The π-π stacking interactions between 1-D \([\text{H}_2\text{L}^{2+}]_n\) H-bond chains.
Fig. S6 The IR spectra of 1 and L.

Fig. S7 The excitation spectra of L and 1.
Fig. S8 Emission spectrum of L at room temperature.