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Supporting Information

Unprecedented Solution-Stable Silver(I) Ethynediyl Clusters

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Supporting information for:

Unprecedented Solution Stable Silver(I) Ethynediyl Clusters

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I. Physical measurements

X-ray experimental

II. Characterization

Figure S1. The ^{1}H NMR spectrum of complex **1** in CD_3OD.

Figure S2. The ^{1}H NMR spectrum of complex **1** in CD_3OD.

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Figure S5. The molecular structure of **2**.

I. Physical measurements

(Trimethylsilyl)acetylene, 2,2'-Bipyridine (bpy), 1,10-Phenanthroline (phen) and all the solvents employed were commercially available and used as received. The C, H and N analyses were carried out with a Vario El III microanalyzer. The FT-IR spectra were recorded from KBr pellets in the range 4000-400 cm-1 with a Nicolet AVATAR FT-IR360 spectrometer. NMR data were recorded on a Bruker Avance II spectrometer (400MHz). Emission spectra were taken with HITACHI F7000 Spectrofluorometer. Raman spectroscopy was obtained using a LabRan-I Bilor Raman system with a 632.8 nm line from He-Ne laser.

X-ray experimental

Intensity data of compound **1** • CH_3CN • $0.5CH_3OH$ and **2** • $2CH_2Cl_2$ were collected on a Oxford Gemini S Ultra system with Mo Kα at 173 K and 123K, respectively. Data reductions were performed using CrysAlis RED program. The structure of **1** were solved by direct methods using SHELXS-97 and refined by full-matrix least-squares on F^2 with anisotropic displacement parameters for the non-H atoms (except for the disordered methanol solvent molecule) using SHELXL-97. One trifluoroacetate anion is disordered over two set positions with 0.6 and 0.4 occupancy, respectively. For **2**, only silver atoms were refined by full-matrix least-squares on F^2 with anisotropic displacement parameters due to its poor crystal quality. Hydrogen atoms were calculated in ideal positions with isotropic displacement parameters set to 1.2 x Ueq of the attached atom (1.5 x Ueq for methyl hydrogen atoms). No attempts were made to include hydrogen atoms of the disordered methanol solvent molecule in **1** and the water molecules in **2**.

II. Characterization

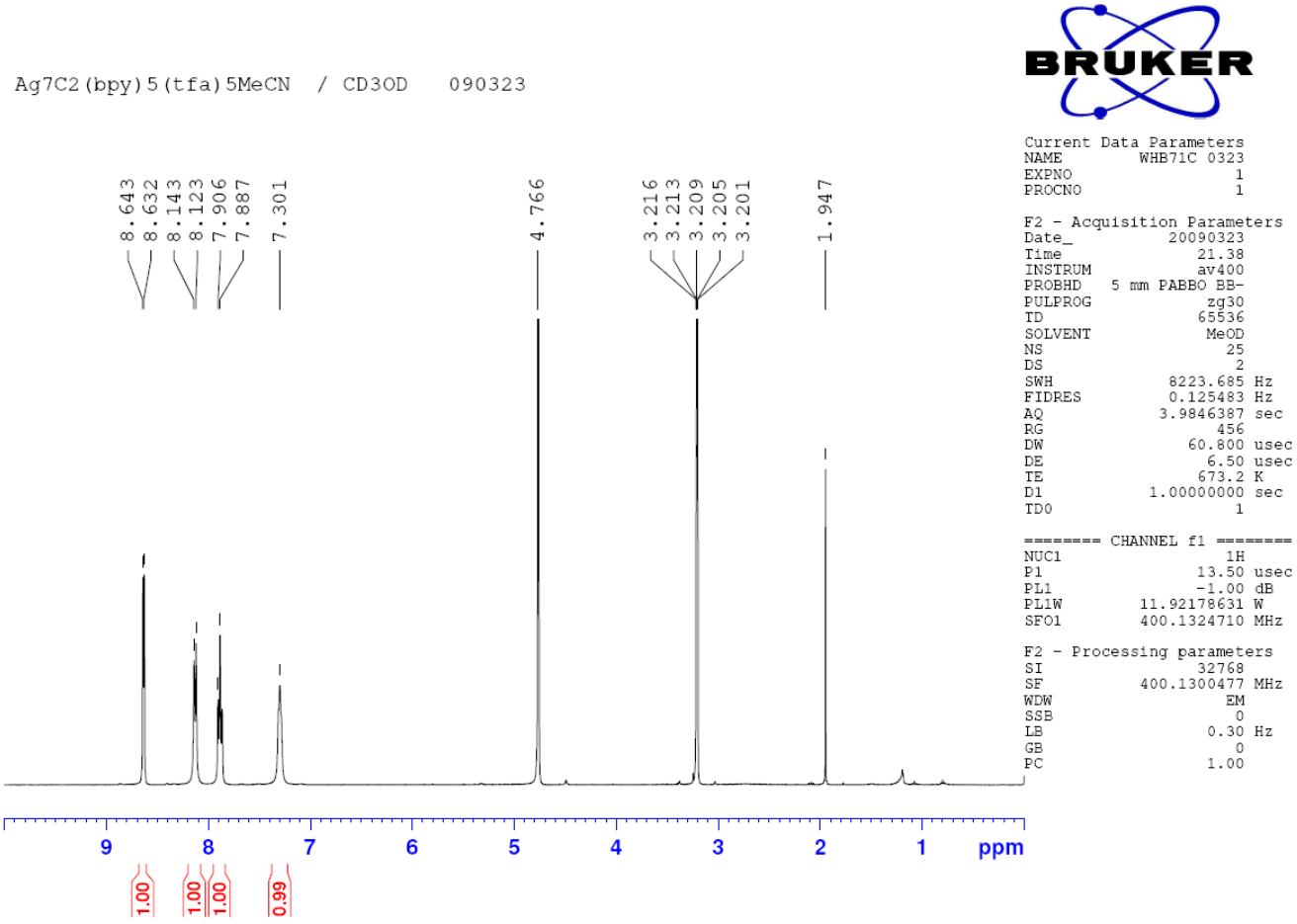

Figure S1. The ^{1}H NMR spectrum of complex **1** in CD_3OD**.**

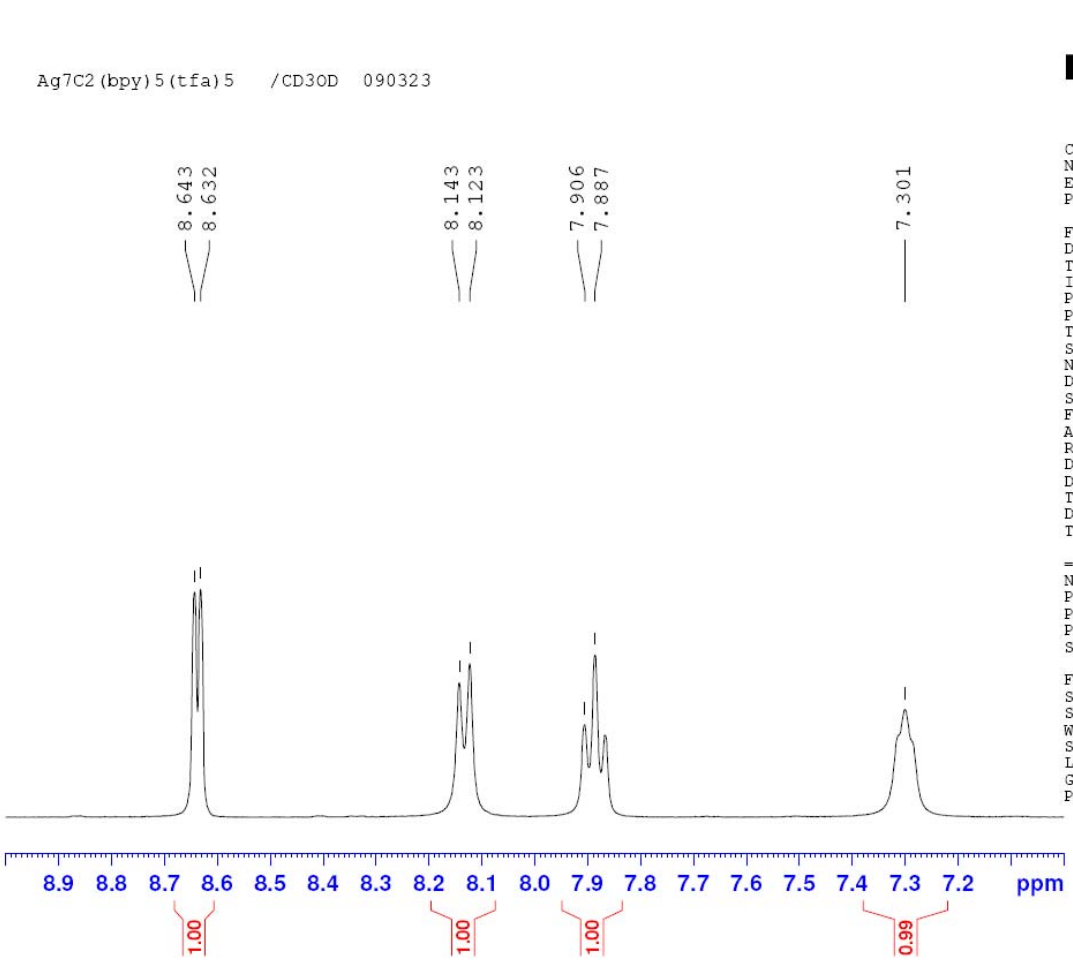

Figure S2. The ^{1}H NMR spectrum of complex **1** in CD_3OD**.**

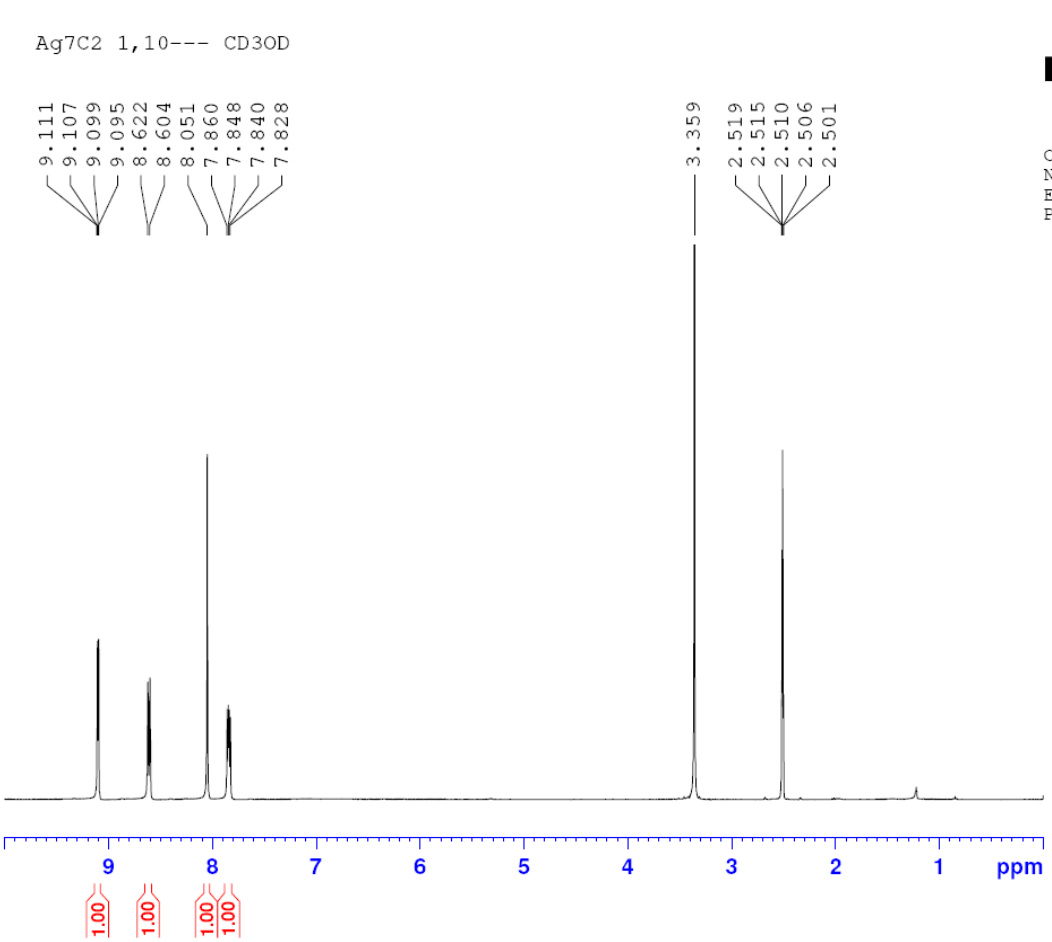

Figure S3. The ^{1}H NMR spectrum of complex **2** in CD_3OD**.**

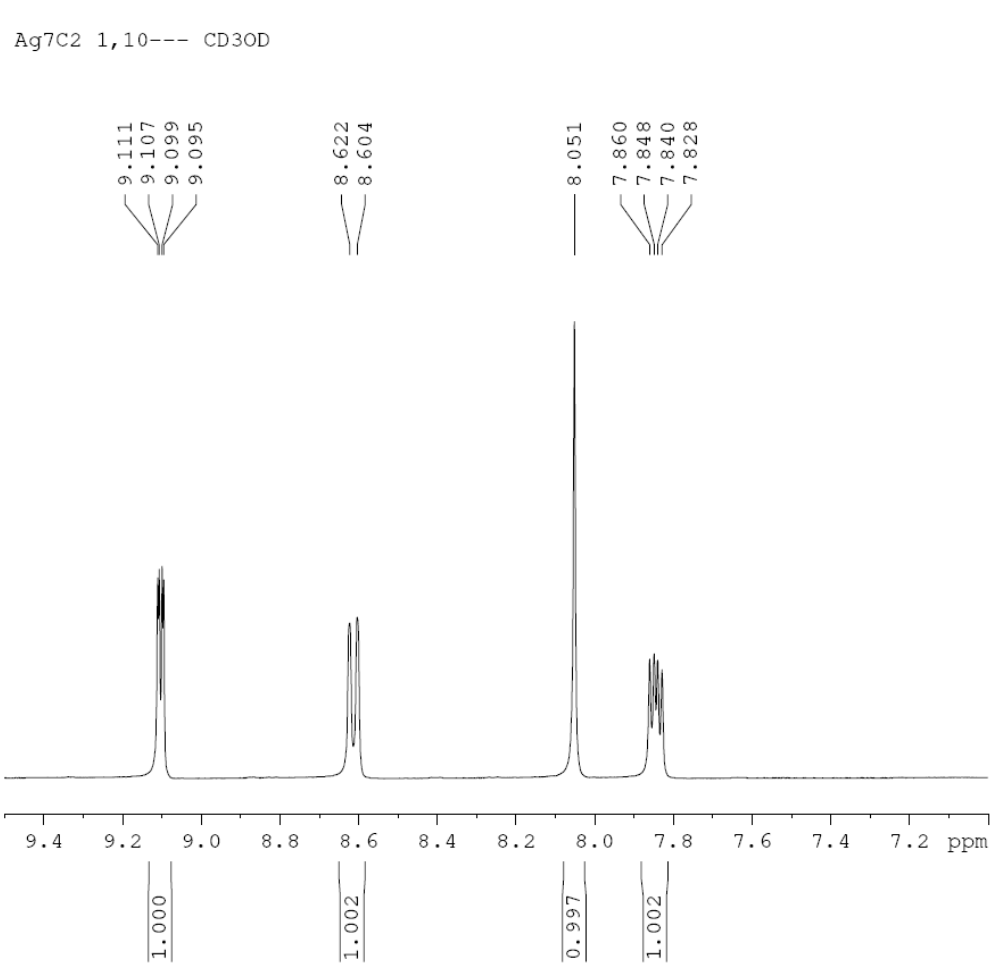

Figure S4. The ^{1}H NMR spectrum of complex **2** in CD_3OD**.**

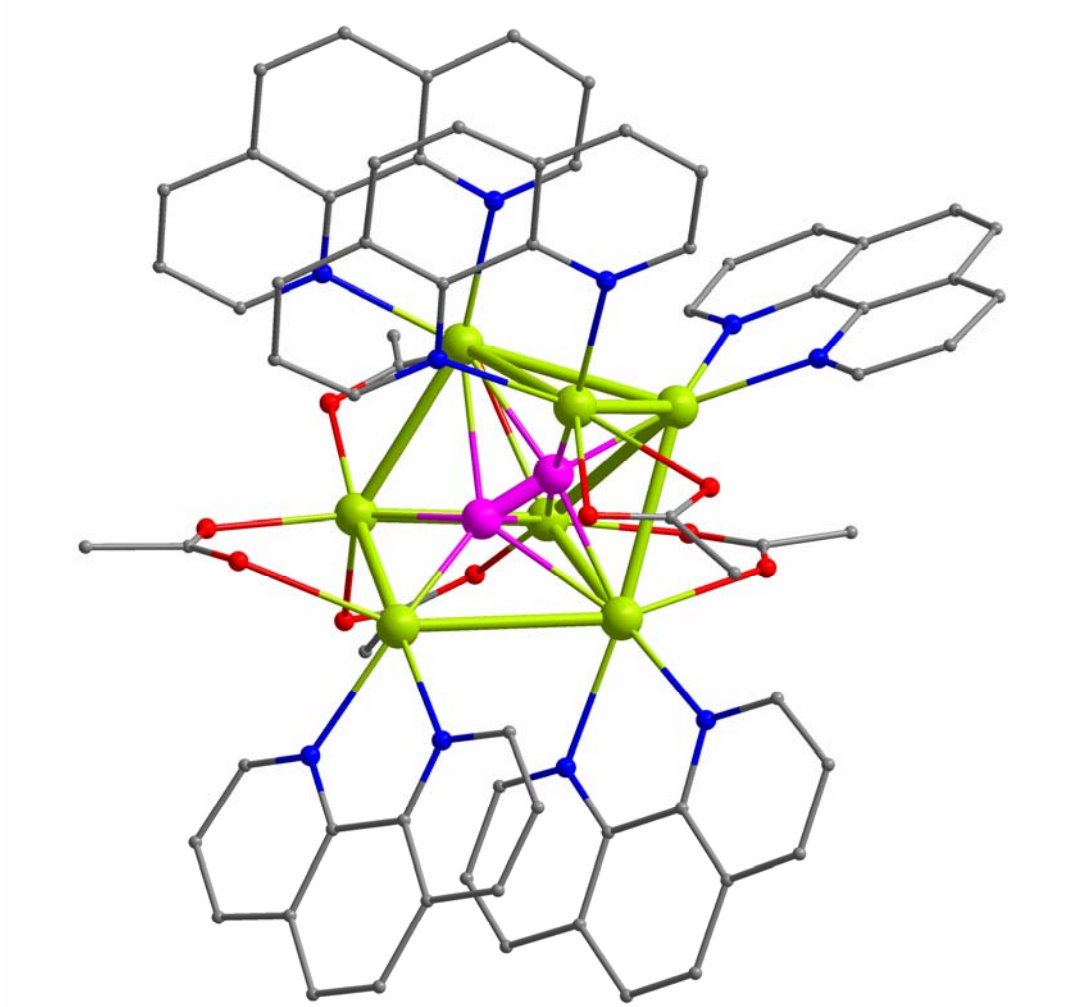

Figure S5. The molecular structure of **2.** Color legend: green, Ag; purple, C_2^{2-}; red, O; blue, N; gray, C.