Supporting Information

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A Molecular Ball Bearing Mediated by Metal-Ligand Exchange in Concert

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• Syntheses of tris-monodentate ligands 2 - 5

Tris-monodentate ligands 2 - 5 used in this study were prepared according to Scheme S1. (R)-3-amino-2-methyl-1-propanol was prepared according to the following literature: Barrow, R. A., Hemscheidt, T., Liang, J., Paik, S., Moore, R. E. & Tius, M. A. *J. Am. Chem. Soc.* **117**, 2479-2490 (1995).

Scheme S1. Preparation of tris-monodentate ligands 2 - 5

To a solution of CuI (19 mg, 0.1 mmol, 1 mol%), PdCl$_2$(PPh$_3$)$_2$ (70 mg, 0.1 mmol, 1 mol%), and 4-bromobenzyl alcohol (1.89 g, 10 mmol) in Et$_3$N (15 mL) was added trimethylsilyl acetylene (0.98 g, 10 mmol). The mixture was degassed and heated at 70 °C for 36 h under a nitrogen atmosphere. The resulting dark brown mixture was filtered and the solvent was removed in vacuo. Purification by silica gel chromatography was performed (n-hexane/AcOEt (4:1)) to obtain the desired coupling product 3 (1.89 g) in 92% yield, as a pale yellow solid. Mp. 66.0 °C; $^1$H NMR (500 MHz, CDCl$_3$) δ 7.45 (d, $J$ = 8.1 Hz, 2H), 7.28 (d, $J$ = 8.1 Hz, 2H), 4.67 (d, $J$ = 5.7 Hz, 2H), 1.89 (t, $J$ = 5.7 Hz, 1H), 0.25 (s, 9H); $^{13}$C NMR (125 MHz, CDCl$_3$) δ 141.17, 132.12, 126.61, 122.28, 104.87, 94.19, 64.87, -0.03; IR (KBr) ν 3290, 2950, 2150, 1500, 1400, 1250, 1200, 1030, 1010, 860, 840, 760 cm$^{-1}$. HRMS (ESI-TOF) $m/z$, exact mass [M + Na]$^+$ 227.0885, C$_{12}$H$_{16}$O$_2$SiNa, requires 227.0868.
7: To 6 (1.82 g, 8.9 mmol) was dissolved in THF (10 mL), and TBAF (1 M THF solution, 0.8 mL, 0.8 mmol, 9 mol%) was added. The mixture was stirred at room temperature for 30 min and then the solvent was removed under reduced pressure. The residue was purified by silica gel column chromatography (n-hexane/AcOEt (4:1 - 1:1)) to afford the deprotected alkyne (1.18 g) quantitatively, as a colorless solid, which was used immediately for the next reaction. To a solution of CuI (19 mg, 0.1 mmol, 1 mol%), PdCl2(PPh3)2 (70 mg, 0.1 mmol, 1 mol%), and 2-bromothiazole (0.9 mL, 9.0 mmol) in Et3N (10 mL) was added the deprotected alkyne (1.18 g, 8.9 mmol). The mixture was degassed and heated at 70 °C for 36 h under a nitrogen atmosphere. The resulting dark brown mixture was filtered and the solvent was removed in vacuo. Purification by silica gel chromatography was performed (n-hexane/AcOEt (1:1) to AcOEt) to obtain the desired coupling product 7 (1.47 g) in 76% yield, as a pale yellow solid. Mp. 136.0 °C; 1H NMR (500 MHz, CDCl3) δ 7.85 (d, J = 3.4 Hz, 1H), 7.55 (d, J = 8.1 Hz, 2H), 7.39 (br s, 2H), 7.38 (d, J = 3.4 Hz, 1H), 4.74 (d, J = 6.0 Hz, 2H), 2.42 (t, J = 6.0 Hz, 1H); 13C NMR (125 MHz, CDCl3) δ 148.91, 143.51, 142.66, 132.68, 126.77, 120.72, 120.38, 93.96, 82.10, 64.65; IR (KBr) ν 3350, 2900, 2200, 1510, 1470, 1440, 1410, 1260, 1090, 1010, 820, 720 cm⁻¹. HRMS (ESI-TOF) m/z exact mass [M + Na]+ 238.0277, C12H9NOSNa, requires 238.0303.

8: To 7 (1.2 g, 5.6 mmol) in dry pyridine (7 mL) was added dropwise Ac2O (0.79 mL, 8.4 mmol). After stirring for 17 h under a nitrogen atmosphere, the volatile materials were removed under reduced pressure. The residue was purified using silica gel chromatography (n-hexane/AcOEt (8:1 - 4:1)) to obtain 8 (1.4 g) quantitatively, as a yellow solid. Mp. 71.0 °C; 1H NMR (500 MHz, CDCl3) δ 7.87 (d, J = 3.3 Hz, 1H), 7.60 (d, J = 7.8 Hz, 2H), 7.40 (d, J = 3.3 Hz, 1H), 7.37 (d, J = 7.8 Hz, 2H), 5.13 (s, 2H), 2.13 (s, 3H); 13C NMR (125 MHz, CDCl3) δ 170.74, 148.67, 143.64, 137.39, 132.09, 128.09, 121.25, 120.84, 93.44, 82.57, 65.64, 20.95; IR (KBr) ν 2900, 2200, 1730, 1510, 1470, 1380, 1350, 1240, 1080, 1040, 820, 740 cm⁻¹. HRMS (ESI-TOF) m/z exact mass [M + Na]+ 280.0421, C14H11NO2SNa, requires 280.0408.

Co-catalyzed trimerization of 8: In a sealed tube flask, Co2(CO)8 (0.40 mg, 1.2 mmol, 24 mol%), 8 (1.3 g, 5 mmol), and 1,4-dioxane (5 mL) were placed. The mixture was degassed and heated at 110 °C for 15 h. The solvent was removed in vacuo. Purification by silica gel column chromatography (CHCl3/AcOEt (8:1 – 2:1)) afforded the desired 9 (125 mg, 9.7%) as a colorless solid and its isomer 10 (121 mg, 9.4%) as a red solid. 9: Mp. 244.0 °C; 1H NMR (500 MHz, CDCl3) δ 7.43 (d, J = 3.3 Hz, 3H), 7.07 (d, J = 7.8 Hz, 6H), 7.05 (d, J = 3.3 Hz, 3H), 6.98 (d, J = 7.8 Hz, 6H), 4.94 (s, 6H), 2.06 (s, 9H); 13C NMR (125 MHz, CDCl3) δ 170.65, 164.55, 144.12, 141.68, 137.72, 134.35, 133.60, 130.32, 126.41, 120.94, 65.60, 20.90; IR (KBr) ν 2930, 1740, 1380, 1360, 1220, 1080, 1020, 730 cm⁻¹; HRMS (ESI) m/z exact mass [M + Na]+ 794.1418, C42H33N3O6S3Na, requires 794.1429.

10: Mp. 189.0 °C; 1H NMR (500 MHz, CDCl3) δ 7.45 (d, J = 3.2 Hz, 1H), 7.44 (d, J = 3.2 Hz, 1H), 7.42 (d, J = 3.2 Hz, 1H), 7.10 (br, 3H), 7.05 (m, 3H), 6.98 (d, J = 8.1 Hz, 3H), 6.94 (d, J = 6.1 Hz, 6H), 4.94 (s, 2H), 4.92 (s, 2H), 4.91 (s, 2H), 2.06 (s, 3H), 2.05 (s, 6H); 13C NMR (125 MHz, CDCl3) δ 170.71, 170.68, 164.81, 164.64, 143.43, 143.35, 142.33, 141.67, 141.62, 141.57, 138.04, 137.87, 137.61, 135.95, 135.25, 134.39, 133.47, 134.01, 134.00, 130.81, 130.59, 130.43, 126.49, 126.45, 121.19, 120.94, 65.61, 20.92; IR (KBr) ν 3070, 2940, 1730, 1370, 1350, 1240, 1080, 1040, 820, 740 cm⁻¹. HRMS (ESI-TOF) m/z exact mass [M + Na]+ 794.1448, C42H33N3O6S3Na, requires 794.1429.

Deacetylation of 9: To 9 (70 mg, 0.09 mmol) in dry THF (5 mL) was added NaNMe (7.3 mg, 0.135 mmol). After stirring for 20 min, the mixture was poured into 1 M HCl aq (10 mL) and then THF was removed under reduced pressure. The residue was partitioned between AcOEt (20 mL) and water (10 mL). The aqueous layer was extracted with AcOEt (20 mL × 3), and the organic extracts were combined and dried over anhydrous MgSO4. After the solvent was removed, the crude material was purified by silica gel column chromatography (CHCl3/AcOEt (1:1) to AcOEt) to

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afford monoacetate 5 (15.2 mg) in 44% yield and diacetate 11 (4.9 mg) in 7.4% yield, as a colorless solid. 5: Mp. 329.0 °C; 1H NMR (500 MHz, CDCl3) δ 7.40 (d, J = 3.4 Hz, 2H), 7.37 (d, J = 3.2 Hz, 1H), 7.05 (d, J = 8.0 Hz, 6H), 7.02 (d, J = 3.2 Hz, 2H), 7.00 (d, J = 8.0 Hz, 4H), 6.99 (d, J = 3.4 Hz, 1H), 6.97 (d, J = 8.0 Hz, 2H), 4.93 (s, 2H), 4.51 (s, 4H), 2.05 (s, 3H), 1.67 (br s, 2H); 13C NMR (125 MHz, CDCl3) δ 144.34, 144.13, 141.66, 141.63, 139.35, 137.78, 137.14, 134.29, 133.59, 133.50, 130.36, 126.43, 125.51, 120.97, 64.75, 65.67, 20.96; IR (KBr) ν 3350, 3240, 3050, 2980, 2920, 2200, 1630, 1510, 1360, 1340, 1300, 1160, 980, 940, 820 cm⁻¹. HRMS (ESI) m/z exact mass [M + Na]^+ 710.1195, C₂₉H₂₉N₂O₂S₂Na, requires 710.1198. 11: Mp 248 °C; 1H NMR (500 MHz, CDCl3) δ 7.42 (d, J = 3.2 Hz, 1H), 7.41 (d, J = 3.3 Hz, 2H), 7.07 (d, J = 8.1 Hz, 6H), 7.04 (d, J = 3.2 Hz, 1H), 7.02 (d, J = 3.3 Hz, 2H), 7.00 (d, J = 8.1 Hz, 2H), 6.97 (d, J = 8.1 Hz, 4H), 4.93 (s, 4H), 4.52 (br s, 2H), 2.06 (s, 6H), 1.72 (br s, 1H); 13C NMR (125 MHz, CDCl3) δ 170.77, 164.71, 164.64, 144.33, 144.14, 141.70, 139.30, 137.78, 137.19, 134.32, 133.63, 133.53, 130.38, 130.33, 126.45, 125.54, 120.98, 65.67, 64.83, 20.98; IR (KBr) ν 3400, 2910, 1730, 1370, 1240, 1220, 1080, 1020, 960, 850, 830, 730 cm⁻¹; HRMS (ESI-TOF) m/z exact mass [M + Na]^+ 732.1324.

12: 3-(4-Methylphenyl)-2-propionic acid (1.6 g, 10 mmol) and N-hydroxy-succinimide (1.2 g, 10 mmol) were dissolved into dry 1,4-dioxane (10 mL) and DCC (2.1 g, 10 mmol) was added to this solution. After stirring for 2.5 h at room temperature under a nitrogen atmosphere, (S)-2-amino-1-propanol (0.71 g, 9.5 mmol) was added and then stirred for 4 h. After removal of N,N-dicyclohexyl urea by filtration, the solvent was removed under reduced pressure. The residue was partitioned between AcOEt (40 mL) and saturated NaHCO₃ aqueous solution (40 mL). The aqueous layer was extracted with AcOEt (40 mL × 3), and the organic extracts were combined and dried over anhydrous MgSO₄. After the solvent was removed, the crude material was purified by silica gel column chromatography (n-hexane/AcOEt (4:1 - 1:1)) to obtain 12 (1.50 g) in 73% yield, as a colorless solid. [α]₀²⁵ = -4.2 ° (c = 0.11). Mp. 125.5 °C. 1H NMR (500 MHz, CDCl₃) δ 7.41 (d, J = 8.1 Hz, 2H), 7.15 (d, J = 8.1 Hz, 2H), 6.16 (d, J = 6.6 Hz, 1H), 4.16 (m, 1H), 3.72 (m, 1H), 2.44 (br s, 1H), 1.24 (d, J = 6.8 Hz, 3H); 13C NMR (125 MHz, CDCl₃) δ 153.87, 140.65, 132.45, 129.30, 116.94, 85.61, 82.47, 66.38, 48.08, 21.65, 16.87; IR (KBr) ν 3400, 3240, 3050, 2980, 2920, 2200, 1630, 1560, 1300, 1220, 1050, 810 cm⁻¹. HRMS (ESI-TOF) m/z exact mass [M + Na]^+ 240.0993, C₁₀H₁₃NO₂Na, requires 240.1001.

13: Amide 12 (1.5 g, 6.9 mmol), DMAP (84 mg, 0.69 mmol), and Et₃N (1.4 mL, 10.4 mmol) were dissolved into dry CH₂Cl₂ (8 mL), and then TsCl (2.0 g, 10.4 mmol) was added. The mixture was stirred at room temperature for 11 h under a nitrogen atmosphere and then poured into water (50 mL). The organic layer was separated and the aqueous layer was extracted with CHCl₃ (30 mL × 3). The organic extracts were combined and dried over anhydrous MgSO₄. After removal of the solvent, the crude material was dissolved into MeOH (20 mL), and NaOMe (1.4 g, 25 mmol) was added. The mixture was stirred at room temperature for 1 h. After removal of the solvent under reduced pressure, the residue was partitioned between AcOEt (30 mL) and water (30 mL). The aqueous layer was extracted with AcOEt (30 mL × 3), and the organic extracts were combined and dried over anhydrous MgSO₄. After the solvent was removed, the crude material was purified by silica gel column chromatography (n-hexane/AcOEt (5:1 - 1:1)) to obtain 13 (0.98 g, 4.9 mmol) in 71% yield, as a colorless solid. [α]₀²⁵ = -60.2° (c = 0.11). Mp. 248 °C. 1H NMR (500 MHz, CDCl₃) δ 7.44 (d, J = 8.1 Hz, 2H), 7.16 (d, J = 8.1 Hz, 2H), 4.43 (dd, J = 8.6, 8.3 Hz, 1H), 4.32 (m, 1H), 3.88 (dd, J = 8.6, 8.6 Hz, 1H), 2.36 (s, 3H), 1.32 (d, J = 6.6 Hz, 3H); 13C NMR (125 MHz, CDCl₃) δ 149.61, 140.44, 132.31, 129.17, 117.20, 89.84, 76.74, 73.76, 62.09, 21.57, 21.03; IR (neat) ν 2975, 2930, 2900, 2230, 1630, 1605, 1510, 1360, 1340, 1300, 1160, 980, 940, 820 cm⁻¹. HRMS (ESI-TOF) m/z exact mass [M + H]^+ 200.1064, C₇H₁₃NOSNa, requires 200.1075.

3: In a sealed tube flask, Co₂(CO)₈ (260 mg, 0.76 mmol, 10 mol%), 13 (1.5 g, 7.5 mmol), and 1,4-dioxane (10 mL) were placed. The mixture was degassed and heated at 110 °C for 48 h. The solvent
was removed in vacuo. Purification by silica gel column chromatography (CHCl₃ - CHCl₃/MeOH (4:1)) afforded the desired 3 (176 mg, 12%), as a pale yellow solid. [α]D₂⁵ = -50.6° (c = 0.10). Mp. 253.0 °C. ¹H NMR (500 MHz, CDCl₃) δ 7.29 (d, J = 7.9 Hz, 3H), 7.08 (d, J = 7.9 Hz, 3H), 3.76 (m, 6H), 3.32 (t, J = 6.2 Hz, 3H), 2.33 (s, 9H), 0.66 (d, J = 6.4 Hz, 9H); ¹³C NMR (125 MHz, CDCl₃) δ 161.48, 142.56, 136.94, 134.61, 129.29, 127.81, 73.47, 61.67, 21.23, 20.05; IR (KBr) ν 2960, 2920, 1670, 1500, 1160, 970, 940, 820 cm⁻¹. HRMS (ESI-TOF) m/z exact mass [M + Na⁺] 620.2928, C₃₉H₃₉N₃O₃Na, requires 620.2889.

14: 3-(4-Methylphenyl)-2-propionic acid (3.9 g, 24 mmol) and N-hydroxy-succinimide (2.8 g, 24 mmol) were dissolved in dry 1,4-dioxane (24 mL) and DCC (5.0 g, 24 mmol) was added to this solution. The mixture was stirred at room temperature for 2 h. After removal of the solvent, the crude material was dissolved in MeOH (28 mL), and NaOMe (1.6 g, 30 mmol) was added and then stirred for 18 h. After removal of NaOH by filtration, the solvent was removed under reduced pressure. The residue was partitioned between AcOEt (60 mL) and saturated NaHCO₃ aqueous solution (150 mL). The aqueous layer was extracted with AcOEt (60 mL × 3), and the organic extracts were combined and dried over anhydrous MgSO₄. After the solvent was removed by purifying by silica gel column chromatography (n-hexane/AcOEt (1:2)) to obtain 14 (4.0 g) in 83% yield, as a colorless solid. [α]D₂⁵ = -13.9° (c = 0.082, CHCl₃); Mp. 58.0 °C; ¹H NMR (500 MHz, CDCl₃) δ 7.42 (d, J = 8.3 Hz, 2H), 7.15 (d, J = 8.1 Hz, 2H), 6.68 (br, 1H), 3.62 (ddd, J = 10.9, 5.9, 4.4 Hz, 1H), 3.53 (ddd, J = 14.0, 7.0, 4.3 Hz, 1H), 3.40 (ddd, J = 12.1, 6.4, 5.1 Hz, 1H), 3.29 (t, J = 6.6 Hz, 1H), 3.25 (dd, J = 13.9, 6.9 Hz, 1H), 2.36 (s, 3H), 1.90 (m, 1H), 0.93 (d, J = 7.1 Hz, 3H); ¹³C NMR (125 MHz, CDCl₃) δ 154.8, 140.7, 132.5, 129.3, 116.9, 85.8, 82.3, 64.9, 42.7, 35.8, 21.7, 14.5; IR (KBr) ν 3300, 3210, 3050, 2930, 2220, 1740, 1620, 1560, 1310, 1220, 1040, 820 cm⁻¹. HRMS (ESI-TOF) m/z exact mass [M + Na⁺] 254.1146, C₁₄H₁₅NO₂Na requires 254.1157.

15: Amide 14 (3.8 g, 16.5 mmol), DMAP (0.26 g, 2.2 mmol), and Et₃N (3.0 ml, 22 mmol) were dissolved into dry CH₂Cl₂ (28 mL), and then TsCl (4.1 g, 22 mmol) was added to this solution. The mixture was stirred at room temperature for 3 h under a nitrogen atmosphere and then poured into water (100 mL). The organic layer was separated and the aqueous layer was extracted with AcOEt (60 mL × 3). The organic extracts were combined and dried over anhydrous MgSO₄. After removal of the solvent, the crude material was dissolved in MeOH (28 mL), and NaOMe (1.6 g, 30 mmol) was added to this solution. The mixture was stirred at room temperature for 2 h. After removal of the solvent under reduced pressure, the residue was partitioned between AcOEt (60 mL) and water (100 mL). The aqueous layer was extracted with AcOEt (60 mL × 3), and the organic extracts were combined and dried over anhydrous MgSO₄. After the solvent was removed, the crude material was purified by silica gel column chromatography (n-hexane/AcOEt (4:1 - 2:1)) to obtain 15 (2.2 g, 10.2 mmol) in 62% yield, as a pale yellow solid. [α]D₂⁵ = -76.2° (c = 0.042, CHCl₃); Mp. 162.0 °C; ¹H NMR (500 MHz, CDCl₃) δ 7.43 (d, J = 8.1 Hz, 2H), 7.14 (d, J = 8.1 Hz, 2H), 4.23 (ddd, J = 10.5, 3.9, 2.7 Hz, 1H), 3.79 (t, J = 10.3 Hz, 1H), 3.60 (ddd, J = 17.0, 4.9, 2.7 Hz, 1H), 3.09 (dd, J = 17.0, 9.4 Hz, 1H), 2.36 (s, 3H), 2.09 (m, 1H), 0.98 (d, J = 6.8 Hz, 3H); ¹³C NMR (125 MHz, CDCl₃) δ 143.6, 139.9, 132.3, 129.1, 117.8, 83.4, 82.2, 70.9, 50.6, 25.9, 21.6, 14.9; IR (KBr) ν 2950, 2220, 1640, 1510, 1340, 1280, 1160, 1100, 1040, 1000, 820 cm⁻¹. HRMS (ESI-TOF) m/z exact mass [M + H⁺] 214.1238, C₁₄H₁₄NO₂Na requires 214.1232.

4: In a sealed tube flask, Co₂(CO)₈ (630 mg, 1.8 mmol, 18 mol%), 15 (2.2 g, 10.2 mmol), and 1,4-dioxane (10 mL) were placed. The mixture was degassed and heated at 100 °C for 24 h. The solvent was removed in vacuo. Purification by silica gel column chromatography (AcOEt/MeOH (2:1)) afforded the desired 4 (113 mg, 0.18 mmol) in 5.2% yield, as a pale yellow solid. [α]D₂⁵ = -111.4° (c = 0.082, CHCl₃); Mp. > 400 °C; ¹H NMR (500 MHz, CDCl₃) δ 7.29 (d, J = 7.8 Hz, 6H), 7.07 (d, J = 8.1 Hz, 6H), 3.65 (ddd, J = 10.3, 3.7, 2.4 Hz, 3H), 3.02 (ddd, J = 16.1, 4.9, 2.2 Hz, 3H), 2.96 (t, J = 9.9 Hz, 3H), 2.53 (dd, J = 16.0, 9.2 Hz, 3H), 2.34 (s, 9H), 1.40 (m, 3H), 0.58 (d, J = 6.9 Hz, 9H);
• Preparation of molecular ball bearings.

General procedure for complexation.

To a solution of AgCH₃SO₃ (1.8 mg, 8.6 μmol) and a tris-monodentate ligand (2 - 5) (5.8 μmol) in CD₂OD (0.4 mL) was added a solution of AgCH₃SO₃ (1.8 mg, 8.6 μmol) and a hexa-monodentate ligand 1 (3.3 mg, 5.8 μmol) in CD₂OD (0.4 mL), and then the mixture was kept stand at room temperature for 5 min. Its ¹H NMR spectrum showed the quantitative formation of heterotopic Ag⁺ complexes. ¹H NMR spectra for the titration studies of the formation of the Ag,1-3 complex are shown in Figure S1.

Ag₃3·(CH₃SO₃)₃·(OH)·(H₂O)²⁺, 899.0 [Ag₃3]³⁺, 766.6 [Ag,1·3-(CH₃SO₃)²⁺].

Ag₃3·(CH₃SO₃)₃·(OH)·(H₂O)²⁺, 807.1 [Ag₃3(CH₃SO₃)]³⁺.

Ag₄4·(CH₃SO₃)₄·(OH)·(H₂O)²⁺, 1779.9 [Ag₃4]²⁺, 849.2 [Ag₄2(CH₃SO₃)]²⁺.

Ag₅5·(CH₃SO₃)₅·(OH)·(H₂O)²⁺, 1893.1 [Ag₅3(CH₃SO₃)]²⁺. 5⁰ denotes the deuterated form of hydroxy groups of 5.

Ag₆6·(CH₃SO₃)₆·(OH)·(H₂O)²⁺, 529.9 [Ag₆5]³⁺, 842.4 [Ag₆4(CH₃SO₃)]²⁺, 1779.9 [Ag₆5(CH₃SO₃)]²⁺.
Figure S1. $^1$H NMR titration data (500 MHz, CD$_3$OD, 293 K, [3]$_0$ = 8.3 mM) for the formation of Ag$_3$1-3 complex (a) a mixture of 1 and 1.5 equiv of AgCH$_3$SO$_3$; (b) Ag$_3$3$_2$; (c)-(e) Ag$_3$3$_2$ + increasing amount of solution of 1 and 1.5 equiv of AgCH$_3$SO$_3$; (f) Ag$_3$1-3.

Figure S2. $^1$H NMR spectra (500 MHz, CD$_3$OD, 293 K, [4]$_0$ = 7.5 mM) of (a) a mixture of 1 and 1.5 equiv of AgCH$_3$SO$_3$; (b) Ag$_3$4$_2$; (c) Ag$_3$1-4.
• ESI-TOF mass spectra of Ag⁺ complexes (Ag₃·3, Ag₃·4, and Ag₃·5).

Figure S3. ESI-TOF mass spectrum of Ag₃·3.

Figure S4. ESI-TOF mass spectrum of Ag₃·4.

Figure S5. ESI-TOF mass spectrum of Ag₃·5.
- COSY spectra of Ag$_3$1·4 and Ag$_3$1·5 complexes.

Figure S6. COSY spectrum of Ag$_3$1·4 (aromatic region only, 500 MHz, CD$_3$OD, 203 K).
Figure S7. COSY spectrum of Ag$_3$1·5 (aromatic region only, 500 MHz, CD$_3$OD, 293 K).