Supporting Information

Phosphate Ligands in the Gold(I)-Catalysed Activation of Enynes

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Contents

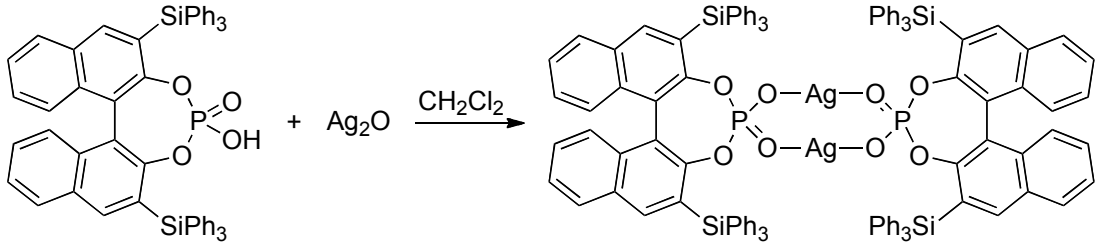
General methods.

All commercially available reagents were used as received and handled under air. Unless otherwise stated, all reactions were run under Ar under anhydrous conditions. CH_2Cl_2 was dried under N_2 using a solvent purification system (SPS). EtOH was distilled under Ar from CaH_2. All other solvents were used as received. Thin layer chromatography was carried out using TLC-aluminum sheets with 0.2 mm of silica gel (Merck GF234). Chromatography purifications were carried out using flash grade silica gel (SDS Chromatogel 60 ACC, 40-60 μm). NMR spectra were recorded at 23 ºC on a Bruker Avance 400 Ultrashield and Broker Avance 500 Ultrashield apparatus. Mass spectra were recorded on a Waters LCT Premier (ESI) and Waters GCT (EI, CI) spectrometers. Elemental analyses were performed on a LECO CHNS 932 micro-analyzer at the Universidad Complutense de Madrid. ^{1}H NMR chemical shifts are referenced to TMS. ^{13}C{^{1}H} NMR chemical shifts are referenced to the solvent signal. ^{31}P{^{1}H} NMR chemical shifts are referenced to an external standard (85% aqueous H_3PO_4).

The following compounds have been described: **10**,[1] **11**,[2] **12**,[3] **13**,[4] **14**,[4], **15**,[5] **16**,[5] **20**[6] and **21**[6].

[1] B. M. Trost, and R. Braslau, *Tetrahedron Lett*., **1988**, 29, 1231–1234.
[2] T. R. Hoye and J. A. Suriano, *Organometallics,* **1992**, 11, 2044–2050.
[3] J. W. Faller and P. P. Fontaine, *J. Org. Chem.,* **2006**, 691, 1912–1918.
[4] *(a)* C. Nieto-Oberhuber, S. Lopez and A. M. Echavarren, *J. Am. Chem. Soc.,* **2005**, 127, 6178–6179; *(b)* C. Nieto-Oberhuber, P. Pérez-Galán, E. Herrero-Gómez, T. Lauterbach, C. Rodríguez, S. López, C. Bour, A. Rosellón, D. J. Cárdenas and A. M. Echavarren, *J. Am. Chem. Soc.* **2008**, *130*, 269–279.
[5] C. Nieto-Oberhuber, M. P. Muñoz, S. López, E. Jiménez-Núñez, C. Nevado, E. Herrero-Gómez, M. Raducan, and A.M. Echavarren, *Chem. Eur. J.,* **2006**, 12, 1677–1693.
[6] M. Méndez, M. P. Muñoz, and A. M. Echavarren, *J. Am. Chem. Soc.,* **2000,** *122,* 11549-11550.

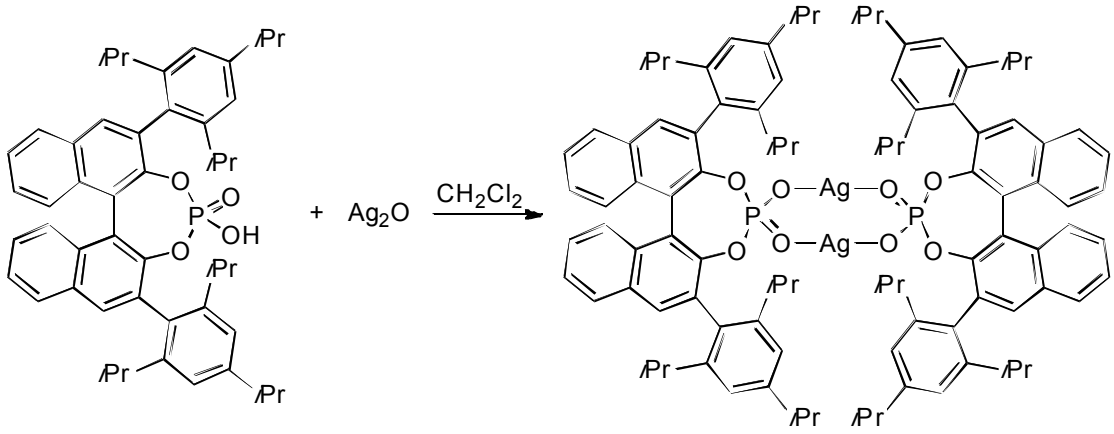
Silver(I) Complex 5



Solid Ag_2O (8.9 mg, 38 μmol) was added to a solution of the $SiPh_3$-BINOL phosphoric acid **3** (44 mg, 51 μmol) in CH_2Cl_2 (1 mL) and the mixture was stirred vigorously at room temperature for 4 h. The mixture was filtered into a vial through a small pad of Celite that was washed with CH_2Cl_2 (4x1 mL). After evaporation of the solvent, the compound was precipitated from CH_2Cl_2 (2 mL)/ MeCN (4 mL) an allowed to stand for 7 h during which time the precipitate became crystalline. Decantation and washing with MeCN (2x0.5 mL) yielded the desired compound as a off-white powder which was vacuum dried (50 ºC, overnight) (46 mg, 92%). ^{1}H NMR (400 MHz, CD_2Cl_2) δ 7.98 (s, 4H), 7.80 (d, J = 8.2 Hz, 4H), 7.60-7.58 (m, 24H), 7.44 (ddd, J = 8.1, 6.8, 1.2 Hz, 4H), 7.30 (ddd, J = 8.5, 6.7, 1.2 Hz, 4H), 7.25-7.20 (m, 16H), 7.16-7.13 (m, 24H); ^{13}C NMR (100 MHz, CD_2Cl_2) δ 152.85 (d, J = 9.3 Hz, C), 142.20 (C), 136.98 (CH), 135.25 (C), 134.72 (C), 130.99 (C), 128.98 (CH), 128.89 (CH), 127.78 (CH), 127.69 (CH), 127.50 (CH), 126.75 (d, J = 3.6 Hz, C), 125.54 (CH), 122.10 (d, J = 2.0 Hz, C); ^{31}P NMR (162 MHz, CD_2Cl_2) δ 12.7 (t, J = 17 Hz, 2P); MALDI-MS calcd. for $C_{112}H_{81}Ag_2O_8P_2Si_4$ $[M+H]^+$: 1943.3, found: 1943.4; other peaks: calcd. for $[M+Ag]^+$: 2051.2, found: 2051.4; calcd. for $[M/2+Ag]^+$: 1079.0, found: 1079.2; calcd. for $[M/2+H]^+$: 973.1, found: 973.2.

Anal. Calcd. for $C_{112}H_{82}Ag_2O_9P_2Si_4$ ($M+H_2O$): C, 68.57; H, 4.21. Found: C, 68.69; H, 4.01.

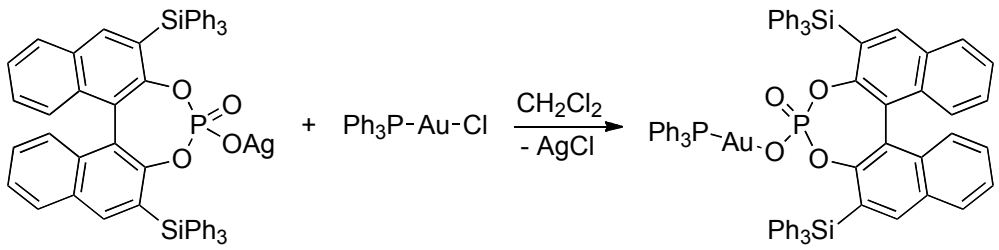
Silver(I) Complex 6



Solid Ag_2O (21 mg, 91 μmol) was added to a solution of the *i*Pr_3Ph-BINOL phosphoric acid **4** (91 mg, 0.12 mmol) in CH_2Cl_2 (2.4 mL) and the mixture was stirred vigorously at room temperature for 4 h. The mixture was filtered through a small pad of Celite, which was washed with CH_2Cl_2 (5x2 mL). After evaporation of the solvent, the compound was precipitated from MeOH (1 mL)/ H_2O (2 mL), filtered and washed with H_2O (2x4 mL). Vacuum drying (50 ºC, overnight) yielded the desired compound as a white powder (77 mg, 74%). ^{1}H NMR (400 MHz, CD_2Cl_2, 5 mg/mL) δ 7.90 (d, J = 8.2 Hz, 4H), 7.83 (s, 4H), 7.46 (ddd, J = 8.1, 6.0, 2.0 Hz, 4H), 7.30-7.25 (m, 8H), 7.05 (s, 4H), 6.97 (s, 4H), 2.82 (septuplet, J = 7.0 Hz, 4H), 2.68-2.61 (m, 8H), 1.21-1.13 (m, 60H), 0.93 (d, J = 6.8 Hz, 12H); ^{31}P NMR (162 MHz, CD_2Cl_2) δ 17.0 (t, J = 11 Hz, 2P).

The compound is soluble in CH_2Cl_2, Et_2O, hexane, MeCN, MeOH. ^{1}H and ^{31}P NMR data was in agreement with the literature[9]. Diluted solutions (5 mg/mL) in CD_2Cl_2 showed a triplet that became a multiplet/broad singlet in more concentrated solutions. The ^{31}P NMR spectrum in CD_3CN consisted of a broad singlet in the 238-338 K interval.

Au(I) Complex 7



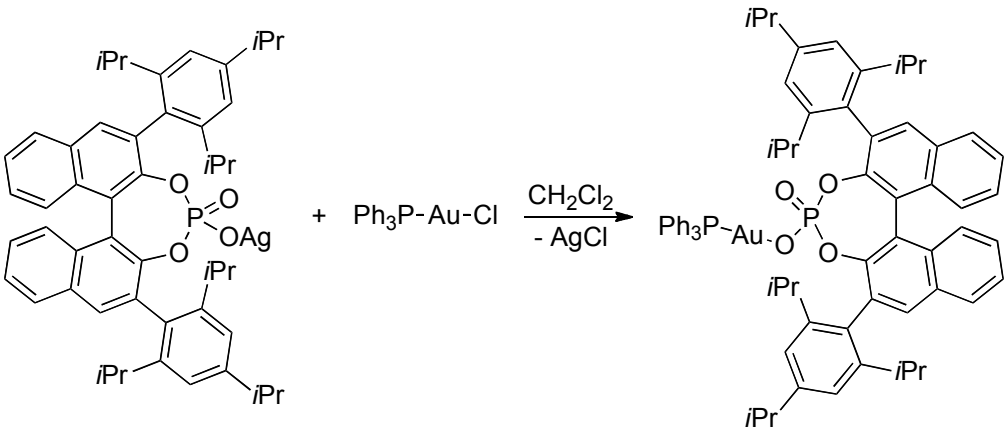
[9] G. L. Hamilton, E. J. Kang, M. Mba and F. D. Toste, *Science*, **2007**, 317, 496-499.

A mixture of [AuCl(PPh$_3$)] (24 mg, 48 μmol) and silver complex **5** (39 mg, 40 μmol monomer) was stirred in CH_2Cl_2 (1.6 mL) for 2 h. The resulting mixture was filtered through a pad of silica which was then washed with CH_2Cl_2 (3x6.5 mL) and MeCN/CH_2Cl_2 = 4 : 1 (2x6.5 mL). The MeCN containing washings were evaporated and vacuum dried to to yield a white powder (48 mg, 90%). X-ray quality crystals were grown by layering a solution of the complex in CH_2Cl_2 with MeOH or by layering a solution of $CHCl_3$ with EtOH.

$^1H\{^{31}P\}$ NMR (400 MHz, CD_2Cl_2) δ 8.08 (s, 2H), 7.72 (d, J = 8.3 Hz, 2H), 7.68-7.66 (m, 12H), 7.52 (t, J = 7.5 Hz, 3H), 7.37 (t, J = 7.7 Hz, 6H), 7.30 (ddd, J = 8.1, 5.9, 2.1 Hz, 2H), 7.24-7.20 (m, 18H), 7.14-7.10 (m, 10H); ^{13}C NMR (100 MHz, CD_2Cl_2) δ 153.54 (d, J = 9.7 Hz, C), 141.67 (CH), 137.30 (CH), 135.12 (C), 134.58 (C), 134.46 (d, J = 13.5 Hz, CH), 132.36 (d, J = 2.7 Hz, CH), 130.63 (d, J = 1.0 Hz, C), 129.65 (CH), 129.43 (d, J = 12.1 Hz, CH), 128.74 (CH), 128.43 (d, J = 66.1 Hz, C), 127.94 (CH), 127.23 (CH), 127.11 (d, J = 3.1 Hz, C), 127.01 (CH), 125.07 (CH), 122.45 (d, J = 2.2 Hz, C); ^{31}P NMR (162 MHz, CD_2Cl_2) δ 29.8 (d, J = 3.6 Hz, 1P), 8.2 (d, J = 3.6 Hz, 1P); MALDI MS *m/z*: 1782.3 (calcd for $[M + Au(PPh_3)]^+$: 1782.3), 1417.1, 1409.1, 1322.3 (calcd for $[M]^+$: 1322.3), 1260.1, 1245.2, 1066.1, 721.1, 645.1; HRMS calcd. for $C_{74}H_{55}AuO_4P_2Si_2^+$ $[M]^+$: 1322.2774, found: 1322.2784.

Anal. calcd. for: $C_{148}H_{116}Au_2O_{11}P_4Si_4$ (2M + 3H_2O): C, 65.82; H, 4.33. Found: C, 65.78; H, 4.30.

Au(I) Complex 8



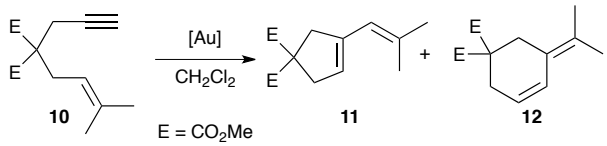
A mixture of [AuCl(PPh$_3$)] (21 mg, 42 μmol) and silver complex **6** (30 mg, 35 μmol monomer) was stirred in CH_2Cl_2 (1.4 mL) for 2 h. The resulting mixture was applied over a pad of silica and separated by flash chromatography (CH_2Cl_2 to MeCN). After

vacuum drying (65 ºC, 4 h), the desired complex was obtained as a white powder (42 mg, 98%).

$^{1}H\{^{31}P\}$ NMR (400 MHz, CD_2Cl_2) δ 7.84 (d, J = 8.2 Hz, 2H), 7.79 (s, 2H), 7.52-7.47 (m, 3H), 7.39-7.35 (m, 8H), 7.24-7.12 (m, 12H), 7.03 (d, J = 1.6 Hz, 2H), 2.96 (br m, 2H), 2.88 (septuplet, J = 7.0 Hz, 2H), 2.67 (septuplet, J = 6.8 Hz, 2H), 1.27-1.24 (m, 18H), 1.17 (d, J = 6.8 Hz, 6H), 1.01 (d, J = 6.8 Hz, 6H), 0.88 (d, J = 6.8 Hz, 6H); ^{13}C NMR (100 MHz, CD_2Cl_2) δ 148.61 (C), 148.24 (br s, C), 148.04 (d, J = 9.2 Hz, C), 147.65 (br s, C), 134.35 (d, J = 13.6 Hz, CH), 133.13 (br s, C), 132.85 (C), 132.50 (CH), 132.35 (d, J = 2.7 Hz, CH), 130.98 (C), 129.49 (d, J = 12.1 Hz, CH), 128.43 (CH), 128.36 (d, J = 66.6 Hz, C), 127.42 (CH), 126.18 (CH), 125.34 (CH), 122.78 (d, J = 2.0 Hz, C), 121.66 (CH), 120.61 (CH), 34.61 (CH), 31.68 (br s, CH), 31.29 (CH), 26.61 (CH_3), 24.97 (CH_3), 24.28 (CH_3), 24.13 (CH_3), 24.04 (br s, CH_3), 23.58 (br s, CH_3); ^{31}P NMR (202 MHz, CD_2Cl_2, -40 ºC) δ 29.8 (d, J = 2.6 Hz, 1P), 10.1 (d, J = 2.6 Hz, 1P); HRMS calcd for $C_{68}H_{71}AuO_4P_2^+$ $[M]^+$: 1210.4488, found: 1210.4419; MALDI MS *m/z*: 1669.5 (calcd for $[M + Au(PPh_3)]^+$: 1669.5), 1417.2, 1409.1, 1227.2, 1210.4 (calcd for $[M]^+$: 1210.4), 1168.3, 1067.1, 1034.2, 721.1, 710.2.

Anal. calcd. for: $C_{68}H_{71}AuO_4P_2$: C, 67.43; H, 5.91. Found: C, 67.56; H, 5.99.

Reaction of 1,6-enyne 10 with gold catalyst 7



1,6-Enyne **10** (24 mg, 0.10 mmol) was added to a solution of **7** (6.6 mg, 5 µmol) and $[Ag(NCMe)_2](SbF_6)$ (2.1 mg, 5 µmol) in CD_2Cl_2 (0.5 mL). The progress of the reaction was monitored by ^{1}H NMR. Conversion after 20 min: 100%, ratio **11**:**12** = 89 : 11.

Control reaction performed in the absence of the gold complex.

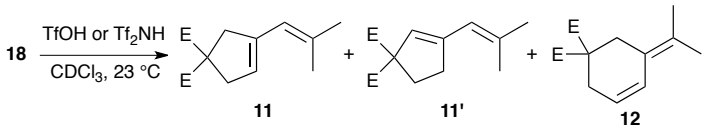
1,6-Enyne **10** (24 mg, 0.10 mmol) was dissolved in CD_2Cl_2 (0.5 mL) and $[Ag(NCMe)_2](SbF_6)$ (2.1 mg, 5 µmol) was added. The progress of the reaction was monitored by ^{1}H NMR. Conversion after 20 min: 9%, ratio **11**:**12** = 45 : 55. Isolated yield = 6%.

A trace of hydroxycyclization (**20**) product[6] (3%) was also observed in both experiments.

Control reaction performed with gold complex **[Au(PPh$_3$)(MeCN)](SbF$_6$)**

[Au(PPh$_3$)(MeCN)](SbF$_6$) (2.8 mg, 5.25 μmol) was dissolved in $CDCl_3$ (0.5 mL). Then, enyne **10** (25 mg, 0.105 mmol) was added. ^{1}H NMR (5.5 h reaction time) showed a 1 : 2 : 1 mixture of **11** / **11'** / **12**. When (1 mol%) of [Au(PPh$_3$)(MeCN]SbF$_6$ was used, **11**, **11'**, and **12** (2:1:1 ratio) were obtained quantitatively in only 30 min. Identical results were obtained with [Au(NTf$_2$)(PPh$_3$)] (1 mol%).

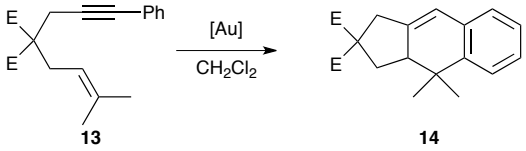
Reaction of alkynyl gold(I) complex 18 with acids.



Complex **18** (10 mg, 14.4 μmol) was dissolved in $CDCl_3$ (0.4 mL). Then, TfOH was added (1.3 μL, 14.4 μmol). ^{1}H NMR (30 min reaction time) showed a 4 : 4 : 1 mixture of **11** / **11'** / **12** (86%).

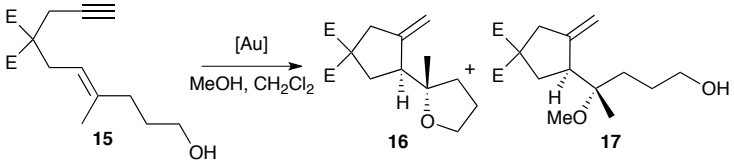
Complex **18** (10 mg, 14.4 μmol) was dissolved in $CDCl_3$ (0.4 mL). Then, Tf_2NH was added (4.0 mg, 14.4 μmol). ^{1}H NMR (90 min reaction time) showed a 3 : 3 : 1 mixture of **11** / **11'** / **12** (80%).

Reaction of 1,6-enyne 13 with gold catalyst 5.



Reaction of **13** with gold(I) complex **7** (5 mol%) and [Ag(NCMe)$_2$]SbF$_6$[10] (5 mol%) in CH_2Cl_2 at room temperature for 6 h gave tricyclic compound **14**[4] (81%, < 1% ee).

(*R)-Dimethyl 3-methylene-4-((*R**)-2-methyltetrahydrofuran-2-yl)cyclopentane-1,1-dicarboxylate (16) and (*R**)-Dimethyl-3-((*R**)-5-hydroxy-2-methoxypentan-2-yl)-4-methylenecyclopentane-1,1-dicarboxylate (17).**

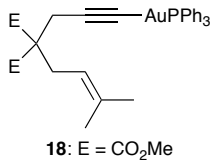


[10] M. Raducan, C. Rodríguez-Escrich, X. C. Cambeiro, E. Escudero-Adán, M. A. Pericàs and A. M. Echavarren, *Chem. Commun.*, **2011**, *47*, 4893–4895.

A solution of enynol **15** (25 mg, 0.089 mmol) in CH_2Cl_2 (0.15 mL) was added to a solution of gold(I) complex **7** (5.9 mg, 4.43 μmol) in CH_2Cl_2 (0.15 mL). Then, MeOH (0.20 mL) was added and the mixture was stirred at room temperature for 24 h. The resulting mixture was filtered over a small pad of silica, the solvent was evaporated and the residue was chromatographed (hexane/EtOAc) to give known compound **16**[5] (4.8 mg, 19%) and **17** (12.4 mg, 44%).

17: ^{1}H NMR (400 MHz, $CDCl_3$) δ 5.05 (s, 1H), 4.93 (s, 1H), 3.73 (s, 3H), 3.72 (s, 3H), 3.68-3.59 (m, 2H), 3.19 (s, 2H), 2.98 – 2.84 (m, 2H), 2.61 – 2.47 (m, 1H), 2.24 – 1.86 (m, 2H), 1.27 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 171.98 (C), 171.86 (C), 147.91 (C), 110.76 (CH_2), 78.48(C), 63.30 (CH_2), 58.54 (C), 52.74 (C), 48.87 (CH_3), 47.24 (CH_3), 43.68 (CH_2), 35.65 (CH_2), 31.29 (CH_3), 29.70 (CH_2), 26.65 (CH_2), 19.72 (CH_2), 17.54 (CH_3). HRMS-EI *m/z* calcd. for $C_{16}H_{26}O_6Na$: 337.1627; found 337. 1618 $[M+Na]^+$.

(4,4-Bis(methoxycarbonyl)-7-methyl-6-octen-1-ynyl)(triphenylphosphine)gold (18).



18: E = CO_2Me

To a suspension of [AuCl(PPh_3)] (100 mg, 0.202 mmol) in dry ethanol (4 mL) was added NaOEt [freshly prepared from Na (5 mg, 0.212 mmol) in ethanol (0.5 mL)] and enyne **10** (48 mg, 0.202 mmol). The solution was stirred at room temperature for 4.5 h. The solvent was partially evaporated, after which the white precipitate was filtered to give **18** (54 mg, 38% yield). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.54 – 7.46 (m, 9H), 7.45 – 7.40 (m, 6H), 5.06-5.01 (m, 1H), 3.72 (s, 6H), 2.99 (d, J = 1.9 Hz, 2H), 2.91-2.87 (m, 2H), 1.67 (s, 3H), 1.68 (m, 3H). ^{13}C NMR (126 MHz, $CDCl_3$) δ 171.23 (C), 135.93 (C), 134.36 (CH), 134.25 (CH), 131.43 (CH), 131.41 (CH), 130.21 (C), 129.77 (C), 129.10 (CH), 129.01 (CH), 117.84 (CH), 98.25 (C), 98.03 (C), 57.86 (C), 52.51 (CH3), 30.88 (CH_2), 26.06 (CH_3), 24.17 (CH_2), 18.02 (CH_3). ^{31}P NMR (202 MHz, $CDCl_3$) δ 42.12. HRMS-EI *m/z* calcd. for $C_{31}H_{33}O_4PAu$: 697.1782; found 697.1774 $[M+H]^+$.

Hydration of 1-octyne

The gold phosphate complex **7** or **8** (5 μmol) was dissolved in CD_3OD (0.5 mL) then 1-octyne (75 μL, 0.50 mmol) and D_2O (36 μL, 2.0 mmol) were added. The reaction was

followed by ^{1}H and ^{31}P NMR. After 14 h deuteration of the alkyne proton was observed. In the case of complex **7** additional CD_2Cl_2 (0.25 mL) was added in order to dissolve the gold complex. Conversions were determined by ^{1}H NMR at 14 h, 42 h and 67 h.

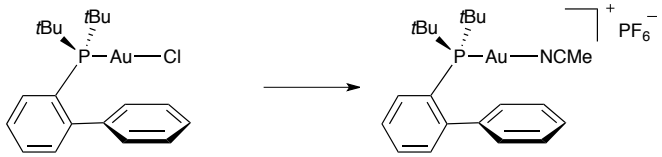
Synthesis of gold complex [Au(OPOF$_2$)(PPh$_3$)] 19.

19

PPh_3AuCl (0.100 g, 0.202 mmol) was dissolved in CH_2Cl_2 (10 mL). Then, solid $AgPF_6$ (51.1 mg, 0.202 mmol) was added. The mixture was stirred at room temperature for 2.5 hours The solution was filtered through a Celite pad and washed with CH_2Cl_2. The filtrate was concentrated to give **19** as a white solid (0.112 g, 99%). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.58 – 7.44 (m, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 134.16, 134.03, 132.46, 132.43, 129.51, 129.38, 127.82, 127.15. ^{31}P NMR (162 MHz, $CDCl_3$) δ 45.17 (s), 27.53 (s), -13.23 (t, J = 974.4 Hz). Anal. Calcd. for $C_{18}H_{15}AuF_2O_2P_2$: C, 38.59; H: 2.70. Found: C, 38.67; H, 2.88.

In Chung's original report the difluorophosphate signal appeared at δ -20.1 (t, $J(^{31}P\text{-}^{19}F)$ = 972 Hz).[11]

Synthesis of gold complex 9b.



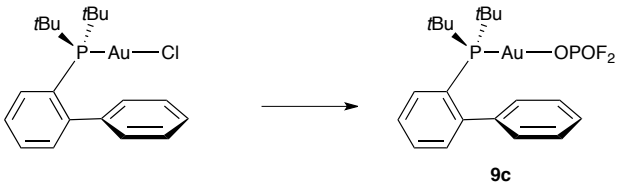
9b

Chloro[(1,1′-biphenyl-2-yl)di-*tert*-butylphosphine]gold(I) (50 mg, 0.094 mmol) was dissolved in wet MeCN (0.75 mL). Then, solid $AgPF_6$ (23.8 mg, 0.094 mmol) was added. The mixture was stirred at room temperature for 24 hours. The solution was filtered through a Celite pad and washed with MeCN. The filtrate was concentrated to give **9b** as a dark white solid (56 mg, 87%). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.89 – 7.82 (m, 1H), 7.60 – 7.51 (m, 5H), 7.32 (ddd, J = 4.5, 3.6, 1.9 Hz, 1H), 7.16 (dd, J = 7.8, 1.5 Hz, 2H), 2.33 (s, 3H), 1.43 (s, 9H), 1.39 (s, 9H). ^{3}C NMR (101 MHz, $CDCl_3$) δ 133.30, 133.22, 132.86, 131.28, 129.31, 128.97, 128.32, 128.24, 127.31, 127.24, 127.18, 38.14,

[11] S. M. Kim, J. H. Park and Y K. Chung, *Chem. Commun.*, **2011**, *47*, 6717-6719.

37.86, 30.84, 30.78. ^{31}P NMR (162 MHz, $CDCl_3$) δ 57.23 (s), -144.23 (sept., J = 711.9 Hz).

Synthesis of gold complex 9c.



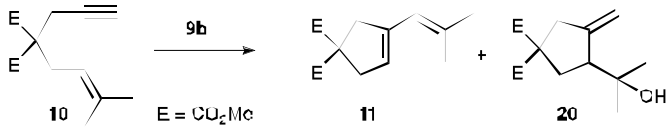
9c

Chloro[(1,1′-biphenyl-2-yl)di-tert-butylphosphine]gold(I) (50 mg, 0.094 mmol) was dissolved in wet CH_2Cl_2 (4.7 mL). Then, solid $AgPF_6$ was added. The mixture was stirred at room temperature for 24 hours. The solution was filtered through a Celite pad and washed with CH_2Cl_2. The filtrate was concentrated to give **9c** as a white solid (53.5 mg, 90%). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.89 – 7.83 (m, 1H), 7.58 – 7.43 (m, 5H), 7.36 – 7.31 (m, 1H), 7.15 (d, J = 7.2 Hz, 2H), 1.42 (s, 9H), 1.38 (s, 8H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 133.19, 133.12, 132.81, 131.01, 129.17, 129.09, 128.93, 128.68, 128.63, 128.55, 38.06, 37.77, 30.85, 30.79. ^{31}P NMR (202 MHz, $CDCl_3$) δ 56.62 (s), -13.49 (t, J = 971.5 Hz).

Reaction of 1,6-enyne 10 with 19.

Complex **19** (3 mg, 5.25 μmol) was dissolved in $CDCl_3$ (0.5 mL). Then, enyne **10** (25 mg, 0.105 mmol) was added. Conversion after 20 min: 7%.

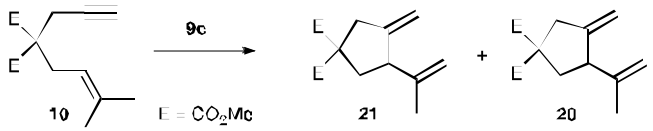
Reaction of 1,6-enyne 10 with 9b.



10 **11** **20**

Gold complex **9b** (3.6 mg, 5.25 μmmol) was dissolved in $CDCl_3$ (0.5 mL). Then, enyne **10** (25 mg, 0.105 mmol) was added. ^{1}H NMR (35 min reaction time) showed a 7 : 1 mixture of **11** / **20**. A trace of compound **12** (3%) was also observed.

Reaction of 1,6-enyne 10 with 9c.



10 **21** **20**

Gold complex **9c** (3.1 mg, 5.25 µmmol) was dissolved in $CDCl_3$ (0.5 mL). Then, enyne **10** (25 mg, 0.105 mmol) was added. ^{1}H NMR (17 hours reaction time) showed a 1 : 1 mixture of **21** / **20**. A trace of compound **11** (5%) was also observed.

Reaction of 1,6-enyne 10 with acids.

Enyne **10** (0.105 mmol, 25 mg) was dissolved in $CDCl_3$ (0.5 mL). Then, TfOH (1.05 µmol, 9,3. 10^{-2} µmL) was added. ^{1}H NMR (24 hours reaction time) showed no reaction.
Enyne **10** (0.105 mmol, 25 mg) was dissolved in $CDCl_3$ (0.5 mL). Then, Tf_2NH (1.05 µmol, 3,0.10^{-2} µmL) was added. ^{1}H NMR (24 hours reaction time) showed no reaction.
Enyne **10** (0.105 mmol, 25 mg) was dissolved in $CDCl_3$ (0.5 mL). Then, HBF_4 (1.05 µmol, 6,6.10^{-2} µmL) was added. ^{1}H NMR (24 hours reaction time) showed no reaction.

Reaction of 1,6-enyne 13 with acids.

Enyne **13** (0.080 mmol, 25 mg) was dissolved in $CDCl_3$ (0.38 mL). Then, TfOH (1.05 µmol, 3,5. 10^{-1} µmL) was added. ^{1}H NMR (24 hours reaction time) showed no reaction.
Enyne **13** (0.080 mmol, 25 mg) was dissolved in $CDCl_3$ (0.38 mL). Then, Tf_2NH (1.05 µmol, 1,1.10^{-1} µmL) was added. ^{1}H NMR (24 hours reaction time) showed no reaction.
Enyne **13** (0.080 mmol, 25 mg) was dissolved in $CDCl_3$ (0.38 mL). Then, HBF_4 (1.05 µmol, 2,5.10^{-1} µmL) was added. ^{1}H NMR (24 hours reaction time) showed no reaction.

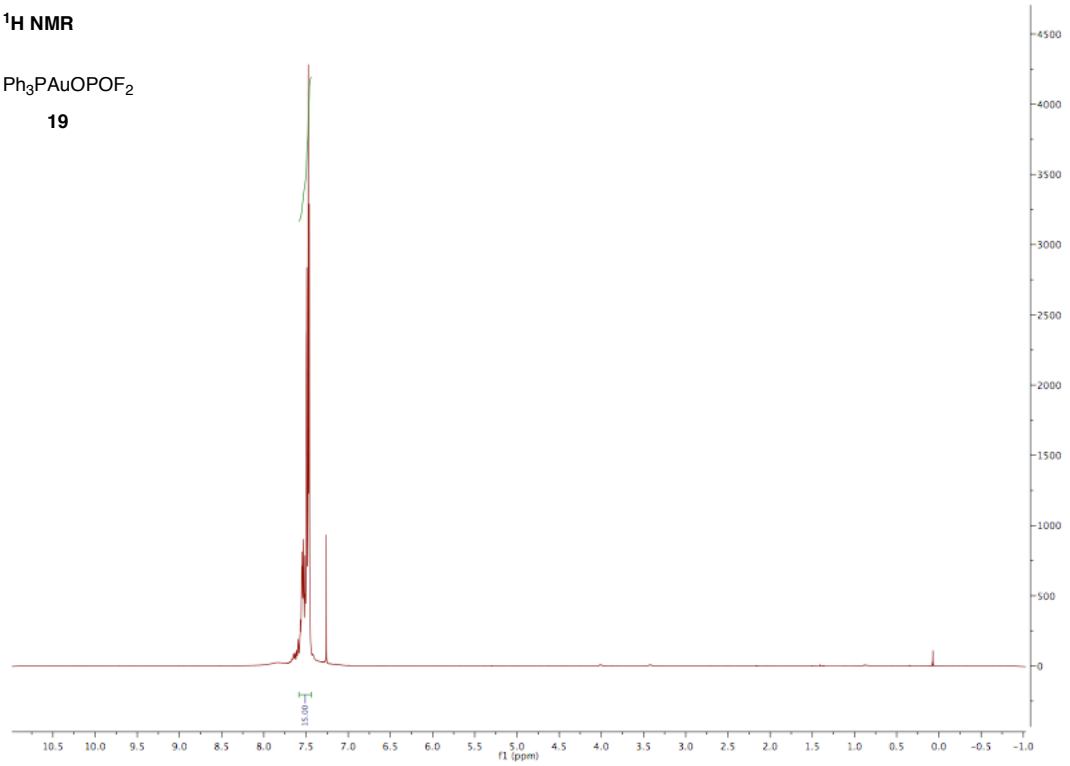
Reaction of 1,6-enyne 10 with [Au(NTf_2) (PPh_3)]

Complex PPh_3AuNTf_2 (0.8 mg, 1.05 µmol) was dissolved in $CDCl_3$ (0.5 mL) and 2,6-di-*tert*-butylpyridine was added (0.24 µL, 1.05 µmol). Then enyne 10 (25 mg, 0.105 mmol) was added. ^{1}H NMR (2 hours reaction time) showed a 4 : 1 : 2 mixture of **11** / **12** / **20**.

^{1}H NMR

$Ph_3PAuOPOF_2$

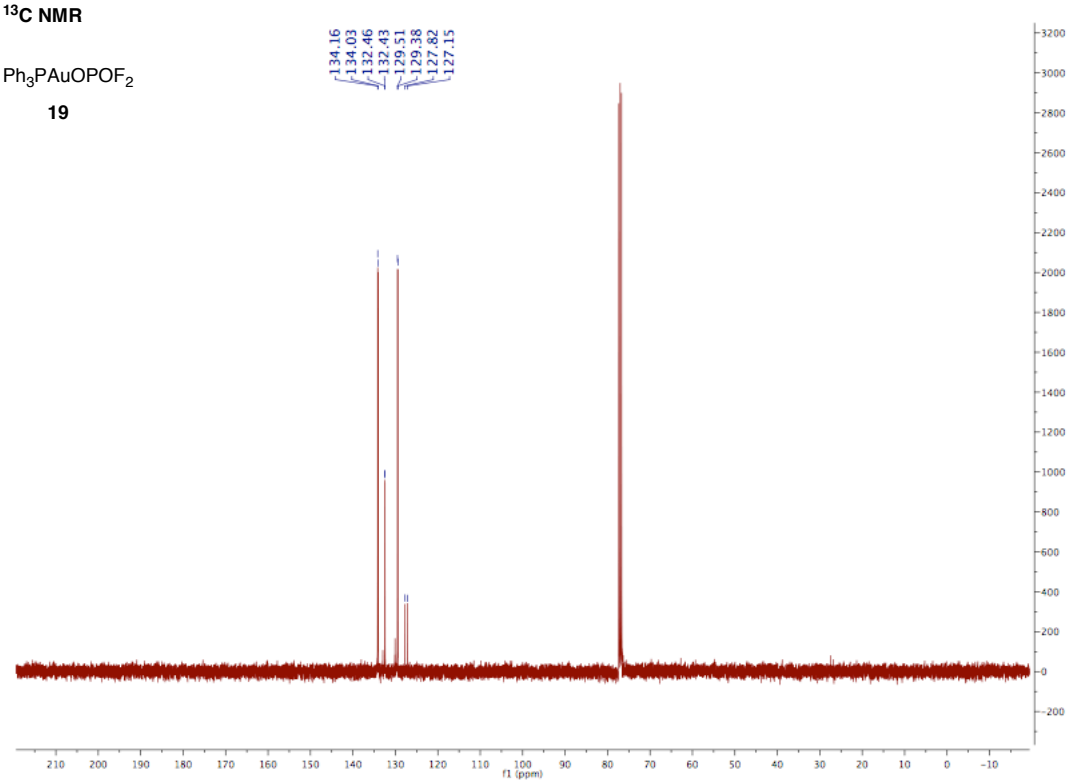
19



^{13}C NMR

$Ph_3PAuOPOF_2$

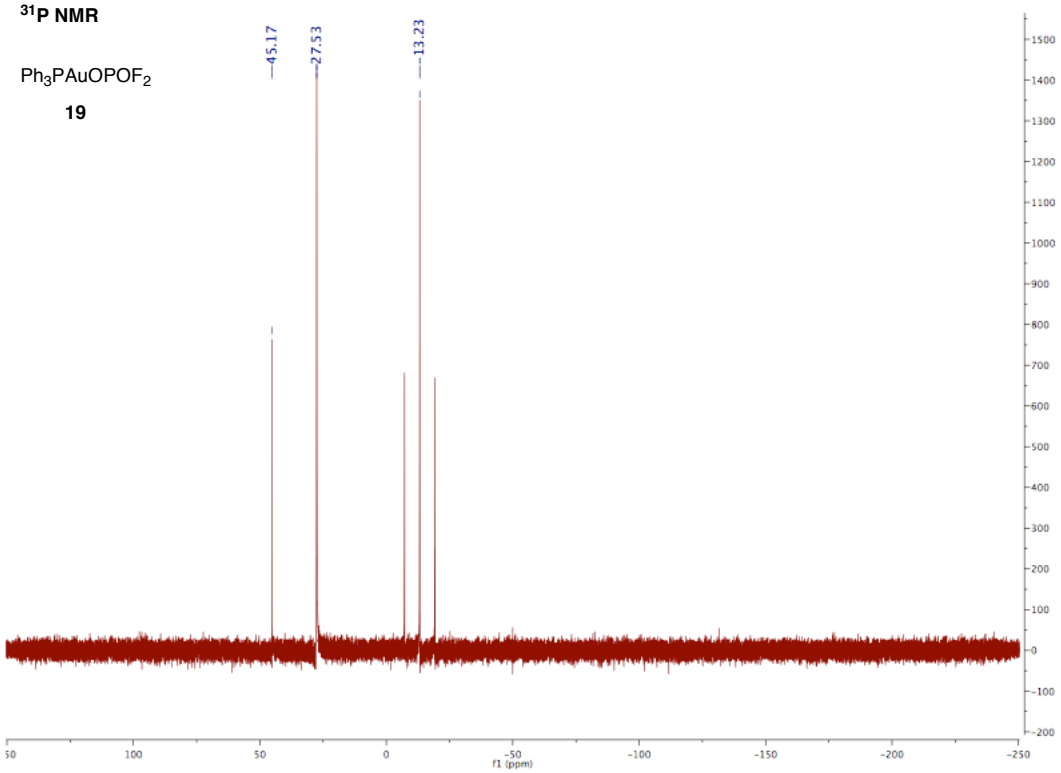
19



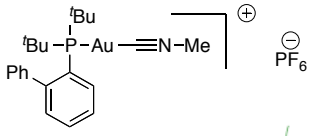
^{31}P NMR

$Ph_3PAuOPOF_2$

19

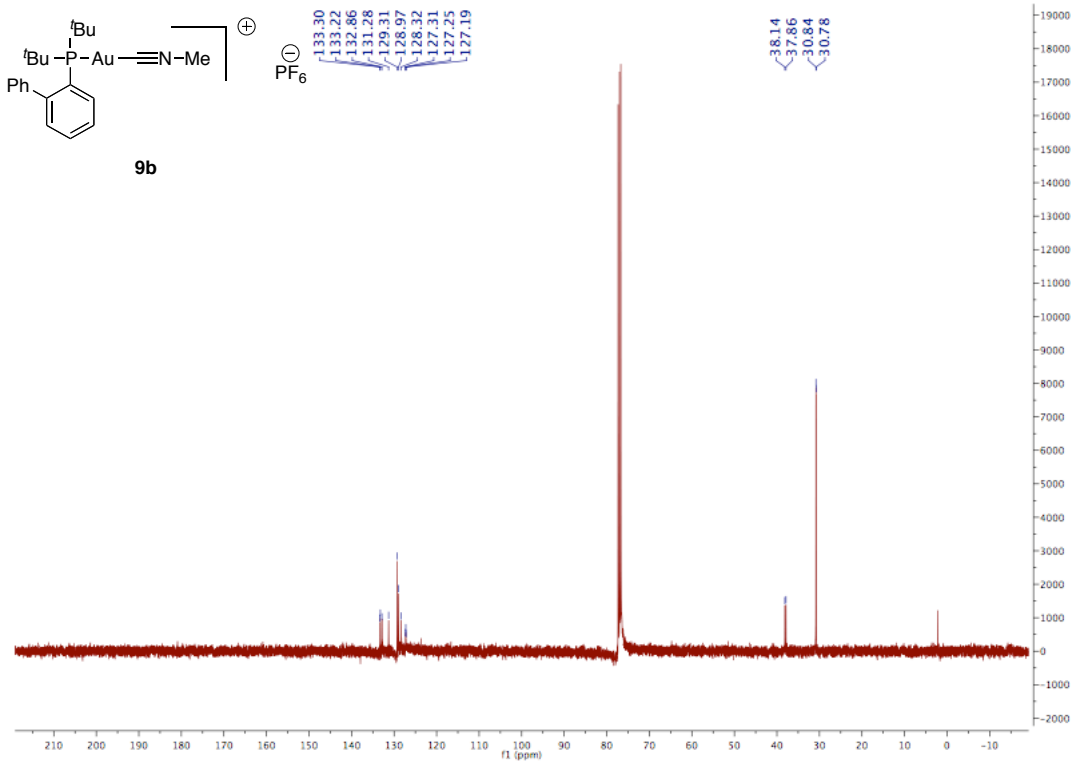


^{1}H NMR



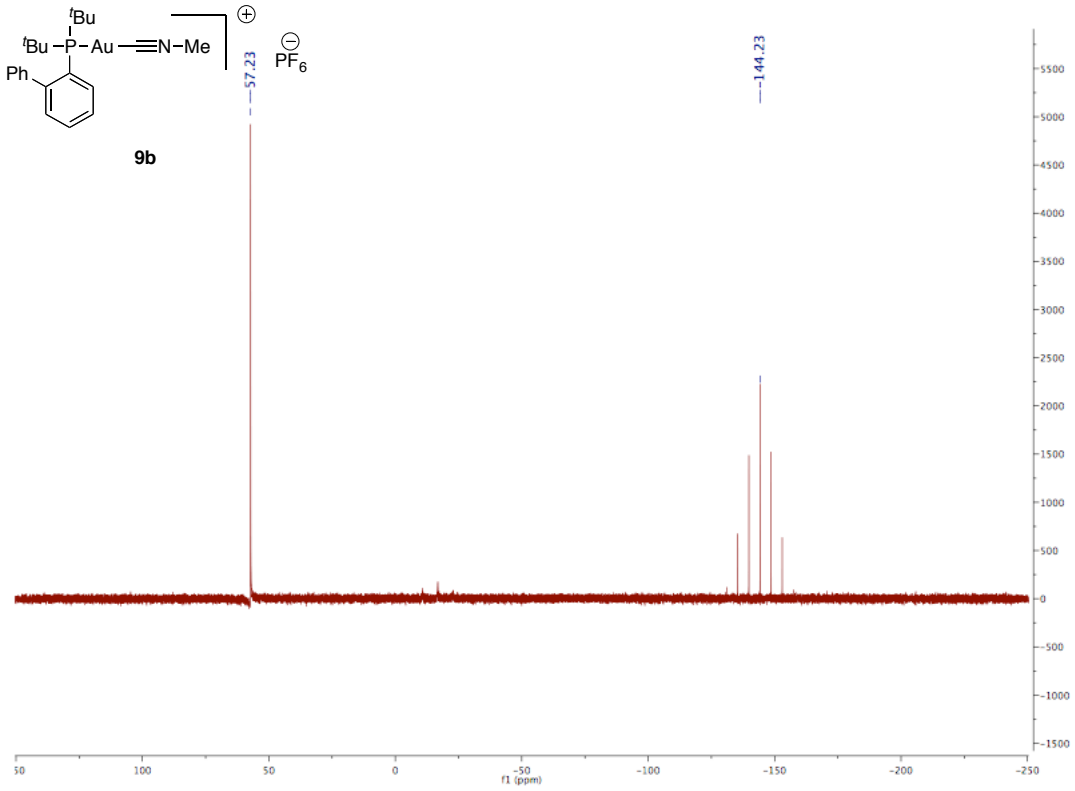
9b

^{13}C NMR



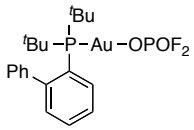
9b

^{31}P NMR



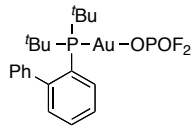
9b

^{1}H NMR



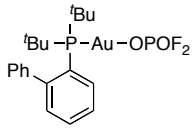
9c

^{13}C NMR



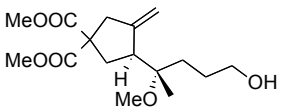
9c

^{31}P NMR



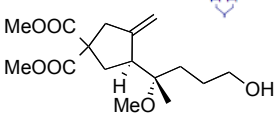
9c

^{1}H NMR



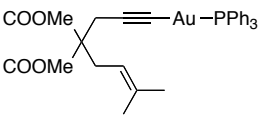
17

^{13}C NMR



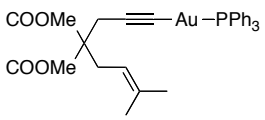
17

^{1}H NMR



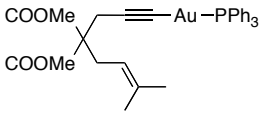
18

^{13}C NMR



18

^{31}P NMR



18

Crystal data and structure refinement for Ag(I) dimeric complex **5**.

Empirical formula	C59.60 H47.99 Ag Cl2.39 O4.84 P Si2	
Formula weight	1121.30	
Temperature	100(2) K	
Wavelength	0.71073 Å	
Crystal system	Orthorhombic	
Space group	P2(1)2(1)2	
Unit cell dimensions	a = 20.2597(6) Å	⟨= 90.00 °.
	b = 16.3556(5) Å	® = 90.00 °.
	c = 17.3458(5) Å	© = 90.00 °.
Volume	5747.7(3) $Å^3$	
Z	4	
Density (calculated)	1.296 Mg/m^3	
Absorption coefficient	0.576 mm^{-1}	
F(000)	2300	
Crystal size	0.20 x 0.15 x 0.05 mm^3	
Theta range for data collection	1.17 to 36.51 °.	
Index ranges	-33 <=h<=31 ,-27 <=k<=26 ,-28 <=l<=28	
Reflections collected	26827	
Independent reflections	17149 [R(int) = 0.0592]	
Completeness to theta =36.51 °	0.984 %	
Absorption correction	Empirical	
Max. and min. transmission	0.9717 and 0.8934	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	26827 / 216 / 684	
Goodness-of-fit on F^2	1.023	
Final R indices [I>2sigma(I)]	R1 = 0.0692 , wR2 = 0.1898	
R indices (all data)	R1 = 0.1174 , wR2 = 0.2312	
Absolute Structure Flack parameter	x =-0.06(3)	
Largest diff. peak and hole	1.835 and -0.881 e.$Å^{-3}$	

Bond lengths [Å] and angles [°] for **5**.

Bond lengths----	
Ag1-O3#1	2.1780(18)
Ag1-O3	2.1780(18)
Ag1-Ag2	3.0727(3)
Ag2-O4	2.1901(18)
Ag2-O4#1	2.1901(18)
C1-C6	1.370(5)
C1-C2	1.412(5)
C1-Si1	1.920(4)
C2-C3	1.419(5)
C3-C4	1.370(6)
C4-C5	1.360(7)
C5-C6	1.470(6)
C7-C8'	1.375(10)
C7-C8	1.390(7)
C7-C12	1.424(6)
C7-C12'	1.481(17)
C7-Si1	1.861(4)
C8-C9	1.345(8)
C9-C10	1.361(9)
C10-C11	1.387(9)
C11-C12	1.397(8)
C8'-C9'	1.578(17)
C9'-C10'	1.37(2)
C10'-C11'	1.25(3)
C11'-C12'	1.35(3)
C13-C14	1.399(4)
C13-C18	1.402(4)
C13-Si1	1.877(3)
C14-C15	1.409(5)
C15-C16	1.386(5)
C16-C17	1.370(5)
C17-C18	1.395(4)
C19-C20	1.381(3)
C19-C28	1.422(3)
C19-Si1	1.883(3)

C20-C21	1.412(4)
C21-C26	1.414(3)
C21-C22	1.420(4)
C22-C23	1.366(5)
C23-C24	1.409(5)
C24-C25	1.388(4)
C25-C26	1.412(4)
C26-C27	1.434(3)
C27-C28	1.377(3)
C27-C29	1.479(3)
C28-O1	1.388(3)
C29-C38	1.387(3)
C29-C30	1.432(3)
C30-C31	1.401(4)
C30-C35	1.444(4)
C31-C32	1.372(4)
C32-C33	1.406(5)
C33-C34	1.354(5)
C34-C35	1.426(4)
C35-C36	1.419(5)
C36-C37	1.357(4)
C37-C38	1.420(3)
C37-Si2	1.907(3)
C38-O2	1.395(3)
C39-C40	1.3900
C39-C44	1.3900
C39-Si2	1.993(2)
C40-C41	1.3900
C41-C42	1.3900
C42-C43	1.3900
C43-C44	1.3900
C39'-C40'	1.3900
C39'-C44'	1.3900
C39'-Si2	1.749(2)
C40'-C41'	1.3900
C41'-C42'	1.3900
C42'-C43'	1.3900
C43'-C44'	1.3900

C45-C50	1.393(5)
C45-C46	1.398(5)
C45-Si2	1.868(3)
C46-C47	1.403(5)
C47-C48	1.349(6)
C48-C49	1.364(6)
C49-C50	1.401(5)
C51-C52	1.3900
C51-C56	1.3900
C51-Si2	1.933(3)
C52-C53	1.3900
C53-C54	1.3900
C54-C55	1.3900
C55-C56	1.3900
C51'-C52'	1.3900
C51'-C56'	1.3900
C51'-Si2	1.834(3)
C52'-C53'	1.3900
C53'-C54'	1.3900
C53'-C53'#2	2.010(8)
C54'-C55'	1.3900
C55'-C56'	1.3900
O1-P1	1.6146(16)
O2-P1	1.6052(17)
O3-P1	1.4845(18)
O4-P1	1.4811(18)
C1D-Cl1D	1.737(4)
C1D-Cl1D#2	1.737(4)
C1L-Cl1L	1.623(4)
C1L-Cl2L	1.827(4)
C1H-C2H	1.5457
C2H-C3H	1.5451
C3H-C4H	1.5415
C4H-C5H	1.5405
C5H-C6H	1.5385
C1H'-C2H'	1.5593
C2H'-C3H'	1.5581
C3H'-C4H'	1.5397

C4H'-C5H'	1.5372
C5H'-C6H'	1.5399
C1E-Cl1E	1.6260
C1E-Cl2E	1.8364

Angles----------

O3-Ag1-O3#1	166.66(9)
O3-Ag1-Ag2#1	83.33(4)
O3-Ag1-Ag2	83.33(4)
O4-Ag2-O4#1	167.23(9)
O4-Ag2-Ag1	83.61(4)
O4-Ag2-Ag1#1	83.61(4)
C6-C1-C2	119.9(3)
C6-C1-Si1	123.3(3)
C2-C1-Si1	116.8(2)
C1-C2-C3	121.0(3)
C4-C3-C2	118.4(4)
C5-C4-C3	122.3(4)
C4-C5-C6	119.9(4)
C1-C6-C5	118.4(4)
C8'-C7-C8	12.6(5)
C8'-C7-C12	122.6(5)
C8-C7-C12	119.3(4)
C8'-C7-C12'	100.3(9)
C8-C7-C12'	90.9(9)
C12-C7-C12'	40.3(10)
C8'-C7-Si1	122.6(4)
C8-C7-Si1	127.0(3)
C12-C7-Si1	113.7(3)
C12'-C7-Si1	131.7(7)
C9-C8-C7	119.4(6)
C8-C9-C10	122.3(6)
C9-C10-C11	120.2(6)
C10-C11-C12	119.2(5)
C11-C12-C7	118.9(5)
C7-C8'-C9'	124.3(9)
C10'-C9'-C8'	113.0(14)
C11'-C10'-C9'	122.0(14)

C10'-C11'-C12'	114.0(15)
C11'-C12'-C7	129.7(16)
C14-C13-C18	117.1(3)
C14-C13-Si1	120.5(2)
C18-C13-Si1	122.3(2)
C13-C14-C15	122.3(3)
C16-C15-C14	118.5(3)
C17-C16-C15	120.3(3)
C16-C17-C18	121.2(3)
C17-C18-C13	120.6(3)
C20-C19-C28	116.4(2)
C20-C19-Si1	121.63(18)
C28-C19-Si1	122.01(17)
C19-C20-C21	122.6(2)
C20-C21-C26	119.0(2)
C20-C21-C22	121.7(2)
C26-C21-C22	119.3(3)
C23-C22-C21	120.9(3)
C22-C23-C24	120.3(3)
C25-C24-C23	119.8(3)
C24-C25-C26	120.9(3)
C25-C26-C21	118.8(2)
C25-C26-C27	121.6(2)
C21-C26-C27	119.5(2)
C28-C27-C26	117.9(2)
C28-C27-C29	120.7(2)
C26-C27-C29	121.4(2)
C27-C28-O1	118.98(18)
C27-C28-C19	123.7(2)
O1-C28-C19	117.22(19)
C38-C29-C30	118.2(2)
C38-C29-C27	120.6(2)
C30-C29-C27	121.1(2)
C31-C30-C29	123.2(2)
C31-C30-C35	118.9(2)
C29-C30-C35	117.9(2)
C32-C31-C30	121.5(3)
C31-C32-C33	120.0(3)

C34-C33-C32	120.5(3)
C33-C34-C35	121.6(3)
C36-C35-C34	122.5(3)
C36-C35-C30	120.0(2)
C34-C35-C30	117.5(3)
C37-C36-C35	121.7(2)
C36-C37-C38	117.9(3)
C36-C37-Si2	121.1(2)
C38-C37-Si2	120.9(2)
C29-C38-O2	118.9(2)
C29-C38-C37	123.5(2)
O2-C38-C37	117.4(2)
C40-C39-C44	120.0
C40-C39-Si2	122.71(11)
C44-C39-Si2	116.93(11)
C41-C40-C39	120.0
C40-C41-C42	120.0
C43-C42-C41	120.0
C42-C43-C44	120.0
C43-C44-C39	120.0
C40'-C39'-C44'	120.0
C40'-C39'-Si2	121.68(13)
C44'-C39'-Si2	118.31(13)
C39'-C40'-C41'	120.0
C42'-C41'-C40'	120.0
C43'-C42'-C41'	120.0
C44'-C43'-C42'	120.0
C43'-C44'-C39'	120.0
C50-C45-C46	118.0(3)
C50-C45-Si2	119.5(3)
C46-C45-Si2	122.5(3)
C45-C46-C47	120.4(4)
C48-C47-C46	119.9(4)
C47-C48-C49	121.4(3)
C48-C49-C50	119.7(3)
C45-C50-C49	120.6(4)
C52-C51-C56	120.0
C52-C51-Si2	125.13(17)

C56-C51-Si2	114.87(17)
C51-C52-C53	120.0
C54-C53-C52	120.0
C55-C54-C53	120.0
C54-C55-C56	120.0
C55-C56-C51	120.0
C52'-C51'-C56'	120.0
C52'-C51'-Si2	120.6(2)
C56'-C51'-Si2	118.7(2)
C51'-C52'-C53'	120.0
C54'-C53'-C52'	120.0
C54'-C53'-C53'#2	98.0(5)
C52'-C53'-C53'#2	120.0(5)
C55'-C54'-C53'	120.0
C56'-C55'-C54'	120.0
C55'-C56'-C51'	120.0
C28-O1-P1	120.68(14)
C38-O2-P1	120.51(15)
P1-O3-Ag1	126.57(10)
P1-O4-Ag2	125.76(11)
O4-P1-O3	120.66(10)
O4-P1-O2	111.22(10)
O3-P1-O2	104.28(10)
O4-P1-O1	103.88(9)
O3-P1-O1	112.01(9)
O2-P1-O1	103.69(9)
C7-Si1-C13	105.48(14)
C7-Si1-C19	113.20(14)
C13-Si1-C19	109.33(12)
C7-Si1-C1	112.66(18)
C13-Si1-C1	108.23(13)
C19-Si1-C1	107.79(13)
C39'-Si2-C51'	90.47(14)
C39'-Si2-C45	113.87(14)
C51'-Si2-C45	112.00(16)
C39'-Si2-C37	115.00(12)
C51'-Si2-C37	113.66(16)
C45-Si2-C37	110.57(13)

C39'-Si2-C51	105.21(13)
C51'-Si2-C51	14.8
C45-Si2-C51	106.11(15)
C37-Si2-C51	105.14(15)
C39'-Si2-C39	10.4
C51'-Si2-C39	100.57(13)
C45-Si2-C39	111.58(13)
C37-Si2-C39	108.03(11)
C51-Si2-C39	115.23(13)
Cl1D-C1D-Cl1D#2	115.6(4)
Cl1L-C1L-Cl2L	116.9(3)
C3H-C2H-C1H	150.0
C4H-C3H-C2H	150.9
C5H-C4H-C3H	115.7
C6H-C5H-C4H	103.7
C3H'-C2H'-C1H'	141.3
C4H'-C3H'-C2H'	146.7
C5H'-C4H'-C3H'	118.3
C4H'-C5H'-C6H'	103.8
Cl1E-C1E-Cl2E	118.0

Symmetry transformations used to generate equivalent atoms:

#1 -x+1, -y+1, z

#2 -x+1, -y+1, z

Torsion angles [°] for **5**.

O3#1-Ag1-Ag2-O4	178.43(7)
O3-Ag1-Ag2-O4	-1.57(7)
O3#1-Ag1-Ag2-O4#1	-1.58(7)
O3-Ag1-Ag2-O4#1	178.42(7)
C6-C1-C2-C3	1.1(5)
Si1-C1-C2-C3	-179.6(3)
C1-C2-C3-C4	-2.6(6)
C2-C3-C4-C5	1.5(6)
C3-C4-C5-C6	1.1(6)
C2-C1-C6-C5	1.5(5)
Si1-C1-C6-C5	-177.8(2)
C4-C5-C6-C1	-2.6(5)
C8'-C7-C8-C9	100(3)
C12-C7-C8-C9	-9.0(8)
C12'-C7-C8-C9	-38.9(11)
Si1-C7-C8-C9	173.4(4)
C7-C8-C9-C10	10.4(10)
C8-C9-C10-C11	-4.6(11)
C9-C10-C11-C12	-2.3(11)
C10-C11-C12-C7	3.3(9)
C8'-C7-C12-C11	-11.9(9)
C8-C7-C12-C11	2.3(8)
C12'-C7-C12-C11	52.8(12)
Si1-C7-C12-C11	-179.9(5)
C8-C7-C8'-C9'	-41(2)
C12-C7-C8'-C9'	37.4(14)
C12'-C7-C8'-C9'	1.0(15)
Si1-C7-C8'-C9'	-155.7(10)
C7-C8'-C9'-C10'	-26.6(19)
C8'-C9'-C10'-C11'	21(3)
C9'-C10'-C11'-C12'	9(3)
C10'-C11'-C12'-C7	-47(4)
C8'-C7-C12'-C11'	38(3)
C8-C7-C12'-C11'	46(3)
C12-C7-C12'-C11'	-92(3)
Si1-C7-C12'-C11'	-169(2)

C18-C13-C14-C15	-1.3(5)
Si1-C13-C14-C15	174.4(3)
C13-C14-C15-C16	0.1(6)
C14-C15-C16-C17	0.9(6)
C15-C16-C17-C18	-0.5(6)
C16-C17-C18-C13	-0.8(6)
C14-C13-C18-C17	1.7(5)
Si1-C13-C18-C17	-174.0(3)
C28-C19-C20-C21	-0.6(3)
Si1-C19-C20-C21	179.59(19)
C19-C20-C21-C26	6.1(4)
C19-C20-C21-C22	-173.6(3)
C20-C21-C22-C23	179.1(3)
C26-C21-C22-C23	-0.7(4)
C21-C22-C23-C24	0.0(5)
C22-C23-C24-C25	0.8(5)
C23-C24-C25-C26	-1.0(4)
C24-C25-C26-C21	0.4(4)
C24-C25-C26-C27	-175.3(3)
C20-C21-C26-C25	-179.3(2)
C22-C21-C26-C25	0.5(4)
C20-C21-C26-C27	-3.5(4)
C22-C21-C26-C27	176.3(2)
C25-C26-C27-C28	171.1(2)
C21-C26-C27-C28	-4.5(3)
C25-C26-C27-C29	-6.6(4)
C21-C26-C27-C29	177.7(2)
C26-C27-C28-O1	-172.24(19)
C29-C27-C28-O1	5.5(3)
C26-C27-C28-C19	10.7(3)
C29-C27-C28-C19	-171.5(2)
C20-C19-C28-C27	-8.2(3)
Si1-C19-C28-C27	171.66(18)
C20-C19-C28-O1	174.71(19)
Si1-C19-C28-O1	-5.5(3)
C28-C27-C29-C38	-55.5(3)
C26-C27-C29-C38	122.2(3)
C28-C27-C29-C30	122.9(3)

C26-C27-C29-C30	-59.4(3)
C38-C29-C30-C31	172.9(2)
C27-C29-C30-C31	-5.6(4)
C38-C29-C30-C35	-6.3(3)
C27-C29-C30-C35	175.3(2)
C29-C30-C31-C32	-178.9(3)
C35-C30-C31-C32	0.2(4)
C30-C31-C32-C33	-0.9(5)
C31-C32-C33-C34	0.5(5)
C32-C33-C34-C35	0.6(5)
C33-C34-C35-C36	179.6(3)
C33-C34-C35-C30	-1.3(5)
C31-C30-C35-C36	180.0(3)
C29-C30-C35-C36	-0.8(4)
C31-C30-C35-C34	0.8(4)
C29-C30-C35-C34	-180.0(3)
C34-C35-C36-C37	-175.9(3)
C30-C35-C36-C37	5.0(4)
C35-C36-C37-C38	-1.8(4)
C35-C36-C37-Si2	-178.2(2)
C30-C29-C38-O2	-174.7(2)
C27-C29-C38-O2	3.7(3)
C30-C29-C38-C37	10.0(4)
C27-C29-C38-C37	-171.6(2)
C36-C37-C38-C29	-5.9(4)
Si2-C37-C38-C29	170.50(19)
C36-C37-C38-O2	178.7(2)
Si2-C37-C38-O2	-4.9(3)
C44-C39-C40-C41	0.0
Si2-C39-C40-C41	-172.83(13)
C39-C40-C41-C42	0.0
C40-C41-C42-C43	0.0
C41-C42-C43-C44	0.0
C42-C43-C44-C39	0.0
C40-C39-C44-C43	0.0
Si2-C39-C44-C43	173.24(13)
C44'-C39'-C40'-C41'	0.0
Si2-C39'-C40'-C41'	178.71(15)

C39'-C40'-C41'-C42'	0.0
C40'-C41'-C42'-C43'	0.0
C41'-C42'-C43'-C44'	0.0
C42'-C43'-C44'-C39'	0.0
C40'-C39'-C44'-C43'	0.0
Si2-C39'-C44'-C43'	-178.75(15)
C50-C45-C46-C47	-1.6(5)
Si2-C45-C46-C47	-179.0(3)
C45-C46-C47-C48	0.8(6)
C46-C47-C48-C49	0.1(6)
C47-C48-C49-C50	-0.2(5)
C46-C45-C50-C49	1.4(5)
Si2-C45-C50-C49	178.9(2)
C48-C49-C50-C45	-0.5(5)
C56-C51-C52-C53	0.0
Si2-C51-C52-C53	179.3(3)
C51-C52-C53-C54	0.0
C52-C53-C54-C55	0.0
C53-C54-C55-C56	0.0
C54-C55-C56-C51	0.0
C52-C51-C56-C55	0.0
Si2-C51-C56-C55	-179.4(2)
C56'-C51'-C52'-C53'	0.0
Si2-C51'-C52'-C53'	-170.1(2)
C51'-C52'-C53'-C54'	0.0
C51'-C52'-C53'-C53'#2	121.4(3)
C52'-C53'-C54'-C55'	0.0
C53'#2-C53'-C54'-C55'	-131.71(19)
C53'-C54'-C55'-C56'	0.0
C54'-C55'-C56'-C51'	0.0
C52'-C51'-C56'-C55'	0.0
Si2-C51'-C56'-C55'	170.3(2)
C27-C28-O1-P1	69.0(2)
C19-C28-O1-P1	-113.76(19)
C29-C38-O2-P1	69.6(3)
C37-C38-O2-P1	-114.8(2)
O3#1-Ag1-O3-P1	1.44(12)
Ag2-Ag1-O3-P1	1.44(12)

O4#1-Ag2-O4-P1	2.37(12)
Ag1-Ag2-O4-P1	2.38(12)
Ag2-O4-P1-O3	-2.10(18)
Ag2-O4-P1-O2	120.42(12)
Ag2-O4-P1-O1	-128.64(11)
Ag1-O3-P1-O4	-0.20(18)
Ag1-O3-P1-O2	-126.00(12)
Ag1-O3-P1-O1	122.52(12)
C38-O2-P1-O4	66.84(19)
C38-O2-P1-O3	-161.60(17)
C38-O2-P1-O1	-44.22(18)
C28-O1-P1-O4	-161.65(15)
C28-O1-P1-O3	66.55(17)
C28-O1-P1-O2	-45.30(16)
C8'-C7-Si1-C13	130.1(6)
C8-C7-Si1-C13	115.7(4)
C12-C7-Si1-C13	-62.0(4)
C12'-C7-Si1-C13	-18.5(14)
C8'-C7-Si1-C19	10.6(6)
C8-C7-Si1-C19	-3.8(5)
C12-C7-Si1-C19	178.5(3)
C12'-C7-Si1-C19	-138.0(14)
C8'-C7-Si1-C1	-112.1(6)
C8-C7-Si1-C1	-126.5(4)
C12-C7-Si1-C1	55.8(4)
C12'-C7-Si1-C1	99.3(14)
C14-C13-Si1-C7	-57.5(3)
C18-C13-Si1-C7	118.0(3)
C14-C13-Si1-C19	64.5(3)
C18-C13-Si1-C19	-120.0(3)
C14-C13-Si1-C1	-178.3(3)
C18-C13-Si1-C1	-2.8(3)
C20-C19-Si1-C7	129.7(2)
C28-C19-Si1-C7	-50.1(2)
C20-C19-Si1-C13	12.4(2)
C28-C19-Si1-C13	-167.39(19)
C20-C19-Si1-C1	-105.0(2)
C28-C19-Si1-C1	75.2(2)

C6-C1-Si1-C7	-9.5(3)
C2-C1-Si1-C7	171.2(2)
C6-C1-Si1-C13	106.7(3)
C2-C1-Si1-C13	-72.6(3)
C6-C1-Si1-C19	-135.2(3)
C2-C1-Si1-C19	45.6(3)
C40'-C39'-Si2-C51'	125.88(18)
C44'-C39'-Si2-C51'	-55.39(18)
C40'-C39'-Si2-C45	-119.71(16)
C44'-C39'-Si2-C45	59.02(17)
C40'-C39'-Si2-C37	9.36(18)
C44'-C39'-Si2-C37	-171.91(15)
C40'-C39'-Si2-C51	124.53(17)
C44'-C39'-Si2-C51	-56.74(18)
C40'-C39'-Si2-C39	-40.27(5)
C44'-C39'-Si2-C39	138.46(14)
C52'-C51'-Si2-C39'	117.6(2)
C56'-C51'-Si2-C39'	-52.6(2)
C52'-C51'-Si2-C45	1.5(3)
C56'-C51'-Si2-C45	-168.7(2)
C52'-C51'-Si2-C37	-124.7(2)
C56'-C51'-Si2-C37	65.1(2)
C52'-C51'-Si2-C51	-67.47(12)
C56'-C51'-Si2-C51	122.29(13)
C52'-C51'-Si2-C39	120.2(2)
C56'-C51'-Si2-C39	-50.1(2)
C50-C45-Si2-C39'	177.4(2)
C46-C45-Si2-C39'	-5.2(3)
C50-C45-Si2-C51'	-81.7(3)
C46-C45-Si2-C51'	95.7(3)
C50-C45-Si2-C37	46.2(3)
C46-C45-Si2-C37	-136.5(3)
C50-C45-Si2-C51	-67.3(3)
C46-C45-Si2-C51	110.0(3)
C50-C45-Si2-C39	166.4(2)
C46-C45-Si2-C39	-16.2(3)
C36-C37-Si2-C39'	118.3(2)
C38-C37-Si2-C39'	-58.0(2)

C36-C37-Si2-C51'	16.0(3)
C38-C37-Si2-C51'	-160.3(2)
C36-C37-Si2-C45	-111.0(2)
C38-C37-Si2-C45	72.7(2)
C36-C37-Si2-C51	3.1(3)
C38-C37-Si2-C51	-173.2(2)
C36-C37-Si2-C39	126.7(2)
C38-C37-Si2-C39	-49.6(2)
C52-C51-Si2-C39'	154.2(2)
C56-C51-Si2-C39'	-26.5(2)
C52-C51-Si2-C51'	148.92(10)
C56-C51-Si2-C51'	-31.75(17)
C52-C51-Si2-C45	33.2(3)
C56-C51-Si2-C45	-147.5(2)
C52-C51-Si2-C37	-84.0(2)
C56-C51-Si2-C37	95.4(2)
C52-C51-Si2-C39	157.2(2)
C56-C51-Si2-C39	-23.5(2)
C40-C39-Si2-C39'	124.03(8)
C44-C39-Si2-C39'	-49.01(15)
C40-C39-Si2-C51'	109.93(18)
C44-C39-Si2-C51'	-63.11(19)
C40-C39-Si2-C45	-131.15(15)
C44-C39-Si2-C45	55.82(16)
C40-C39-Si2-C37	-9.41(16)
C44-C39-Si2-C37	177.55(14)
C40-C39-Si2-C51	107.78(18)
C44-C39-Si2-C51	-65.26(19)
C1H-C2H-C3H-C4H	45.1
C2H-C3H-C4H-C5H	34.6
C3H-C4H-C5H-C6H	-118.9
C1H'-C2H'-C3H'-C4H'	96.4
C2H'-C3H'-C4H'-C5H'	-146.5
C3H'-C4H'-C5H'-C6H'	148.0

Symmetry transformations used to generate equivalent atoms:

#1 -x+1, -y+1, z

#2 -x+1, -y+1, z

Crystal data and structure refinement for **7**·$CHCl_3$

Empirical formula	C75.50 H58.50 Au Cl1.50 O4.50 P2 Si2	
Formula weight	1405.98	
Temperature	100(2) K	
Wavelength	0.71073 Å	
Crystal system	Orthorhombic	
Space group	P2(1)2(1)2(1)	
Unit cell dimensions	a = 11.5423(4) Å	⟨= 90.00 °.
	b = 14.3340(6) Å	® = 90.00 °.
	c = 40.0455(13) Å	© = 90.00 °.
Volume	6625.4(4) $Å^3$	
Z	4	
Density (calculated)	1.410 Mg/m^3	
Absorption coefficient	2.415 mm^{-1}	
F(000)	2840	
Crystal size	0.10 x 0.05 x 0.01 mm^3	
Theta range for data collection	2.48 to 26.45 °.	
Index ranges	-14 <=h<=14 ,-12 <=k<=17 ,-50 <=l<=49	
Reflections collected	13548	
Independent reflections	10065 [R(int) = 0.1441]	
Completeness to theta =26.45 °	0.994 %	
Absorption correction	Empirical	
Max. and min. transmission	0.9762 and 0.7942	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	13548 / 176 / 839	
Goodness-of-fit on F^2	1.022	
Final R indices [I>2sigma(I)]	R1 = 0.0620 , wR2 = 0.1398	
R indices (all data)	R1 = 0.0968 , wR2 = 0.1598	
Largest diff. peak and hole	1.908 and -1.288 e.$Å^{-3}$	

Bond lengths [Å] and angles [°] for **7**·$CHCl_3$.

Bond lengths----	
Au1-O4	2.057(7)
Au1-P2	2.200(3)
C1-O1	1.388(10)
C1-C10	1.391(12)
C1-C2	1.415(11)
O1-P1	1.607(7)
P1-O3	1.463(7)
P1-O4	1.503(7)
P1-O2	1.617(6)
Si1-C21	1.864(9)
Si1-C27	1.867(10)
Si1-C2	1.878(8)
Si1-C33	1.885(10)
C2-C3	1.355(13)
O2-C20	1.402(11)
P2-C63	1.801(11)
P2-C57	1.810(10)
P2-C69	1.823(10)
Si2-C51	1.83(3)
Si2-C45	1.89(3)
Si2-C19	1.91(3)
Si2-C39	1.95(2)
Si2'-C45'	1.85(3)
Si2'-C39'	1.86(3)
Si2'-C19	1.91(3)
Si2'-C51'	1.94(3)
C3-C4	1.433(13)
C4-C5	1.409(13)
C4-C9	1.415(12)
C5-C6	1.368(13)
C6-C7	1.407(13)
C7-C8	1.358(13)
C8-C9	1.445(12)
C9-C10	1.408(13)
C10-C11	1.499(12)

C11-C20	1.392(12)
C11-C12	1.407(13)
C12-C13	1.384(13)
C12-C17	1.422(11)
C13-C14	1.361(13)
C14-C15	1.418(13)
C15-C16	1.348(14)
C16-C17	1.408(13)
C17-C18	1.415(13)
C18-C19	1.381(13)
C19-C20	1.406(12)
C21-C26	1.389(14)
C21-C22	1.418(10)
C22-C23	1.359(13)
C23-C24	1.399(15)
C24-C25	1.385(14)
C25-C26	1.388(14)
C27-C32	1.389(13)
C27-C28	1.431(12)
C28-C29	1.381(14)
C29-C30	1.400(15)
C30-C31	1.375(13)
C31-C32	1.389(13)
C33-C34	1.379(13)
C33-C38	1.39(15)
C34-C35	1.398(13)
C35-C36	1.407(16)
C36-C37	1.383(15)
C37-C38	1.380(14)
C39-C40	1.39
C39-C44	1.39
C40-C41	1.39
C41-C42	1.39
C42-C43	1.39
C43-C44	1.39
C39'-C40'	1.39
C39'-C44'	1.39
C40'-C41'	1.39

C41'-C42'	1.39
C42'-C43'	1.39
C43'-C44'	1.39
C45'-C46'	1.39
C45'-C50'	1.39
C46'-C47'	1.39
C47'-C48'	1.39
C48'-C49'	1.39
C49'-C50'	1.39
C45-C46	1.39
C45-C50	1.39
C46-C47	1.39
C47-C48	1.39
C48-C49	1.39
C49-C50	1.39
C57-C62	1.375(17)
C57-C58	1.426(15)
C58-C59	1.369(15)
C59-C60	1.410(2)
C60-C61	1.383(19)
C61-C62	1.382(16)
C63-C64	1.367(16)
C63-C68	1.379(13)
C64-C65	1.390(17)
C65-C66	1.398(16)
C66-C67	1.352(16)
C67-C68	1.400(14)
C69-C70	1.336(13)
C69-C74	1.381(15)
C70-C71	1.386(15)
C71-C72	1.411(17)
C72-C73	1.314(19)
C73-C74	1.341(17)
C51-C52	1.39
C51-C56	1.39
C52-C53	1.39
C53-C54	1.39
C54-C55	1.39

C55-C56	1.39
C51'-C52'	1.39
C51'-C56'	1.39
C52'-C53'	1.39
C53'-C54'	1.39
C54'-C55'	1.39
C55'-C56'	1.39
C1S-Cl1S	1.68(3)
C1S-Cl2S	1.73(2)
C1S-Cl3S	1.85(3)
O1W-C1W	1.427(10)
C1W-C2W	1.538(10)

Angles----------

O4-Au1-P2	172.69(18)
O1-C1-C10	117.4(6)
O1-C1-C2	118.3(7)
C10-C1-C2	124.0(8)
C1-O1-P1	121.3(6)
O3-P1-O4	118.4(4)
O3-P1-O1	113.4(4)
O4-P1-O1	103.6(4)
O3-P1-O2	107.1(4)
O4-P1-O2	109.7(3)
O1-P1-O2	103.9(3)
C21-Si1-C27	111.0(4)
C21-Si1-C2	107.0(4)
C27-Si1-C2	108.1(4)
C21-Si1-C33	106.3(4)
C27-Si1-C33	111.6(4)
C2-Si1-C33	112.8(4)
C3-C2-C1	115.7(7)
C3-C2-Si1	120.3(6)
C1-C2-Si1	123.9(7)
C20-O2-P1	119.1(6)
C63-P2-C57	107.5(5)
C63-P2-C69	103.7(4)
C57-P2-C69	106.0(4)

C63-P2-Au1	110.1(4)
C57-P2-Au1	111.4(4)
C69-P2-Au1	117.4(3)
C51-Si2-C45	116.5(14)
C51-Si2-C19	117.9(16)
C45-Si2-C19	108.1(14)
C51-Si2-C39	100.5(14)
C45-Si2-C39	107.5(15)
C19-Si2-C39	104.8(12)
C45'-Si2'-C39'	112.7(18)
C45'-Si2'-C19	106.5(15)
C39'-Si2'-C19	110.5(15)
C45'-Si2'-C51'	111.4(15)
C39'-Si2'-C51'	103.7(16)
C19-Si2'-C51'	112.2(17)
C2-C3-C4	124.5(8)
C5-C4-C9	120.9(8)
C5-C4-C3	122.3(8)
C9-C4-C3	116.8(8)
P1-O4-Au1	120.8(4)
C6-C5-C4	120.8(8)
C5-C6-C7	118.6(9)
C8-C7-C6	122.8(8)
C7-C8-C9	119.6(8)
C10-C9-C4	120.9(8)
C10-C9-C8	121.8(8)
C4-C9-C8	117.2(8)
C1-C10-C9	117.4(7)
C1-C10-C11	120.8(8)
C9-C10-C11	121.7(7)
C20-C11-C12	119.9(8)
C20-C11-C10	119.9(8)
C12-C11-C10	119.8(8)
C13-C12-C11	123.9(8)
C13-C12-C17	118.3(8)
C11-C12-C17	117.8(8)
C14-C13-C12	122.3(9)
C13-C14-C15	119.4(10)

C16-C15-C14	119.7(9)
C15-C16-C17	121.5(8)
C16-C17-C18	121.9(8)
C16-C17-C12	118.7(8)
C18-C17-C12	119.4(8)
C19-C18-C17	122.8(8)
C18-C19-C20	116.4(8)
C18-C19-Si2'	113.7(10)
C20-C19-Si2'	129.8(10)
C18-C19-Si2	117.9(10)
C20-C19-Si2	125.2(10)
Si2'-C19-Si2	8.8(14)
C11-C20-O2	119.8(8)
C11-C20-C19	122.6(8)
O2-C20-C19	117.5(8)
C26-C21-C22	115.9(9)
C26-C21-Si1	121.6(6)
C22-C21-Si1	122.2(7)
C23-C22-C21	121.0(9)
C22-C23-C24	122.7(8)
C25-C24-C23	116.8(10)
C24-C25-C26	120.8(10)
C25-C26-C21	122.6(8)
C32-C27-C28	117.4(9)
C32-C27-Si1	121.8(6)
C28-C27-Si1	120.8(7)
C29-C28-C27	120.2(9)
C28-C29-C30	120.9(9)
C31-C30-C29	119.2(9)
C30-C31-C32	120.6(9)
C31-C32-C27	121.7(8)
C34-C33-C38	117.3(9)
C34-C33-Si1	121.3(8)
C38-C33-Si1	121.4(8)
C33-C34-C35	122.1(10)
C34-C35-C36	118.9(9)
C37-C36-C35	119.5(10)
C38-C37-C36	119.8(10)

C37-C38-C33	122.4(10)
C40-C39-C44	120.0
C40-C39-Si2	123.8(12)
C44-C39-Si2	116.1(12)
C41-C40-C39	120.0
C42-C41-C40	120.0
C41-C42-C43	120.0
C44-C43-C42	120.0
C43-C44-C39	120.0
C40'-C39'-C44'	120.0
C40'-C39'-Si2'	118.3(14)
C44'-C39'-Si2'	121.0(14)
C39'-C40'-C41'	120.0
C42'-C41'-C40'	120.0
C43'-C42'-C41'	120.0
C42'-C43'-C44'	120.0
C43'-C44'-C39'	120.0
C46'-C45'-C50'	120.0
C46'-C45'-Si2'	116.4(13)
C50'-C45'-Si2'	123.5(13)
C45'-C46'-C47'	120.0
C48'-C47'-C46'	120.0
C49'-C48'-C47'	120.0
C48'-C49'-C50'	120.0
C49'-C50'-C45'	120.0
C46-C45-C50	120.0
C46-C45-Si2	122.4(10)
C50-C45-Si2	117.6(10)
C47-C46-C45	120.0
C46-C47-C48	120.0
C49-C48-C47	120.0
C50-C49-C48	120.0
C49-C50-C45	120.0
C62-C57-C58	118.7(10)
C62-C57-P2	124.2(9)
C58-C57-P2	117.0(8)
C59-C58-C57	121.4(12)
C58-C59-C60	118.3(12)

C61-C60-C59	120.5(10)
C62-C61-C60	120.6(12)
C57-C62-C61	120.4(12)
C64-C63-C68	117.9(10)
C64-C63-P2	122.4(9)
C68-C63-P2	119.4(8)
C63-C64-C65	122.3(12)
C64-C65-C66	118.5(12)
C67-C66-C65	119.7(11)
C66-C67-C68	120.7(10)
C63-C68-C67	120.6(9)
C70-C69-C74	117.9(10)
C70-C69-P2	124.0(8)
C74-C69-P2	118.1(8)
C69-C70-C71	123.0(10)
C70-C71-C72	117.1(11)
C73-C72-C71	118.4(10)
C72-C73-C74	123.9(12)
C73-C74-C69	119.7(12)
C52-C51-C56	120.0
C52-C51-Si2	119.9(12)
C56-C51-Si2	117.4(12)
C53-C52-C51	120.0
C54-C53-C52	120.0
C53-C54-C55	120.0
C56-C55-C54	120.0
C55-C56-C51	120.0
C52'-C51'-C56'	120.0
C52'-C51'-Si2'	121.7(11)
C56'-C51'-Si2'	118.2(11)
C53'-C52'-C51'	120.0
C52'-C53'-C54'	120.0
C55'-C54'-C53'	120.0
C54'-C55'-C56'	120.0
C55'-C56'-C51'	120.0
Cl1S-C1S-Cl2S	114.5(15)
Cl1S-C1S-Cl3S	109.1(13)
Cl2S-C1S-Cl3S	107.2(14)

O1W-C1W-C2W 97(2)

Torsion angles [°] for **7**·$CHCl_3$.

C10-C1-O1-P1	69.8(10)
C2-C1-O1-P1	-115.0(8)
C1-O1-P1-O3	67.3(7)
C1-O1-P1-O4	-163.2(6)
C1-O1-P1-O2	-48.6(7)
O1-C1-C2-C3	178.6(8)
C10-C1-C2-C3	-6.6(15)
O1-C1-C2-Si1	-5.6(13)
C10-C1-C2-Si1	169.3(8)
C21-Si1-C2-C3	30.3(9)
C27-Si1-C2-C3	-89.4(9)
C33-Si1-C2-C3	146.8(8)
C21-Si1-C2-C1	-145.4(8)
C27-Si1-C2-C1	95.0(8)
C33-Si1-C2-C1	-28.9(10)
O3-P1-O2-C20	-162.4(6)
O4-P1-O2-C20	68.0(7)
O1-P1-O2-C20	-42.2(7)
O4-Au1-P2-C63	43.0(15)
O4-Au1-P2-C57	-76.2(15)
O4-Au1-P2-C69	161.3(14)
C1-C2-C3-C4	0.0(15)
Si1-C2-C3-C4	-176.0(7)
C2-C3-C4-C5	-179.7(10)
C2-C3-C4-C9	2.2(14)
O3-P1-O4-Au1	154.8(4)
O1-P1-O4-Au1	28.4(4)
O2-P1-O4-Au1	-82.0(5)
P2-Au1-O4-P1	-53.6(16)
C9-C4-C5-C6	0.2(15)
C3-C4-C5-C6	-177.9(9)
C4-C5-C6-C7	-1.9(15)
C5-C6-C7-C8	2.1(16)
C6-C7-C8-C9	-0.6(16)

C5-C4-C9-C10	-176.3(9)
C3-C4-C9-C10	1.9(13)
C5-C4-C9-C8	1.2(14)
C3-C4-C9-C8	179.4(9)
C7-C8-C9-C10	176.4(9)
C7-C8-C9-C4	-1.0(15)
O1-C1-C10-C9	-174.6(8)
C2-C1-C10-C9	10.5(15)
O1-C1-C10-C11	7.6(14)
C2-C1-C10-C11	-167.3(9)
C4-C9-C10-C1	-7.8(14)
C8-C9-C10-C1	174.8(9)
C4-C9-C10-C11	169.9(9)
C8-C9-C10-C11	-7.5(15)
C1-C10-C11-C20	-55.6(13)
C9-C10-C11-C20	126.8(10)
C1-C10-C11-C12	117.2(10)
C9-C10-C11-C12	-60.5(12)
C20-C11-C12-C13	170.2(8)
C10-C11-C12-C13	-2.6(13)
C20-C11-C12-C17	-11.3(12)
C10-C11-C12-C17	175.9(8)
C11-C12-C13-C14	177.6(9)
C17-C12-C13-C14	-0.9(13)
C12-C13-C14-C15	-0.4(14)
C13-C14-C15-C16	2.1(14)
C14-C15-C16-C17	-2.6(14)
C15-C16-C17-C18	178.8(9)
C15-C16-C17-C12	1.3(13)
C13-C12-C17-C16	0.5(12)
C11-C12-C17-C16	-178.1(8)
C13-C12-C17-C18	-177.1(8)
C11-C12-C17-C18	4.3(12)
C16-C17-C18-C19	-175.4(9)
C12-C17-C18-C19	2.1(13)
C17-C18-C19-C20	-1.4(13)
C17-C18-C19-Si2'	179.7(12)
C17-C18-C19-Si2	171.1(11)

C45'-Si2'-C19-C18	-107.1(13)
C39'-Si2'-C19-C18	16(2)
C51'-Si2'-C19-C18	130.8(12)
C45'-Si2'-C19-C20	74.2(19)
C39'-Si2'-C19-C20	-163.1(12)
C51'-Si2'-C19-C20	-47.9(19)
C45'-Si2'-C19-Si2	13(10)
C39'-Si2'-C19-Si2	135(12)
C51'-Si2'-C19-Si2	-109(11)
C51-Si2-C19-C18	142.4(11)
C45-Si2-C19-C18	-82.7(12)
C39-Si2-C19-C18	31.7(18)
C51-Si2-C19-C20	-45.8(18)
C45-Si2-C19-C20	89.1(15)
C39-Si2-C19-C20	-156.5(11)
C51-Si2-C19-Si2'	79(11)
C45-Si2-C19-Si2'	-147(12)
C39-Si2-C19-Si2'	-32(10)
C12-C11-C20-O2	-171.6(7)
C10-C11-C20-O2	1.1(12)
C12-C11-C20-C19	12.5(13)
C10-C11-C20-C19	-174.7(8)
P1-O2-C20-C11	70.3(9)
P1-O2-C20-C19	-113.7(8)
C18-C19-C20-C11	-5.9(13)
Si2'-C19-C20-C11	172.7(13)
Si2-C19-C20-C11	-177.8(12)
C18-C19-C20-O2	178.2(7)
Si2'-C19-C20-O2	-3.2(17)
Si2-C19-C20-O2	6.3(15)
C27-Si1-C21-C26	160.7(8)
C2-Si1-C21-C26	43.0(9)
C33-Si1-C21-C26	-77.8(8)
C27-Si1-C21-C22	-25.4(9)
C2-Si1-C21-C22	-143.2(8)
C33-Si1-C21-C22	96.1(8)
C26-C21-C22-C23	3.2(14)
Si1-C21-C22-C23	-171.0(8)

C21-C22-C23-C24	-2.9(16)
C22-C23-C24-C25	0.6(17)
C23-C24-C25-C26	1.2(18)
C24-C25-C26-C21	-0.8(18)
C22-C21-C26-C25	-1.4(15)
Si1-C21-C26-C25	172.9(9)
C21-Si1-C27-C32	-118.4(8)
C2-Si1-C27-C32	-1.3(9)
C33-Si1-C27-C32	123.2(8)
C21-Si1-C27-C28	61.7(8)
C2-Si1-C27-C28	178.8(7)
C33-Si1-C27-C28	-56.6(8)
C32-C27-C28-C29	2.2(13)
Si1-C27-C28-C29	-178.0(8)
C27-C28-C29-C30	-0.1(15)
C28-C29-C30-C31	-0.9(16)
C29-C30-C31-C32	-0.3(15)
C30-C31-C32-C27	2.5(15)
C28-C27-C32-C31	-3.4(14)
Si1-C27-C32-C31	176.8(8)
C21-Si1-C33-C34	-150.6(6)
C27-Si1-C33-C34	-29.4(7)
C2-Si1-C33-C34	92.5(7)
C21-Si1-C33-C38	30.3(7)
C27-Si1-C33-C38	151.4(6)
C2-Si1-C33-C38	-86.7(7)
C38-C33-C34-C35	-0.7(11)
Si1-C33-C34-C35	-179.8(6)
C33-C34-C35-C36	0.4(12)
C34-C35-C36-C37	-0.7(13)
C35-C36-C37-C38	1.2(13)
C36-C37-C38-C33	-1.5(12)
C34-C33-C38-C37	1.2(11)
Si1-C33-C38-C37	-179.6(6)
C51-Si2-C39-C40	104.6(14)
C45-Si2-C39-C40	-18(2)
C19-Si2-C39-C40	-132.6(12)
C51-Si2-C39-C44	-71.8(16)

C45-Si2-C39-C44	165.9(12)
C19-Si2-C39-C44	51.0(18)
C44-C39-C40-C41	0.0
Si2-C39-C40-C41	-176.3(17)
C39-C40-C41-C42	0.0
C40-C41-C42-C43	0.0
C41-C42-C43-C44	0.0
C42-C43-C44-C39	0.0
C40-C39-C44-C43	0.0
Si2-C39-C44-C43	176.6(16)
C45'-Si2'-C39'-C40'	-11(2)
C19-Si2'-C39'-C40'	-130.4(14)
C51'-Si2'-C39'-C40'	109.2(16)
C45'-Si2'-C39'-C44'	178.1(14)
C19-Si2'-C39'-C44'	59(2)
C51'-Si2'-C39'-C44'	-61(2)
C44'-C39'-C40'-C41'	0.0
Si2'-C39'-C40'-C41'	-170.5(19)
C39'-C40'-C41'-C42'	0.0
C40'-C41'-C42'-C43'	0.0
C41'-C42'-C43'-C44'	0.0
C42'-C43'-C44'-C39'	0.0
C40'-C39'-C44'-C43'	0.0
Si2'-C39'-C44'-C43'	170(2)
C39'-Si2'-C45'-C46'	-59(2)
C19-Si2'-C45'-C46'	62.6(17)
C51'-Si2'-C45'-C46'	-174.8(13)
C39'-Si2'-C45'-C50'	124.5(16)
C19-Si2'-C45'-C50'	-114.2(14)
C51'-Si2'-C45'-C50'	8(2)
C50'-C45'-C46'-C47'	0.0
Si2'-C45'-C46'-C47'	-176.9(16)
C45'-C46'-C47'-C48'	0.0
C46'-C47'-C48'-C49'	0.0
C47'-C48'-C49'-C50'	0.0
C48'-C49'-C50'-C45'	0.0
C46'-C45'-C50'-C49'	0.0
Si2'-C45'-C50'-C49'	176.7(17)

C51-Si2-C45-C46	-156.4(11)
C19-Si2-C45-C46	68.0(14)
C39-Si2-C45-C46	-44.7(19)
C51-Si2-C45-C50	24.3(19)
C19-Si2-C45-C50	-111.3(12)
C39-Si2-C45-C50	136.1(12)
C50-C45-C46-C47	0.0
Si2-C45-C46-C47	-179.2(14)
C45-C46-C47-C48	0.0
C46-C47-C48-C49	0.0
C47-C48-C49-C50	0.0
C48-C49-C50-C45	0.0
C46-C45-C50-C49	0.0
Si2-C45-C50-C49	179.3(13)
C63-P2-C57-C62	21.1(11)
C69-P2-C57-C62	-89.4(10)
Au1-P2-C57-C62	141.8(9)
C63-P2-C57-C58	-159.6(7)
C69-P2-C57-C58	90.0(8)
Au1-P2-C57-C58	-38.9(8)
C62-C57-C58-C59	-3.0(15)
P2-C57-C58-C59	177.6(9)
C57-C58-C59-C60	3.5(16)
C58-C59-C60-C61	-3.9(18)
C59-C60-C61-C62	3.9(19)
C58-C57-C62-C61	2.8(16)
P2-C57-C62-C61	-177.9(9)
C60-C61-C62-C57	-3.3(19)
C57-P2-C63-C64	-74.1(11)
C69-P2-C63-C64	38.0(11)
Au1-P2-C63-C64	164.4(9)
C57-P2-C63-C68	100.6(8)
C69-P2-C63-C68	-147.4(8)
Au1-P2-C63-C68	-21.0(8)
C68-C63-C64-C65	5.5(19)
P2-C63-C64-C65	-179.7(10)
C63-C64-C65-C66	-4(2)
C64-C65-C66-C67	1.2(18)

C65-C66-C67-C68	0.8(16)
C64-C63-C68-C67	-3.5(15)
P2-C63-C68-C67	-178.4(7)
C66-C67-C68-C63	0.4(15)
C63-P2-C69-C70	-116.9(9)
C57-P2-C69-C70	-3.9(10)
Au1-P2-C69-C70	121.4(8)
C63-P2-C69-C74	61.3(10)
C57-P2-C69-C74	174.4(10)
Au1-P2-C69-C74	-60.4(10)
C74-C69-C70-C71	1.6(17)
P2-C69-C70-C71	179.8(9)
C69-C70-C71-C72	-3.2(18)
C70-C71-C72-C73	4(2)
C71-C72-C73-C74	-4(2)
C72-C73-C74-C69	2(3)
C70-C69-C74-C73	-1(2)
P2-C69-C74-C73	-179.3(12)
C45-Si2-C51-C52	-149.3(12)
C19-Si2-C51-C52	-18.1(16)
C39-Si2-C51-C52	95.0(14)
C45-Si2-C51-C56	49.3(16)
C19-Si2-C51-C56	-179.5(9)
C39-Si2-C51-C56	-66.4(14)
C56-C51-C52-C53	0.0
Si2-C51-C52-C53	-160.9(12)
C51-C52-C53-C54	0.0
C52-C53-C54-C55	0.0
C53-C54-C55-C56	0.0
C54-C55-C56-C51	0.0
C52-C51-C56-C55	0.0
Si2-C51-C56-C55	161.4(11)
C45'-Si2'-C51'-C52'	-54(2)
C39'-Si2'-C51'-C52'	-175.9(13)
C19-Si2'-C51'-C52'	64.8(18)
C45'-Si2'-C51'-C56'	123.2(14)
C39'-Si2'-C51'-C56'	2(2)
C19-Si2'-C51'-C56'	-117.5(13)

C56'-C51'-C52'-C53'	0.0
Si2'-C51'-C52'-C53'	177.6(18)
C51'-C52'-C53'-C54'	0.0
C52'-C53'-C54'-C55'	0.0
C53'-C54'-C55'-C56'	0.0
C54'-C55'-C56'-C51'	0.0
C52'-C51'-C56'-C55'	0.0
Si2'-C51'-C56'-C55'	-177.7(17)

Crystal data and structure refinement for **7**·MeOH/H_2O

Empirical formula	C76 H66 Au O7.50 P2 Si2	
Formula weight	1414.37	
Temperature	100(2) K	
Wavelength	0.71073 Å	
Crystal system	Orthorhombic	
Space group	P2(1)2(1)2(1)	
Unit cell dimensions	a = 11.7382(12) Å	⟨= 90.00 °.
	b = 14.4403(14) Å	® = 90.00 °.
	c = 40.493(4) Å	© = 90.00 °.
Volume	6863.7(12) $Å^3$	
Z	4	
Density (calculated)	1.369 Mg/m^3	
Absorption coefficient	2.279 mm^{-1}	
F(000)	2876	
Crystal size	0.20 x 0.03 x 0.01 mm^3	
Theta range for data collection	1.01 to 26.86 °.	
Index ranges	-13 <=h<=14 ,-17 <=k<=10 ,-50 <=l<=51	
Reflections collected	39386	
Independent reflections	12587 [R(int) = 0.0658]	
Completeness to theta =26.86 °	0.967 %	
Absorption correction	Empirical	
Max. and min. transmission	0.9776 and 0.6586	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	12587 / 215 / 904	
Goodness-of-fit on F^2	1.142	
Final R indices [I>2sigma(I)]	R1 = 0.0588 , wR2 = 0.1424	
R indices (all data)	R1 = 0.0644 , wR2 = 0.1464	
Absolute Structure Flack parameter	x =0.028(7)	
Largest diff. peak and hole	1.666 and -3.523 e.$Å^{-3}$	

Bond lengths [Å] and angles [°] for **7**·MeOH/H_2O.

Bond lengths----	
Au1-O4	2.101(3)
Au1-P1	2.2201(14)
C1-C6	1.380(9)
C1-C2	1.423(7)
C1-P1	1.830(5)
C2-C3	1.426(6)
C3-C4	1.378(8)
C4-C5	1.393(8)
C5-C6	1.393(8)
C7-C12	1.396(8)
C7-C8	1.438(7)
C7-P1	1.825(5)
C8-C9	1.396(7)
C9-C10	1.359(9)
C10-C11	1.456(9)
C11-C12	1.396(8)
C13-C14	1.364(7)
C13-C18	1.406(6)
C13-P1	1.858(5)
C14-C15	1.435(7)
C15-C16	1.408(9)
C16-C17	1.386(8)
C17-C18	1.383(7)
C19-C28	1.377(5)
C19-O1	1.412(5)
C19-C20	1.426(5)
C20-C21	1.387(5)
C20-Si1	1.935(4)
C21-C22	1.434(6)
C22-C27	1.427(6)
C22-C23	1.457(5)
C23-C24	1.381(6)
C24-C25	1.424(6)
C25-C26	1.383(6)
C26-C27	1.439(5)

C27-C28	1.454(5)
C28-C29	1.515(5)
C29-C38	1.411(5)
C29-C30	1.456(6)
C30-C35	1.419(5)
C30-C31	1.433(6)
C31-C32	1.358(6)
C32-C33	1.416(6)
C33-C34	1.385(6)
C34-C35	1.425(6)
C35-C36	1.433(6)
C36-C37	1.382(6)
C37-C38	1.418(5)
C37-Si2	1.932(4)
C38-O2	1.428(5)
C39-C44	1.395(7)
C39-C40	1.437(6)
C39-Si1	1.910(4)
C40-C41	1.441(6)
C41-C42	1.408(8)
C42-C43	1.423(7)
C43-C44	1.397(7)
C45-C50	1.415(5)
C45-C46	1.425(7)
C45-Si1	1.904(4)
C46-C47	1.406(7)
C47-C48	1.400(7)
C48-C49	1.399(8)
C49-C50	1.383(6)
C51-C56	1.390(7)
C51-C52	1.417(5)
C51-Si1	1.896(5)
C52-C53	1.397(7)
C53-C54	1.401(7)
C54-C55	1.391(6)
C55-C56	1.416(7)
C57-C58	1.405(6)
C57-C62	1.416(8)

C57-Si2	1.896(5)
C58-C59	1.415(8)
C59-C60	1.400(10)
C60-C61	1.386(8)
C61-C62	1.402(7)
C63-C64	1.406(6)
C63-C68	1.418(6)
C63-Si2	1.915(4)
C64-C65	1.362(7)
C65-C66	1.401(8)
C66-C67	1.381(9)
C67-C68	1.405(7)
C69-C70	1.3900
C69-C74	1.3900
C69-Si2	1.9015(18)
C70-C71	1.3900
C71-C72	1.3900
C72-C73	1.3900
C73-C74	1.3900
C69'-C70'	1.3900
C69'-C74'	1.3900
C69'-Si2	1.910(2)
C70'-C71'	1.3900
C71'-C72'	1.3900
C72'-C73'	1.3900
C73'-C74'	1.3900
C69"-C70"	1.3900
C69"-C74"	1.3900
C69"-Si2	1.8978(19)
C70"-C71"	1.3900
C71"-C72"	1.3900
C72"-C73"	1.3900
C73"-C74"	1.3900
O1-P2	1.629(3)
O2-P2	1.617(3)
O3-P2	1.493(3)
O4-P2	1.505(3)
C1R-O1R	1.431(4)

O1M-C1M	1.425(4)
O1N-C1N	1.437(4)
C1P-O1P	1.414(4)

Angles----------

O4-Au1-P1	172.10(8)
C6-C1-C2	118.5(5)
C6-C1-P1	124.0(4)
C2-C1-P1	117.5(4)
C1-C2-C3	119.1(5)
C4-C3-C2	120.3(5)
C3-C4-C5	120.5(5)
C4-C5-C6	119.3(6)
C1-C6-C5	122.3(6)
C12-C7-C8	119.8(4)
C12-C7-P1	122.1(4)
C8-C7-P1	118.1(4)
C9-C8-C7	118.3(5)
C10-C9-C8	122.5(5)
C9-C10-C11	120.0(5)
C12-C11-C10	118.0(6)
C7-C12-C11	121.4(5)
C14-C13-C18	119.9(5)
C14-C13-P1	117.1(4)
C18-C13-P1	122.9(4)
C13-C14-C15	120.7(5)
C16-C15-C14	117.8(5)
C17-C16-C15	121.0(5)
C18-C17-C16	119.7(5)
C17-C18-C13	120.7(5)
C28-C19-O1	118.7(3)
C28-C19-C20	123.0(3)
O1-C19-C20	117.9(3)
C21-C20-C19	117.8(3)
C21-C20-Si1	118.6(3)
C19-C20-Si1	123.6(3)
C20-C21-C22	121.3(3)
C27-C22-C21	120.1(3)

C27-C22-C23	118.9(4)
C21-C22-C23	121.0(4)
C24-C23-C22	120.5(4)
C23-C24-C25	120.0(4)
C26-C25-C24	120.9(4)
C25-C26-C27	120.7(4)
C22-C27-C26	118.8(3)
C22-C27-C28	118.0(3)
C26-C27-C28	123.2(3)
C19-C28-C27	119.0(3)
C19-C28-C29	119.7(3)
C27-C28-C29	121.2(3)
C38-C29-C30	117.9(3)
C38-C29-C28	122.1(4)
C30-C29-C28	120.0(3)
C35-C30-C31	118.5(4)
C35-C30-C29	118.4(4)
C31-C30-C29	123.1(3)
C32-C31-C30	120.5(4)
C31-C32-C33	121.6(4)
C34-C33-C32	119.3(4)
C33-C34-C35	120.4(4)
C30-C35-C34	119.6(4)
C30-C35-C36	119.7(4)
C34-C35-C36	120.7(3)
C37-C36-C35	123.4(3)
C36-C37-C38	116.0(4)
C36-C37-Si2	116.2(3)
C38-C37-Si2	127.6(3)
C29-C38-C37	124.3(4)
C29-C38-O2	116.6(3)
C37-C38-O2	119.1(3)
C44-C39-C40	118.0(4)
C44-C39-Si1	122.3(3)
C40-C39-Si1	119.6(4)
C39-C40-C41	121.0(5)
C42-C41-C40	118.5(4)
C41-C42-C43	120.1(4)

C44-C43-C42	120.4(5)
C39-C44-C43	121.9(4)
C50-C45-C46	116.4(4)
C50-C45-Si1	122.9(3)
C46-C45-Si1	120.4(3)
C47-C46-C45	121.8(4)
C48-C47-C46	119.8(5)
C49-C48-C47	119.0(5)
C50-C49-C48	121.2(4)
C49-C50-C45	121.8(4)
C56-C51-C52	116.9(4)
C56-C51-Si1	121.7(3)
C52-C51-Si1	121.4(4)
C53-C52-C51	122.1(4)
C52-C53-C54	119.3(4)
C55-C54-C53	120.2(5)
C54-C55-C56	119.3(5)
C51-C56-C55	122.2(4)
C58-C57-C62	117.2(5)
C58-C57-Si2	122.7(4)
C62-C57-Si2	120.1(3)
C57-C58-C59	120.4(6)
C60-C59-C58	122.0(5)
C61-C60-C59	117.4(5)
C60-C61-C62	121.7(6)
C61-C62-C57	121.3(5)
C64-C63-C68	116.9(4)
C64-C63-Si2	125.5(3)
C68-C63-Si2	117.5(3)
C65-C64-C63	122.3(4)
C64-C65-C66	121.0(5)
C67-C66-C65	118.3(5)
C66-C67-C68	121.3(5)
C67-C68-C63	120.1(4)
C70-C69-C74	120.0
C70-C69-Si2	116.60(16)
C74-C69-Si2	122.00(16)
C69-C70-C71	120.0

C72-C71-C70	120.0
C71-C72-C73	120.0
C72-C73-C74	120.0
C73-C74-C69	120.0
C70'-C69'-C74'	120.0
C70'-C69'-Si2	112.24(16)
C74'-C69'-Si2	127.75(16)
C71'-C70'-C69'	120.0
C70'-C71'-C72'	120.0
C73'-C72'-C71'	120.0
C72'-C73'-C74'	120.0
C73'-C74'-C69'	120.0
C70"-C69"-C74"	120.0
C70"-C69"-Si2	115.83(16)
C74"-C69"-Si2	122.84(16)
C69"-C70"-C71"	120.0
C70"-C71"-C72"	120.0
C73"-C72"-C71"	120.0
C74"-C73"-C72"	120.0
C73"-C74"-C69"	120.0
C19-O1-P2	120.6(3)
C38-O2-P2	120.5(3)
P2-O4-Au1	120.63(17)
C7-P1-C1	107.2(2)
C7-P1-C13	104.9(2)
C1-P1-C13	104.6(2)
C7-P1-Au1	111.44(17)
C1-P1-Au1	110.65(18)
C13-P1-Au1	117.30(16)
O3-P2-O4	118.12(17)
O3-P2-O2	106.17(18)
O4-P2-O2	109.67(15)
O3-P2-O1	113.45(16)
O4-P2-O1	104.84(18)
O2-P2-O1	103.68(15)
C51-Si1-C45	110.51(18)
C51-Si1-C39	112.51(18)
C45-Si1-C39	106.7(2)

C51-Si1-C20	108.04(19)
C45-Si1-C20	106.74(17)
C39-Si1-C20	112.20(16)
C57-Si2-C69"	119.95(19)
C57-Si2-C69	111.25(19)
C69"-Si2-C69	8.7
C57-Si2-C69'	103.01(19)
C69"-Si2-C69'	17.2
C69-Si2-C69'	8.6
C57-Si2-C63	109.66(19)
C69"-Si2-C63	98.43(19)
C69-Si2-C63	102.76(19)
C69'-Si2-C63	108.72(18)
C57-Si2-C37	108.0(2)
C69"-Si2-C37	113.76(17)
C69-Si2-C37	118.92(17)
C69'-Si2-C37	121.39(17)
C63-Si2-C37	105.81(18)

Torsion angles [°] for **7**·MeOH/H_2O.

C6-C1-C2-C3	0.8(8)
P1-C1-C2-C3	-178.6(4)
C1-C2-C3-C4	0.7(7)
C2-C3-C4-C5	-1.6(8)
C3-C4-C5-C6	0.9(9)
C2-C1-C6-C5	-1.4(9)
P1-C1-C6-C5	177.9(5)
C4-C5-C6-C1	0.6(10)
C12-C7-C8-C9	0.5(7)
P1-C7-C8-C9	179.7(4)
C7-C8-C9-C10	-0.3(7)
C8-C9-C10-C11	-1.6(8)
C9-C10-C11-C12	3.3(9)
C8-C7-C12-C11	1.4(8)
P1-C7-C12-C11	-177.8(5)
C10-C11-C12-C7	-3.2(9)
C18-C13-C14-C15	-1.0(8)
P1-C13-C14-C15	-178.8(5)
C13-C14-C15-C16	-0.2(9)
C14-C15-C16-C17	0.7(10)
C15-C16-C17-C18	0.1(10)
C16-C17-C18-C13	-1.3(8)
C14-C13-C18-C17	1.8(8)
P1-C13-C18-C17	179.4(4)
C28-C19-C20-C21	-8.6(7)
O1-C19-C20-C21	178.6(4)
C28-C19-C20-Si1	168.6(4)
O1-C19-C20-Si1	-4.2(6)
C19-C20-C21-C22	1.6(7)
Si1-C20-C21-C22	-175.7(4)
C20-C21-C22-C27	2.5(7)
C20-C21-C22-C23	-177.5(5)
C27-C22-C23-C24	1.8(7)
C21-C22-C23-C24	-178.2(5)
C22-C23-C24-C25	-3.1(8)
C23-C24-C25-C26	1.5(8)

C24-C25-C26-C27	1.5(8)
C21-C22-C27-C26	-178.9(4)
C23-C22-C27-C26	1.1(7)
C21-C22-C27-C28	-0.1(7)
C23-C22-C27-C28	179.9(4)
C25-C26-C27-C22	-2.7(7)
C25-C26-C27-C28	178.6(5)
O1-C19-C28-C27	-176.2(4)
C20-C19-C28-C27	11.0(7)
O1-C19-C28-C29	5.7(7)
C20-C19-C28-C29	-167.1(4)
C22-C27-C28-C19	-6.4(7)
C26-C27-C28-C19	172.3(4)
C22-C27-C28-C29	171.7(4)
C26-C27-C28-C29	-9.6(7)
C19-C28-C29-C38	-56.7(6)
C27-C28-C29-C38	125.3(5)
C19-C28-C29-C30	121.6(5)
C27-C28-C29-C30	-56.5(6)
C38-C29-C30-C35	-5.6(6)
C28-C29-C30-C35	176.1(4)
C38-C29-C30-C31	172.1(4)
C28-C29-C30-C31	-6.2(6)
C35-C30-C31-C32	-2.0(6)
C29-C30-C31-C32	-179.8(4)
C30-C31-C32-C33	-1.0(7)
C31-C32-C33-C34	2.7(7)
C32-C33-C34-C35	-1.3(6)
C31-C30-C35-C34	3.4(6)
C29-C30-C35-C34	-178.8(4)
C31-C30-C35-C36	-175.6(4)
C29-C30-C35-C36	2.2(6)
C33-C34-C35-C30	-1.7(6)
C33-C34-C35-C36	177.3(4)
C30-C35-C36-C37	1.6(6)
C34-C35-C36-C37	-177.4(4)
C35-C36-C37-C38	-1.7(6)
C35-C36-C37-Si2	173.7(3)

C30-C29-C38-C37	5.8(6)
C28-C29-C38-C37	-175.9(4)
C30-C29-C38-O2	-173.5(3)
C28-C29-C38-O2	4.7(6)
C36-C37-C38-C29	-2.2(6)
Si2-C37-C38-C29	-177.0(3)
C36-C37-C38-O2	177.2(4)
Si2-C37-C38-O2	2.4(6)
C44-C39-C40-C41	2.3(5)
Si1-C39-C40-C41	-179.0(3)
C39-C40-C41-C42	-1.7(5)
C40-C41-C42-C43	1.2(6)
C41-C42-C43-C44	-1.2(6)
C40-C39-C44-C43	-2.4(5)
Si1-C39-C44-C43	179.0(3)
C42-C43-C44-C39	1.9(6)
C50-C45-C46-C47	-1.4(7)
Si1-C45-C46-C47	172.3(4)
C45-C46-C47-C48	1.3(8)
C46-C47-C48-C49	0.2(8)
C47-C48-C49-C50	-1.7(8)
C48-C49-C50-C45	1.7(7)
C46-C45-C50-C49	-0.1(6)
Si1-C45-C50-C49	-173.6(3)
C56-C51-C52-C53	2.0(6)
Si1-C51-C52-C53	-174.9(3)
C51-C52-C53-C54	-2.3(6)
C52-C53-C54-C55	1.1(6)
C53-C54-C55-C56	0.3(7)
C52-C51-C56-C55	-0.5(6)
Si1-C51-C56-C55	176.4(3)
C54-C55-C56-C51	-0.6(7)
C62-C57-C58-C59	0.5(7)
Si2-C57-C58-C59	178.7(4)
C57-C58-C59-C60	1.7(8)
C58-C59-C60-C61	-2.2(9)
C59-C60-C61-C62	0.5(9)
C60-C61-C62-C57	1.7(9)

C58-C57-C62-C61	-2.2(7)
Si2-C57-C62-C61	179.6(4)
C68-C63-C64-C65	0.7(8)
Si2-C63-C64-C65	-174.7(5)
C63-C64-C65-C66	-1.7(9)
C64-C65-C66-C67	3.1(9)
C65-C66-C67-C68	-3.6(9)
C66-C67-C68-C63	2.7(9)
C64-C63-C68-C67	-1.1(8)
Si2-C63-C68-C67	174.6(4)
C74-C69-C70-C71	0.0
Si2-C69-C70-C71	166.76(17)
C69-C70-C71-C72	0.0
C70-C71-C72-C73	0.0
C71-C72-C73-C74	0.0
C72-C73-C74-C69	0.0
C70-C69-C74-C73	0.0
Si2-C69-C74-C73	-166.03(18)
C74'-C69'-C70'-C71'	0.0
Si2-C69'-C70'-C71'	178.94(16)
C69'-C70'-C71'-C72'	0.0
C70'-C71'-C72'-C73'	0.0
C71'-C72'-C73'-C74'	0.0
C72'-C73'-C74'-C69'	0.0
C70'-C69'-C74'-C73'	0.0
Si2-C69'-C74'-C73'	-178.76(19)
C74"-C69"-C70"-C71"	0.0
Si2-C69"-C70"-C71"	167.18(17)
C69"-C70"-C71"-C72"	0.0
C70"-C71"-C72"-C73"	0.0
C71"-C72"-C73"-C74"	0.0
C72"-C73"-C74"-C69"	0.0
C70"-C69"-C74"-C73"	0.0
Si2-C69"-C74"-C73"	-166.25(18)
C28-C19-O1-P2	69.8(5)
C20-C19-O1-P2	-117.1(4)
C29-C38-O2-P2	69.6(4)
C37-C38-O2-P2	-109.8(4)

P1-Au1-O4-P2	-56.1(7)
C12-C7-P1-C1	24.8(5)
C8-C7-P1-C1	-154.4(4)
C12-C7-P1-C13	-86.1(4)
C8-C7-P1-C13	94.8(4)
C12-C7-P1-Au1	146.0(4)
C8-C7-P1-Au1	-33.2(4)
C6-C1-P1-C7	-80.4(5)
C2-C1-P1-C7	98.9(4)
C6-C1-P1-C13	30.7(6)
C2-C1-P1-C13	-150.0(4)
C6-C1-P1-Au1	157.9(5)
C2-C1-P1-Au1	-22.8(4)
C14-C13-P1-C7	172.6(4)
C18-C13-P1-C7	-5.1(5)
C14-C13-P1-C1	59.9(5)
C18-C13-P1-C1	-117.8(4)
C14-C13-P1-Au1	-63.1(4)
C18-C13-P1-Au1	119.2(4)
O4-Au1-P1-C7	-74.0(6)
O4-Au1-P1-C1	45.2(6)
O4-Au1-P1-C13	165.1(6)
Au1-O4-P2-O3	157.41(17)
Au1-O4-P2-O2	-80.8(2)
Au1-O4-P2-O1	29.9(2)
C38-O2-P2-O3	-164.6(3)
C38-O2-P2-O4	66.7(3)
C38-O2-P2-O1	-44.8(3)
C19-O1-P2-O3	68.3(3)
C19-O1-P2-O4	-161.5(3)
C19-O1-P2-O2	-46.5(3)
C56-C51-Si1-C45	-116.0(3)
C52-C51-Si1-C45	60.9(3)
C56-C51-Si1-C39	124.9(3)
C52-C51-Si1-C39	-58.3(3)
C56-C51-Si1-C20	0.5(4)
C52-C51-Si1-C20	177.3(3)
C50-C45-Si1-C51	-26.1(4)

C46-C45-Si1-C51	160.7(3)
C50-C45-Si1-C39	96.5(4)
C46-C45-Si1-C39	-76.7(4)
C50-C45-Si1-C20	-143.3(4)
C46-C45-Si1-C20	43.5(4)
C44-C39-Si1-C51	150.2(3)
C40-C39-Si1-C51	-28.3(3)
C44-C39-Si1-C45	28.9(3)
C40-C39-Si1-C45	-149.7(3)
C44-C39-Si1-C20	-87.7(3)
C40-C39-Si1-C20	93.8(3)
C21-C20-Si1-C51	-88.5(4)
C19-C20-Si1-C51	94.4(4)
C21-C20-Si1-C45	30.4(4)
C19-C20-Si1-C45	-146.7(4)
C21-C20-Si1-C39	146.9(4)
C19-C20-Si1-C39	-30.2(5)
C58-C57-Si2-C69"	25.4(5)
C62-C57-Si2-C69"	-156.4(4)
C58-C57-Si2-C69	25.1(5)
C62-C57-Si2-C69	-156.8(4)
C58-C57-Si2-C69'	22.5(4)
C62-C57-Si2-C69'	-159.4(4)
C58-C57-Si2-C63	138.1(4)
C62-C57-Si2-C63	-43.8(5)
C58-C57-Si2-C37	-107.1(4)
C62-C57-Si2-C37	71.1(4)
C70"-C69"-Si2-C57	38.0(3)
C74"-C69"-Si2-C57	-155.3(2)
C70"-C69"-Si2-C69	39.95(8)
C74"-C69"-Si2-C69	-153.27(9)
C70"-C69"-Si2-C69'	47.74(9)
C74"-C69"-Si2-C69'	-145.48(8)
C70"-C69"-Si2-C63	-80.6(2)
C74"-C69"-Si2-C63	86.2(2)
C70"-C69"-Si2-C37	167.9(2)
C74"-C69"-Si2-C37	-25.3(2)
C70-C69-Si2-C57	43.0(2)

C74-C69-Si2-C57	-150.5(2)
C70-C69-Si2-C69"	-135.12(7)
C74-C69-Si2-C69"	31.36(11)
C70-C69-Si2-C69'	60.36(8)
C74-C69-Si2-C69'	-133.16(9)
C70-C69-Si2-C63	-74.2(2)
C74-C69-Si2-C63	92.2(2)
C70-C69-Si2-C37	169.4(2)
C74-C69-Si2-C37	-24.1(2)
C70'-C69'-Si2-C57	70.5(2)
C74'-C69'-Si2-C57	-110.7(2)
C70'-C69'-Si2-C69"	-100.83(6)
C74'-C69'-Si2-C69"	78.01(12)
C70'-C69'-Si2-C69	-92.96(7)
C74'-C69'-Si2-C69	85.88(12)
C70'-C69'-Si2-C63	-45.8(2)
C74'-C69'-Si2-C63	133.0(2)
C70'-C69'-Si2-C37	-168.7(2)
C74'-C69'-Si2-C37	10.1(3)
C64-C63-Si2-C57	-17.2(5)
C68-C63-Si2-C57	167.5(4)
C64-C63-Si2-C69"	108.9(5)
C68-C63-Si2-C69"	-66.5(4)
C64-C63-Si2-C69	101.2(5)
C68-C63-Si2-C69	-74.1(4)
C64-C63-Si2-C69'	94.8(5)
C68-C63-Si2-C69'	-80.6(4)
C64-C63-Si2-C37	-133.4(5)
C68-C63-Si2-C37	51.3(4)
C36-C37-Si2-C57	-85.7(4)
C38-C37-Si2-C57	89.1(4)
C36-C37-Si2-C69"	138.6(3)
C38-C37-Si2-C69"	-46.6(4)
C36-C37-Si2-C69	146.4(3)
C38-C37-Si2-C69	-38.8(4)
C36-C37-Si2-C69'	156.0(3)
C38-C37-Si2-C69'	-29.2(5)
C36-C37-Si2-C63	31.7(4)

C38-C37-Si2-C63	-153.5(4)
