Supporting Information for

Programmed Assembly of Two Different Ligands with Metallic Ions: Generation of Self-Supported Noyori-Type Catalysts for Heterogeneous Asymmetric Hydrogenation of Ketones

Yuxue Liang, Qing Jing, Xin Li, Lei Shi, and Kuiling Ding*

State Key Laboratory of Organometallic Chemistry, Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, 354 Fenglin Road, Shanghai 200032, P. R. China

General Methods. Nuclear magnetic resonance (NMR) spectra were recorded on a Varian Mercury VX300 NMR spectrometer (300 MHz) in CDCl₃. Chemical shifts were expressed in ppm with TMS as an internal standard ($\delta = 0$ ppm) for ¹H NMR. Coupling constants, *J*, are listed in hertz. ³¹P NMR spectra were referenced with an external 85% H₃PO₄ sample. ³¹P NMR CP/MAS spectra were measured with a Varian Mercury Plus-400 NMR spectrometer (161.9 MHz) and the chemical shift of spectra were determined by taking the ³¹P of ADP (11.7 ppm) as an external reference standard. ESI mass spectra were obtained on Mariner LC-TOF spectrometer. HRMS were determined on an IonSpect 4.7 TESLA FTMS. C/H/N elemental analyses were performed with an Elemental VARIO EL apparatus. The determination of phosphorus content was carried by acid digestion and followed by phosphovanadomolybdate colorimetry. ICP analysis of Ru leaching and Ru content for the assembled catalyst was performed with IRIS Advantage 1000 instrument. The content of Cl was determined by oxygen flask combustion and titration method. Infrared spectra were obtained on a BIO-RAD FTS-185 Fourier transform spectrometer in KBr pellets. Optical rotations were measured on a Perkin-Elmer 341 automatic polarimeter. GC analyses were carried out on Agilent 6890N system. Scanning electron micrographs were taken on a Hitachi S-450 scanning electron microscope. Powder X-ray diffraction (PXD) spectra were carried out on a Bruker-AXS D8Advance. Anhydrous toluene was distilled from sodium benzophenone ketyl. Anhydrous DMSO, DMF and 2-propanol were freshly distilled from calcium hydride. All manipulations involving air- and moisture-sensitive organometallic compounds were carried out using standard Schlenk technique under argon atmosphere. The bridged BINOL derivative **6** was prepared according to the literature method (H. Guo, X. Wang, K. Ding, *Tetrahedron Lett.* **2004**, 45, 2009-2012).

a) TiF_2O , Et_3N , CH_2Cl_2 , -78°C

b) i. $\text{Ar}_2\text{P}(\text{O})\text{H}$, $\text{Pd}(\text{AcO})_2$ / dppb , $i\text{-Pr}_2\text{NEt}$, 100°C , ii. HSiCl_3 , $i\text{-Pr}_2\text{NEt}$, toluene, 110°C ,
 iii. $\text{Ar}_2\text{P}(\text{O})\text{H}$, $\text{NiCl}_2(\text{dppe})$, Et_3N , 100°C , iv. HSiCl_3 , $i\text{-Pr}_2\text{NEt}$, toluene, 110°C

Synthesis of Compound 7

To a solution of bridged BINOL **6** (3.0 g, 4.5 mmol) in CH_2Cl_2 (50 mL) was added triethylamine (6 mL), and then trifluoromethanesulfonic anhydride (TiF_2O , 4.8 mL, 7.5 g, 27.0 mmol) was added dropwise to the solution at -78°C . The mixture was stirred overnight and the reaction temperature was gradually warmed to room temperature. After removal of the solvent, the residue was diluted with EtOAc (100 mL) and then washed with 5 % aqueous HCl (50 mL), saturated aqueous NaHCO_3 (50 mL) and brine (50 mL). The organic layer was dried over anhydrous Na_2SO_4 , and then concentrated under reduced pressure. The residue was chromatographed on a silica gel column using hexane/ EtOAc (15/1) as eluent to give **7** (5.0 g, 92 %) as a white solid. M.p. $186\text{--}188^\circ\text{C}$. $[\alpha]_{\text{D}}^{20}$ 173.9 (c 0.25, CHCl_3). FT-IR (KBr): 3030, 1600, 1498, 1422, 1248, 1215, 1176, 1158, 1139, 1070, 965, 941, 833, 802, 768, 724, 687. ^1H NMR (300 MHz, CDCl_3): δ 8.14–8.25 (m, 6H), 8.02 (d, $J = 8.1$ Hz, 2H), 7.82 (s, 4H), 7.57–7.74 (m, 8H), 7.44 (t, $J = 7.5$ Hz, 2H). ESI-MS: $[M^+ + \text{H}]$ 1175.6. HRMS (ESI): calcd for $\text{C}_{50}\text{H}_{27}\text{F}_{12}\text{O}_{12}\text{S}_4$ $[M^+ + \text{H}]$: 1175.0194. Found: 1175.0182.

The procedure for the preparation of bridged BINAP 1a:

To a mixture of **7** (1.2 g, 1.02 mmol), diphenylphosphine oxide (0.82 g, 4.08 mmol), palladium acetate (22 mg, 0.10 mmol) and 1,4-bis(diphenylphosphino)butane (dppb , 43 mg, 0.10 mmol) were added degassed DMSO (15 mL) and diisopropylethylamine (2.5 mL, 15 mmol). The mixture was heated with stirring at 100°C for 4 hours. After

cooling to room temperature, the reaction mixture was diluted with CH_2Cl_2 (40 mL), washed with 5% aqueous HCl (20 mL) and brine (20 mL). The organic phase was dried over anhydrous Na_2SO_4 and concentrated under reduced pressure. The residue was purified by silica gel column chromatography with hexane/EtOAc (2/1) as eluent to yield a mixture of diphosphinylated products as an oil (1.2 g), which was used directly for the next HSiCl_3 reduction.

To the mixture (1.2 g) obtained above were added diisopropylethylamine (4 mL, 24 mmol) in toluene (20 mL) and HSiCl_3 (2.0 mL, 19.6 mmol) at 0 °C. The reaction mixture was heated to 110 °C and stirred overnight. After cooling to room temperature, the mixture was diluted with Et_2O and quenched with small amount of saturated aqueous NaHCO_3 solution. The resulting suspension was filtered through a pad of Celite and the solid residue was washed with Et_2O . The combined organic layer was dried over anhydrous Na_2SO_4 and concentrated under reduced pressure. The residue was chromatographed on a silica gel column with hexane/EtOAc (15/1) as eluent to give a mixture of diphosphine products (1.0 g), which was used directly in the next Ni-catalyzed coupling reaction with diphenylphosphine oxide.

A solution of diphenylphosphine oxide (404 mg, 2.0 mmol) and $\text{NiCl}_2(\text{dppe})$ (84 mg, 0.17 mmol) in DMF (10 mL) was stirred at 100 °C for 10 min, and then a solution of the intermediate (1.0 g) obtained in the last step and Et_3N (1.5 mL) in DMF (15 mL) was added and the mixture was stirred at 100 °C for 12 h. After cooling, the mixture was diluted with aqueous NH_4Cl and extracted with CH_2Cl_2 (30 mL $\times$ 3). The organic phase was washed with H_2O , dried and concentrated under reduced pressure. The residue was purified by silica gel column chromatography with hexane/EtOAc (1/1) as eluent to give a yellow solid (556 mg), which was used directly for the next HSiCl_3 reduction.

To the mixture (556 mg) obtained above were added diisopropylethylamine (2 mL, 12 mmol) in toluene (15 mL) and HSiCl_3 (1.0 mL, 9.8 mmol) at 0 °C. The reaction mixture was heated to 110 °C and stirred overnight. After cooling to room temperature, the mixture was diluted with Et_2O and quenched with small amount of saturated aqueous NaHCO_3 solution. The resulting suspension was filtered through a pad of Celite and the solid residue was washed with Et_2O . The combined organic layer was dried over anhydrous Na_2SO_4 and concentrated under reduced pressure. The residue was chromatographed on a silica gel column with hexane/EtOAc (15/1) as eluent to give **1a** as a white solid (490 mg, 36.4 % overall yield from **7**). M.p. 214-216 °C, $[\alpha]_{\text{D}}^{20}$ -122.6 (c 0.12, CHCl_3). FT-IR (KBr): 3050, 1682, 1619, 1584, 1553, 1480, 1434, 1309, 1264, 1184, 1114, 1091, 1026, 998, 948, 819, 742, 695. ^1H NMR (300 MHz, CDCl_3): δ 8.01 (s, 2H), 7.84-7.94 (m, 6H), 7.70 (s, 4H), 7.45-7.47 (m, 4H), 7.34-7.39 (m, 2H), 7.08-7.20 (m, 40H), 6.84-6.95 (m, 8H). ^{31}P NMR (121 MHz, CDCl_3) δ -14.24, -14.37. ESI-MS: $[M^+ + \text{H}]$, 1319.4; HRMS (ESI): calcd for $\text{C}_{94}\text{H}_{67}\text{P}_4$ $[M^+ + \text{H}]$: 1319.4175. Found: 1319.4188.

Following the same procedures for the preparation of **1a**, ligand **1b** was synthesized in 28 % overall yield from **7** as a white solid. M.p. 120-122 °C. $[\alpha]_{\text{D}}^{20}$ -89.4 (c 0.25, CHCl_3). FT-IR (KBr): 3015, 2918, 2844, 1597, 1581, 1501, 1483, 1455, 1409, 1375, 1305, 1262, 1125, 1036, 948, 891, 846, 818, 743, 692. ^1H NMR (300 MHz, CDCl_3): δ

8.11 (s, 2H), 7.86-7.95 (m, 6H), 7.73 (s, 4H), 7.51-7.57 (m, 4H), 7.38-7.43 (m, 2H), 7.25-7.28 (m, 2H), 6.93-7.06 (m, 6H), 6.74-6.79 (m, 24H), 2.14 (s, 12H), 2.11 (s, 12H), 2.09 (s, 12H), 2.08 (s, 12H). ^{31}P NMR (121 MHz, CDCl_3) δ -13.53, -13.55. ESI-MS: $[M^++H]^+$, 1543.6; HRMS (ESI): calcd for $\text{C}_{110}\text{H}_{99}\text{P}_4$ $[M^++H]^+$: 1543.6705; found: 1543.6692.

a) i. BBr_3 , CH_2Cl_2 , -78°C , ii. $(\text{Boc})_2\text{O}$, CH_3CN , Et_3N
 b) p-xylylene dibromide, K_2CO_3 , DMF
 c) i. CF_3COOH , CH_2Cl_2 , ii. NaOH

Synthesis of bridged DPEN 2:

BBr_3 (1.5 mL, 3 M in CH_2Cl_2 , 1.0 equiv) was added dropwise to a solution of (S,S)-8 (1.2 g, 4.4 mmol) in CH_2Cl_2 (25 mL) at -78°C . The mixture was stirred at room temperature for 48 h, and the reaction was then quenched with water (10 mL). Aqueous ammonia (8 mL) was added to the separated aqueous layer to allow the precipitation of the mono-methoxy protected diamine. The resulting white solid was

collected by suction filtration and dried *in vacuo*. To a suspension of the above solid in CH₃CN (15 mL) and Et₃N (3 mL) was added di-*tert*-butyl dicarbonate ((Boc)₂O, 1.9 g, 8.7 mmol) and the mixture was stirred at room temperature for 30 min. After removal of the solvent, the residue was chromatographed on a silica gel column using hexane/EtOAc (5/1) as elution to give **9** (1.1 g, 55 %) as a white solid. M.p. 136-138 °C. $[\alpha]_D^{20}$ 22.8 (c 0.25, CHCl₃) FT-IR (KBr): 3353, 2977, 2932, 1761, 1685, 1614, 1514, 1456, 1392, 1367, 1248, 1171, 1036, 873, 834, 737. ¹H NMR (300 MHz, CDCl₃) δ 6.84-6.91 (m, 4H), 6.62-6.64 (m, 4H), 5.65 (broad, s, 2H), 4.75 (broad, s, 2H), 3.68 (s, 3H), 1.43 (s, 18H). ¹³C NMR (75 MHz, CDCl₃) δ 158.6, 156.6, 155.8, 131.4, 130.5, 128.5, 128.4, 115.4, 113.7, 79.9, 60.1, 55.1, 28.4. ESI-MS: [*M*⁺+H], 459.2; HRMS (ESI): calcd for C₂₅H₃₄N₂NaO₆ [*M*⁺+Na]: 481.2310; found: 481.2309.

A solution of **9** (900 mg, 1.98 mmol) in DMF (20 mL) containing anhydrous K₂CO₃ (1.0 g) was stirred at room temperature for 0.5 h, and then p-xylylene dibromide (255 mg, 0.96 mmol) was added. The resultant reaction mixture was stirred at 50 °C overnight. After cooling to room temperature, the unreacted K₂CO₃ powder was filtered off and the wet cake was washed with DMF. The combined filtrate was concentrated under the reduced pressure and the residue was recrystallized from CH₂Cl₂/hexane to afford **10** (875 mg, 89 %) as a white solid. M.p. 236-238 °C. $[\alpha]_D^{20}$ 3.8 (c 0.25, CHCl₃). FT-IR (KBr): 3372, 2976, 2934, 2738, 2677, 2492, 1761, 1680, 1613, 1513, 1461, 1367, 1247, 1174, 1036, 831, 737. ¹H NMR (300 MHz, CDCl₃) δ 7.39 (s, 4H), 6.96 (d, *J* = 8.4 Hz, 8H), 6.71 (d, *J* = 8.4 Hz, 4H), 6.77 (d, *J* = 8.7 Hz, 4H), 5.5 (broad, s, 4H), 4.98 (s, 4H), 4.78 (broad, s, 4H), 3.73 (s, 6H), 1.43 (s, 36H). ¹³C NMR (75 MHz, CDCl₃) δ 158.7, 157.8, 156.3, 136.6, 132.2, 131.5, 128.5, 127.6, 114.6, 113.7, 79.9, 69.5, 59.6, 55.1, 28.3.

To a solution of **10** (500 mg, 0.5 mmol) in CH₂Cl₂ (10 mL) was added trifluoroacetic acid (0.6 mL, 7.8 mmol) and the reaction mixture was stirred at room temperature overnight. After removal of the solvent and excess trifluoroacetic acid under the reduced pressure, the residue was treated with 1*N* aqueous NaOH solution and the resulting precipitate was extracted with CH₂Cl₂ (20 mL × 3). The combined organic phase was washed with water and brine, dried over anhydrous Na₂SO₄, and the solvent was removed under reduced pressure to give the crude product, which was recrystallized from CH₂Cl₂/hexane to afford **2** (290 mg, 96 %) as a white solid. M.p. 118-120 °C, $[\alpha]_D^{20}$ -59.7 (c 0.25, CHCl₃). FT-IR (KBr): 3376, 3252, 3169, 2929, 2835, 1610, 1584, 1511, 1460, 1442, 1419, 1374, 1303, 1247, 1177, 1108, 1033, 972, 908, 833, 727, 676, 559. ¹H NMR (300 MHz, CDCl₃) δ 7.43 (s, 4H), 7.15 (d, *J* = 8.7 Hz, 8H), 6.87 (d, *J* = 9.0 Hz, 4H), 6.81 (d, *J* = 8.7 Hz, 4H), 5.04 (s, 4H), 4.01 (s, 4H), 3.78 (s, 6H). ¹³C NMR (75 MHz, CDCl₃) δ 158.4, 157.6, 136.7, 135.8, 135.4, 127.9, 127.8, 127.6, 114.5, 113.5, 69.6, 61.3, 61.2, 55.2. ESI-MS: [*M*⁺+H], 619.5; HRMS (ESI): calcd for C₃₈H₄₃N₄O₄ [*M*⁺+H]: 619.3284; found: 619.3279.

A typical procedure for the preparation of self-supported catalyst.

Ligand **1b** (36 mg, 0.0233 mmol) and [(C₆H₆)RuCl₂]₂ (12 mg, 0.0240 mmol) were dissolved in anhydrous and degassed DMF (2 mL) under argon. The reaction mixture was heated to 100 °C for 2 h and then cooled to 25 °C. Bridged diamine **2** (15 mg, 0.0243 mmol) was added under argon and the reaction mixture was stirred for

additional 24 h at room temperature. After removal of the solvent under vacuum at 50 °C, the residue was washed with degassed 2-propanol for three times to remove the trace amount of soluble low molecular weight species and then dried under vacuum to give a pale brown solid **3b**. ³¹P CP/MAS (161.9 MHz) δ = 54.5; FT-IR (KBr): 3335, 3259, 3022, 2956, 2919, 2859, 1671, 1611, 1582, 1557, 1513, 1462, 1375, 1305, 1252, 1178, 1127, 1016, 947, 851, 808, 736, 701, 565. Anal. calcd (%) for [C₇₄H₇₀Cl₂N₂O₂P₂Ru·3H₂O·3DMF]_n: C, 65.30; H, 6.40; Cl, 4.66; N, 4.59; P, 4.06; Ru, 6.63%. Found: C, 64.38; H, 6.75; Cl, 5.09; N, 4.08; P, 4.61; Ru, 6.22%. PXD spectrum of **3b** was shown in Fig.S1.

[RuCl₂{1b**}{(S,S)-1,2-bis-(4-methoxyphenyl)ethylenediamine}]**: This complex was prepared from ligand **1b** and (S,S)-**8** as a yellow solid according to the procedure mentioned above. [α]_D²⁰ 173.9 (c 0.25, CHCl₃). ¹H NMR (300 MHz, CDCl₃) δ 1.79 (s, 12H), 1.82 (s, 12H), 2.26 (s, 24H), 2.92 (m, 4H), 3.22 (m, 4H), 3.70 (s, 12H), 4.25 (m, 4H), 5.90-8.42 (m, 66H). ³¹P NMR (121 MHz, CDCl₃): δ = 45.28, 45.34. ³¹P CP/MAS (161.9 MHz): δ = 53.9; FT-IR (KBr): 3335, 3258, 3067, 2994, 2922, 2853, 1612, 1583, 1557, 1514, 1463, 1414, 1375, 1305, 1253, 1179, 1129, 1095, 1015, 850, 818, 702.

A typical procedure for heterogeneous asymmetric hydrogenation of ketones using self-supported catalyst **3b and catalyst recycle.**

To a mixture of the Ru complex **3b** (4.6 mg, 3.0 μmol based on Ru) and potassium *tert*-butoxide (6.8 mg, 60 μmol) in a test tube were added acetophenone (0.36 g, 3.0 mmol) and anhydrous 2-propanol (2 mL) under argon. The test tube was placed in a stainless steel autoclave, and autoclave was sealed under N₂ before purging with hydrogen for 6 times. The autoclave was charged with hydrogen (40 atm), and the reaction mixture was stirred at room temperature for 20 h. The remained hydrogen was released and the catalyst was recovered by filtration through cannula under N₂. The solid catalyst was washed with anhydrous degassed 2-propanol and then was recharged with substrate, potassium *tert*-butoxide and isopropanol for next run of the hydrogenation. After removal of solvent from the filtrate under the reduced pressure, the residue was submitted to ¹H NMR analysis to assess the conversion of the starting materials. The enantiomeric excesses of the products were determined by chiral GC.

Fig. S1. PXD pattern of self-supported Ru catalyst **3b**

Figure S2. ^{31}P CP/MAS spectra of (*R*)-xyl-BINAP (**a**), $[\text{RuCl}_2\{(\text{R})\text{-xyl-BINAP}\}\{\text{DMF}\}_n]$ (**b**), $[\text{RuCl}_2\{(\text{R})\text{-xyl-BINAP}\}\{(R,R)\text{-1,2-bis-(4-methoxyphenyl) ethylenediamine}\}]$ (**c**), $[\text{RuCl}_2\{\mathbf{1b}\}\{(R,R)\text{-1,2-bis-(4-methoxyphenyl)ethylenediamine}\}]$ (**d**), assembled polymeric catalyst **3b** (**e**).

Figure S3. FT-IR spectra of ligand **2** (a), [RuCl₂{**1b**}{(*R,R*)-1,2-bis-(4-methoxy-phenyl)ethylenediamine}] (b) and assembled polymeric catalyst **3b** (c).

a

b

C

Figure S4. Chiral GC analysis of products **5a-h**

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	14.547	PB	0.1847	1537.53650	117.46119	50.03564
2	15.427	BB	0.2071	1535.34631	102.30615	49.96436

Totals : 3072.88281 219.76734

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	14.497	PB	0.1673	1104.94043	95.30348	98.72208
2	15.577	PB	0.1454	14.30309	1.58275	1.27792

Totals : 1119.24352 96.88624

It is a method for FID checkout

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	23.552	BV	0.2207	1346.18445	111.64243	50.09963
2	24.291	VB	0.2357	1340.83020	100.44408	49.90037

Totals : 2687.01465 212.08652

It is a method for FID checkout

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	23.184	PP	0.1854	47.34018	4.01856	0.96089
2	23.734	BB	0.2008	4879.34766	354.08307	99.03911

It is a method for FID checkout
FID1 A, (JQ4-890001.D)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	32.225	BV	0.1655	831.01160	77.25286	49.91735
2	32.779	VB	0.1798	833.76331	69.58307	50.08265

Totals : 1664.77490 146.83593

It is a method for FID checkout
FID1 A, (LYXL0000096.D)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	32.096	BV	0.1893	2292.94141	189.33357	97.23061
2	32.761	VB	0.2439	65.30904	4.23625	2.76939

Totals : 2358.25044 193.56983

It is a method for FID checkout

FID1 A, (JQV7-108001.D)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	12.738	PB	0.1250	731.72638	84.55673	49.97701
2	13.689	BB	0.1532	732.39966	70.50622	50.02299

Totals : 1464.12604 155.06295

It is a method for FID checkout

FID1 A, (LYXL0000098.D)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	12.231	BB	0.2281	4545.95215	259.84088	98.09727
2	13.565	BB	0.1543	88.17484	8.99753	1.90273

Totals : 4634.12698 268.83841

It is a method for FID checkout
FID1A, (JQ4-900001.D)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	14.608	VP	0.1663	1657.61768	144.02420	50.61731
2	15.507	BB	0.1931	1617.18652	117.14284	49.38269

Totals : 3274.80420 261.16704

It is a method for FID checkout
FID1A, (LYXL0000099.D)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	14.191	VB	0.2074	4855.85352	286.98318	98.56221
2	15.508	BB	0.1820	70.83527	5.98997	1.43779

Totals : 4926.68879 292.97316

It is a method for FID checkout

FID1 A, (JQU7-107002.D)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	16.327	BB	0.1570	803.89954	80.14079	50.02223
2	17.110	BB	0.1696	803.18488	72.30891	49.97777

Totals : 1607.08441 152.44969

It is a method for FID checkout

FID1 A, (LYXL0000095.D)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	16.020	BB	0.1789	1946.36755	154.62804	98.59445
2	17.032	BB	0.1588	27.74719	2.72383	1.40555

Totals : 1974.11474 157.35186

It is a method for FID checkout
FID1 A, (JQV-103007.D)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	11.660	PV	0.1367	2116.26758	235.73283	49.75717
2	12.284	VB	0.1441	2136.92334	207.63193	50.24283

Totals : 4253.19092 443.36476

It is a method for FID checkout
FID1 A, (LYXL0000103.D)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	11.412	PV	0.1389	3690.46680	374.85229	98.75034
2	12.231	VB	0.1281	46.70200	5.67226	1.24966

Totals : 3737.16880 380.52455

It is a method for FID checkout
FID1 A, (JQ4-840003.D)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	26.920	PV	0.2658	2355.30054	126.16597	50.01785
2	27.926	VB	0.3179	2353.61938	104.83739	49.98215

Totals : 4708.91992 231.00336

It is a method for FID checkout
FID1 A, (LYXL0000102.D)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	26.663	BB	0.2444	1703.70667	97.22670	98.08712
2	27.966	BP	0.2539	33.22542	1.95896	1.91288

Totals : 1736.93209 99.18566