Supporting Information

Enantio- and periselective nitroalkene Diels-Alder reaction

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I. General Information

All reactions were carried out in the oven- or flame-dried glassware under an atmosphere of dry argon unless otherwise noted. Except as otherwise indicated, all reactions were magnetically stirred and monitored by analytical thin-layer chromatography using Merck pre-coated silica gel plates with F_{254} indicator. Visualization was accomplished by UV light (256 nm), with combination of potassium permanganate and/or vanillin solution as an indicator. Flash column chromatography was performed according to the method of Still using silica gel 60 (mesh 230-400) supplied by E. Merck.

Commercial grade reagents and solvents were used without further purification except as indicated below. Dichloromenthane (CH_2Cl_2) was freshly distilled over calcium hydride under an atmosphere of dry argon prior to use. THF was freshly distilled over sodium/benzophenone under an atmosphere of dry argon prior to use. Nitroethylene was prepared according the literature.¹

¹H NMR and ¹³C NMR spectra were recorded on a Bruker Avance 300 (300 MHz ¹H), a Bruker Avance 400 (400 MHz ¹H, 100 MHz ¹³C), and a Bruker Avance 500 (500 MHz ¹H, 125 MHz ¹³C). Chemical shift values (δ) are reported in ppm relative to Me₄Si (δ 0.0 ppm) unless otherwise noted. The proton spectra are reported as follows δ (multiplicity, coupling constant *J*, number of protons). Multiplicities are indicated by s (singlet), d (doublet), t (triplet), q (quartet), p (quintet), h (septet), m (multiplet) and br (broad). Optical rotations were measured on a Rudolph Research Analytical AUTOPOL[®] III automatic polarimeter. Infrared spectra were recorded using PerkinElmerTM SPECTRUM ONE with Universal ATR Sampling Accessory (Composite Zinc Selenide and Diamond crystals). High resolution mass spectra were obtained at Mass Spectrometry Laboratory, Department of Chemistry, University of Miami. Compounds that are not numbered in the manuscript are labeled as **S1**, **S2**, etc.

II. General Procedure for Preparation of 5-Substituted Pentamethylcyclopentadienes 1-Fluoro-4-((1,2,3,4,5-pentamethylcyclopenta-2,4-dienyl)methyl)benzene (S1)



To a solution of NaHMDS (1.10 g, 5.97 mmol) in THF (12 mL) cooled to 0 °C was added a solution of pentamethylcyclopentadiene (813 mg, 5.97 mmol) in THF (6 mL) drop-wise. The resulting mixture was stirred for 1 h at room temperature, cooled back to 0 °C, and then treated with a solution of 4-fluorobenzyl bromide (1.00 g, 5.37 mmol) in THF (6 mL). The reaction mixture was stirred for 20 h at room temperature, quenched with aqueous NH₄Cl solution (20 mL), and extracted with Et₂O (2 x 20 mL). The combined organic layers were washed with brine (1 x 30 mL), dried over MgSO₄, filtered, and

concentrated *in vacuo*, at which time all volatiles, including unreacted pentamethylcyclopentadiene, were removed from the crude reaction mixture. The resulting oil was filtered through a short column of SiO_2 with hexanes, and concentrated *in vacuo* to afford the title compound as a colorless oil (1.22 g, 93%), which was used in the Diels-Alder reaction (*vide infra*) without further purification.

¹H NMR (400 MHz, CDCl₃) δ 6.74 – 6.80 (m, 4H), 2.66 (s, 2H), 1.77 (s, 6H), 1.58 (s, 6H), 0.99 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 161.2 (d, *J* = 250.0 Hz) 138.9, 134.8, 134.2 (d, *J* = 3.0 Hz), 129.7 (d, *J* = 7.8 Hz), 113.6 (d, *J* = 20.6 Hz), 56.5, 40.7, 21.5, 10.7, 10.3; FTIR (neat) υ_{max} 2916, 2854, 1603, 1509, 1447, 1378, 1220, 1157, 1098, 1016, 825, 766 cm⁻¹; GCMS: 244 [M]⁺

1-Chloro-4-((1,2,3,4,5-pentamethylcyclopenta-2,4-dienyl)methyl)benzene (S2)



¹H NMR (400 MHz, CDCl₃) δ 7.03 (d, J = 8.0 Hz, 2H), 6.75 (d, J = 8.0 Hz, 2H), 2.66 (s, 2H), 1.77 (s, 6H), 1.58 (s, 6H), 0.99 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 138.9, 137.1, 134.9, 131.1, 129.8, 127.1, 56.5, 40.8, 21.6, 10.8, 10.3; FTIR (neat) υ_{max} 2917, 2855, 1492, 1445, 1406, 1378, 1265, 1087, 838, 781, 739 cm⁻¹; GCMS: 260 [M]⁺

1-Chloro-3-((1,2,3,4,5-pentamethylcyclopenta-2,4-dienyl)methyl)benzene (S3)



¹H NMR (400 MHz, CDCl₃) δ 6.98 – 7.06 (m, 2H), 6.83 (s, 1H) 6.73 (d, J = 4.0 Hz, 1H), 2.67 (s, 2H), 1.78 (s, 6H), 1.61 (s, 6H), 1.01 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 140.6, 138.9, 135.1, 132.7, 128.5, 128.2, 126.7, 125.6, 56.5, 41.0, 21.6, 10.7, 10.3; FTIR (neat) υ_{max} 2914, 2855, 1597, 1572, 1479, 1445, 1378, 1205, 1078, 859, 772 cm⁻¹; GCMS: 260 [M]⁺

III. Preparation of 2-Amino-1-aza[6]helicenes

All new 11,12-benzo-2-alkylamino-1-aza[6]helicenes were prepared according to the published procedure.²

(+)-(P)-11,12-Benzo-2-(3-ethylpentan-3-amino)-1-aza[6]helicene (2)



 $[\alpha]^{20}{}_{D}$ = +2684, c = 0.0005, CH₂Cl₂. ¹H NMR (400 MHz, CDCl₃) δ 8.19 – 8.26 (m, 3H), 8.04 (d, J = 8.0 Hz, 1H), 7.57 (d, J = 8.0 Hz, 1H), 7.50 (d, J = 8.0 Hz, 1H), 7.26 – 7.38 (m, 6H), 6.85 – 6.89 (m, 2H), 6.32 – 6.36 (m, 1H), 6.08 (d, J = 8.0 Hz, 1H), 0.89 – 1.02 (m, 6H), 0.14 (t, J = 8.0 Hz, 1H) ; ¹³C NMR (100 MHz, CDCl₃) δ 155.0, 145.5, 136.9, 134.0, 133.1, 132.8, 130.63, 130.61, 130.5, 128.4, 127.8, 127.6, 127.1, 127.0, 126.9, 126.6, 126.4, 126.3, 126.2, 125.9, 125.0, 124.4, 124.2, 122.8, 122.79, 121.7, 121.4, 120.6, 107.8, 57.7, 28.0, 7.7; FTIR (neat) υ_{max} 2965, 2927, 1720, 1610, 1520, 1485, 1464, 1360, 1277, 1215, 1131, 837, 747 cm⁻¹; HRMS (ESI-TOF): Exact mass calcd for C₃₆H₃₃N₂ [M + 1]⁺, expected: 493.2644, found: 493.2638

(-)-(*M*)-11,12-Benzo-2-(2-methyl-1-phenylpropan-2-amino)-1-aza[6]helicene (3)



 $[\alpha]^{20}{}_{D} = -2374, c = 0.0005, CH_2Cl_2. {}^{1}H NMR (400 MHz, CDCl_3) \delta 8.67 (dd, J = 4.0, 8.0 Hz, 2H), 8.54 (d, J = 8.0 Hz, 1H), 8.42 (d, J = 8.0 Hz), 8.01 - 8.04 (m, 2H), 7.92 (d, J = 8.0 Hz, 1H), 7.81 (d, J = 8.0 Hz, 1H), 7.63 - 7.76 (m 5H), 7.29 - 7.31 (m, 1H), 7.08 - 7.16 (m, 3H), 6.75 - 6.79 (m, 3H), 6.49 (d, J = 12.0 Hz, 1H), 3.86 (s, 1H), 2.63 (d, J = 12.0 Hz, 1H), 2.37 (d, J = 12.0 Hz, 1H), 0.98 (s, 3H), 0.88 (s, 3H); {}^{13}CNMR(100MHz,CDCl_3) 155.1, 145.6, 137.9, 136.5, 133.9, 132.9, 132.8, 130.7, 130.51, 130.46, 14 0.44, 128.5, 128.2, 127.7, 127.6, 127.4, 127.0, 126.9, 126.7, 126.5, 126.4, 126.3, 126.0, 125.8, 125.1, 124. 6, 124.2, 122.8, 122.7, 122.1, 121.5, 120.7, 109.6, 53.1, 46.4, 28.1, 27.0; FTIR (neat) <math>\upsilon_{max}$ 2972, 1610, 1520, 1484, 1263, 839, 732, 700 cm⁻¹; HRMS (ESI-TOF): Exact mass calcd for $C_{39}H_{31}N_2$ [M + 1]⁺, expected: 527.2487, found: 527.2482

(-)-(M)-11,12-Benzo-2-(3-phenethyl-1,5-diphenylpentan-3-amino)-1-aza[6]helicene (4)



 $[\alpha]^{20}_{D} = -1780, c = 0.0005, CH_2Cl_2.$ ¹H NMR (400 MHz, CDCl_3) δ 8.13 – 8.17 (m, 2H), 7.94 (d, J = 8.0 Hz, 1H), 7.88 (d, J = 8.0 Hz, 1H), 7.53 – 7.20 (m, 9H), 6.53 – 6.97 (m, 15H), 6.27 – 6.29 (m, 2H) 6.11 (d, J = 8.0 Hz, 1H), 1.78 – 1.98 (m, 6H), 1.23 – 1.37 (m, 6H); ¹³C NMR (100MHz, CDCl_3) 154.4, 145.5, 142.0, 137.3, 134.1, 132.9, 130.7, 130.5, 130.4, 130.1, 128.6, 128.4, 128.3, 127.7, 1 27.2, 127.1, 127.0, 126.99, 126.8, 126.5, 126.43, 126.39, 126.1, 125.85, 125.3, 124.3 122.9, 122.8, 122.3, 121.6, 120.9, 107.6, 57.2, 38.8, 30.0 (two signals overlap to give one); FTIR (neat) υ_{max} 2932, 1608, 1519, 1454, 1379, 1264, 841, 733, 699 cm⁻¹; HRMS (ESI-TOF): Exact mass calcd for C₅₄H₄₅N₂ [M + 1]⁺, expected: 721.3583, found: 721.3577

(-)-(*M*)-11,12-Benzo-2-(5-butylnonan-5-amino)-1-aza[6]helicene (5)



 $[\alpha]^{20}{}_{D}$ = - 2082, c = 0.0005, CH₂Cl₂. ¹H NMR (400 MHz, CDCl₃) & 8.61 - 8.67 (m, 3H), 8.44 (d, *J* = 8.0 Hz, 1H), 7.66 - 8.01 (m, 7H), 7.26 - 7.32 (m, 3H), 6.74 - 6.77 (m, 1H), 6.49 (d, *J* = 12.0 Hz, 1H), 0.77 - 1.35(m,27H);¹³CNMR(100MHz,CDCl₃) 154.8, 145.4, 136.8, 134.0, 133.4, 132.8, 130.8, 130.6, 130.5, 12 8.3, 127.7, 127.5, 127.13, 127.1, 126.9, 126.6, 126.43 126.36, 126.3, 126.0, 125.1, 124.4, 124.3, 122.8, 12 2.7, 121.6, 121.3, 120.6, 107.4, 56.9, 36.6, 25.2, 23.0, 13.9; FTIR (neat) ν_{max} 3400, 2930, 2861, 1609, 1584, 1519, 1485, 1465, 1356, 1263, 1144, 837, 751, 723 cm⁻¹; HRMS (ESI-TOF): Exact mass calcd for C₄₂H₄₅N₂ [M + 1]⁺, expected: 577.3583, found: 577.3577

IV. General Procedure for Asymmetric Nitroalkene Diels-Alder Reaction



To a solution of **5** (72 mg, 0.12 mmol) in CH_2Cl_2 (2.4 mL) was added Et_2O solution of HCl (1M, 0.14 mL) drop-wise at room temperature. The reaction mixture was stirred for 30 min. and then concentrated *in vacuo*. The resulting solid was redissolved in CH_2Cl_2 (2.0 mL), and then concentrated *in vacuo*, the process of which was repeated three times. To the resulting yellow solid were added CH_2Cl_2 (2.6 mL), and NaBArF₂₄·2.6H₂O (109 mg, 0.12 mmol) at room temperature. The resulting mixture was stirred for 30 min., filtered through a short pad of Celite, concentrated *in vacuo*, and then used in the Diels-Alder reaction without purification.

(-)-7-Benzyl-1,2,3,4,7-pentamethyl-5-nitrobicyclo[2.2.1]hept-2-ene (S4)



A flame-dried test tube was charged with (*P*)-catalyst (28 mg, 0.02 mmol) and 4 Å molecular sieves (28 mg). To this were added CH₂Cl₂ (0.3 mL) and a solution of nitroethylene (15 mg, 0.2 mmol) in CH₂Cl₂ (0.1 mL). The resulting mixture was cooled to -78 °C, slowly treated with a solution of diene³ (91 mg, 0.4 mmol) in CH₂Cl₂ (0.3 mL), stirred at -78 °C for 20 h, and then quenched with a solution of hydrazine hydrate (0.1 mL) in MeOH (0.1 mL). The resulting mixture was washed with H₂O (3 x 1 mL) and brine (1 x 1 mL), dried over Na₂SO₄, filtered, and concentrated *in vacuo*. The crude material was purified by flash chromatography on silica gel (20% benzene in hexanes) to afford the title compound as colorless oil (46 mg, 77%) with 70:30 er. The ligand **5** was recovered by eluting the column with 100% EtOAc (67 mg, 93%), and reused without loss in activity and selectivity.

Enantiomeric ratio was determined by HPLC with a Chiralcel OD-H column equipped with an OD-H guard column (100% Hexanes, flow rate = 0.5mL/min), t_r (major) = 40.72 min., t_r (minor) = 46.79 min. [α]²⁰_D = -40, c = 0.0005, CH₂Cl₂. ¹H NMR (400 MHz, CDCl₃) δ 7.17 – 7.29 (m, 4H), 7.05 – 7.07 (m, 1H), 4.69 – 4.71 (m, 1H), 2.58 (d, *J* = 12.0 Hz, 1H), 2.49 (d, *J* = 12.0 Hz, 1H), 1.87 – 1.89 (m, 2H), 1.69 (s, 3H), 1.48 (s, 3H), 1.12 (s, 3H), 0.89 (s, 3H), 0.77 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 139.3, 139.1, 131.2, 130.6, 127.8, 125.9, 91.6, 64.0, 63.6, 55.0, 39.2, 37.5, 15.4, 12.4, 11.2, 10.7, 10.1; FTIR (neat) υ_{max}

2943, 1541, 1448, 1382, 1362, 908, 729 cm⁻¹; HRMS (ESI-TOF): Exact mass calcd for $C_{19}H_{26}NO_2$ [M + 1]⁺, expected: 300.1964, found: 300.1958.

(+)-7-(4-Fluorobenzyl)-1,2,3,4,7-pentamethyl-5-nitrobicyclo[2.2.1]hept-2-ene (85)



(*M*)-catalyst was used. Enantiomeric ratio was determined by HPLC with a Chiralcel OD-H column equipped with an OD-H guard column (100% Hexanes, flow rate = 0.5mL/min), t_r (minor) = 35.07 min., t_r (major) = 40.37 min. [α]²⁰_D = +32, c = 0.0005, CH₂Cl₂. ¹H NMR (400 MHz, CDCl₃) δ 6.99 – 7.02 (m, 2H), 6.89 – 6.94 (m, 2H), 4.70 (dd, *J* = 5.2, 6.4 Hz, 1H), 2.57 (d, *J* = 12.0 Hz, 1H), 2.45 (d, *J* = 12.0 Hz, 1H), 1.88 – 1.90 (m, 2H), 1.69 (s, 3H), 1.47 (s, 3H), 1.12 (s, 3H), 0.87 (s, 3H), 0.77 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 161.4 (d, *J* = 243.0 Hz), 139.0, 134.95 (d, *J* = 3.6 Hz), 131.8 (d, *J* = 7.9 Hz), 131.2, 114.6 (d, *J* = 20.6 Hz), 91.5, 63.49, 63.47, 56.0, 38.3, 37.5, 15.3, 12.4, 11.2, 10.7, 10.1;FTIR (neat) ν_{max} 2944, 1541, 1508, 1448, 1383, 1222, 908, 828, 729 cm⁻¹; HRMS (ESI-TOF): Exact mass calcd for C₁₉H₂₅FNO₂ [M + 1]⁺, expected: 318.1869, found: 318.1864.

(+)-7-(4-Chlorobenzyl)-1,2,3,4,7-pentamethyl-5-nitrobicyclo[2.2.1]hept-2-ene (S6)



(*M*)-catalyst was used. Enantiomeric ratio was determined by HPLC with a Chiralcel OD-H column equipped with an OD-H guard column (100% Hexanes, flow rate = 0.5mL/min), t_r (minor) = 44.85 min., t_r (major) = 55.91 min. [α]²⁰_D = +40, c = 0.0005, CH₂Cl₂. ¹H NMR (400 MHz, CDCl₃) δ 7.19 – 7.21 (m, 2H), 6.98 – 7.01 (m, 2H), 4.70 (dd, *J* = 5.2, 6.4 Hz, 1H), 2.57 (d, *J* = 12.0 Hz, 1H), 2.46 (d, *J* = 12.0 Hz, 1H), 1.89 – 1.91 (m, 2H), 1.69 (s, 3H), 1.48 (s, 3H), 1.14 (s, 3H), 0.87 (s, 3H), 0.79 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 139.0, 137.9, 131.82, 131.8, 131.3, 127.9, 91.4, 64.0, 63.5, 56.0, 38.5, 37.4 15.4, 12.4, 11.2, 10.8, 10.1 FTIR (neat) υ_{max} 2942, 1540, 1490, 1447, 1382, 1362, 1091, 1015, 810, 732 cm⁻¹; HRMS (ESI-TOF): Exact mass calcd for C₁₉H₂₅ClNO₂ [M + 1]⁺, expected: 334.1574, found: 334.1568.

(+)-7-(3-Chlorobenzyl)-1,2,3,4,7-pentamethyl-5-nitrobicyclo[2.2.1]hept-2-ene (S7)



(*M*)-catalyst was used. Enantiomeric ratio was determined by HPLC with a Chiralcel OD-H column equipped with an OD-H guard column (100% Hexanes, flow rate = 0.5mL/min), t_r (minor) = 57.59 min., t_r (major) = 65.56 min. [α]²⁰_D = +28, c = 0.0005, CH₂Cl₂. ¹H NMR (400 MHz, CDCl₃) δ 7.19 – 7.21 (m, 2H), 6.98 – 7.01 (m, 2H), 4.70 (dd, *J* = 5.2, 6.4 Hz, 1H), 2.57 (d, *J* = 12.0 Hz, 1H), 2.46 (d, *J* = 12.0 Hz, 1H), 1.89 – 1.91 (m, 2H), 1.69 (s, 3H), 1.48 (s, 3H), 1.14 (s, 3H), 0.87 (s, 3H), 0.79 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 141.5, 139.1, 133.6, 131.3, 130.5, 129.0, 128.7, 126.1, 91.4, 63.9, 63.6, 56.0, 39.0, 37.4, 15.5, 12.4, 11.2 , 10.7, 10.1 FTIR (neat) ν_{max} 2940, 1596, 1540, 1443, 1382, 1362, 1322, 875, 785 cm⁻¹; HRMS (ESI-TOF): Exact mass calcd for C₁₉H₂₅CINO₂ [M + 1]⁺, expected: 334.1574, found: 334.1587

V. Assignment of Absolute Stereochemistry

Absolute configuration of (+)-7-(4-chlorobenzyl)-1,2,3,4,7-pentamethyl-5-nitrobicyclo-[2.2.1]hept-2-ene (**S6**) was assigned on the basis of the X-ray structure of enantiopure **S6** prepared by HPLC (Chiralcel OD-H column, 100% Hexanes, flow rate = 0.5mL/min, t_r of (-)-enantiomer = 44.85 min., t_r of (+)-enantiomer = 55.91 min.) as described below. Those of other products (**S4**, **S5** and **S6**) were assigned by analogy.



Figure S1. An ORTEP of the molecular structure of (+)-enantiomer of S6 showing 50 % thermal ellipsoid probability.



Figure S2. An ORTEP of the molecular structure of (-)-enantiomer of S6 showing 50 % thermal ellipsoid probability.

Stereochemical Models:

Schemes S1 and S2 depict the proposed stereochemical models of the Diels-Alder reaction, and Scheme S3 depicts that of the conjugate addition reaction previously reported by us.² These models are based on the sense of enantioselection observed in those reactions and the X-ray structure of catalyst (*P*)-1.² The backside of the bound nitroalkene is completely screened by the bottom half of the helicene framework. In the disfavored transition state, R group, which is designed to extend the top half of the helical framework, effectively hinders the approach of an incoming reactant (CP or pyrrole).



Scheme S1. Two *endo* TS models with (*M*)-catalyst. Non-substituted CP is shown for clarity. $^{-}BArF_{24} = tetrakis[3,5-bis(trifluoromethyl)phenyl]borate.$



Scheme S2. Two *endo* TS models with (*P*)-catalyst. Non-substituted CP is shown for clarity. $_BArF_{24} = tetrakis[3,5-bis(trifluoromethyl)phenyl]borate.$



Scheme S3. Two synclinal TS models for the conjugate addition reaction.² $^{-}BArF_{24} = tetrakis[3,5-bis(trifluoromethyl)phenyl]borate.$

Crystallographic Analyses:

The data crystals of (+)-enantiomer and (-)-enantiomer were mounted onto the end of a thin glass fiber using Paratone-N. X-ray intensity data were measured with a Bruker SMART APEX2 CCD-based diffractometer using Mo K α radiation ($\lambda = 0.71073$ Å).¹ The raw data frames were integrated with the SAINT+ program by using a narrow-frame integration algorithm.¹ Corrections for Lorentz and polarization effects were also applied with SAINT+. An empirical absorption correction based on the multiple measurement of equivalent reflections was applied using the program SADABS. The structure was solved by a combination of direct methods and difference Fourier syntheses, and refined by full-matrix least-squares on F², by using the SHELXTL software package.² All non-hydrogen atoms were refined with anisotropic displacement parameters unless otherwise stated. Hydrogen atoms were placed in geometrically idealized positions and included as standard riding atoms during the least-squares refinements. Crystal data, data collection parameters, and results of the analyses are listed in Table S1.

Colorless single crystals of (+)-enantiomer suitable for x-ray diffraction analyses obtained by evaporation of ethanol/water solvent mixture crystallized in the Triclinic crystal system. The structure could only be solved in the chiral space group P1. Attempts to solve the structure in the centrosymmetrical space group P $\overline{1}$ were unsuccessful. Furthermore, ADDSYM/PLATON³ test did not indicate any additional missed symmetry. The Flack x(u) parameter 0.04(3) indicates that the correct

enantiomorph has been selected. With Z = 4, there are four formula equivalents of the complex present in the asymmetric crystal unit. All four molecules are the same enantiomer.

Colorless single crystals of (-)-enantiomer suitable for x-ray diffraction analyses obtained by evaporation of isopropanol/water solvent mixture crystallized in the Triclinic crystal system. The structure could only be solved in the chiral space group P1. Attempts to solve the structure in the centrosymmetrical space group P $\overline{1}$ were unsuccessful. Furthermore, ADDSYM/PLATON³ test did not indicate any additional missed symmetry. The Flack x(u) parameter – 0.03(3) indicates that the correct enantiomorph has been selected. With Z = 4, there are four formula equivalents of the complex present in the asymmetric crystal unit. All four molecules are the same enantiomer.

	(+)-enantiomer	(-)-enantiomer	
Empirical formula	$C_{19}H_{24}NO_2Cl$	C ₁₉ H ₂₄ NO ₂ Cl	
Formula weight	333.84	333.84	
Crystal system	Triclinic	Triclinic	
Lattice parameters			
<i>a</i> (Å)	8.3213(4)	8.3206(4)	
<i>b</i> (Å)	8.3312(4)	8.3369(4)	
<i>c</i> (Å)	25.7701(13)	25.7561(14)	
α (°)	93.369(1)	93.355(1)	
β(°)	95.301(1)	95.323(1)	
γ (°)	93.703(1)	93.682(1)	
V (Å ³)	1771.42(15)	1771.53(15)	
Space group	P1 (#1)	P1 (#1)	
Z value	4	4	
ρ_{calc} (g / cm ³)	1.252	1.252	
μ (Mo K α) (mm ⁻¹)	0.225	0.225	
Temperature (K)	100	100	

 Table S1. Crystallographic Data for (+)-enantiomer and (-)-enantiomer.

$2\Theta_{\max}$ (°)	54.0	54.0
No. Obs. ($I \ge 2\sigma(I)$)	12509	12543
No. Parameters	849	849
Goodness of fit	1.023	1.036
Max. shift in cycle	0.002	0.001
Residuals*:R1; wR2	0.0446; 0.0827	0.0453; 0.0873
Absorption Correction,	Multi-scan	Multi-scan
Max/min	0.9933/0.9194	0.9866/0.9154
Absolute structure Flack parameter	0.04(3)	- 0.03(3)
Largest peak in Final Diff. Map $(e^2/\text{\AA}^3)$	0.228	0.302

 $*R = \Sigma_{hkl} (\mid \mid F_{obs} \mid - \mid F_{calc} \mid \mid) / \Sigma_{hkl} \mid F_{obs} \mid ; R_w = [\Sigma_{hkl} w (\mid F_{obs} \mid - \mid F_{calc} \mid)^2 / \Sigma_{hkl} w F_{obs}^2]^{1/2},$

 $w = 1/\sigma^{2}(F_{obs}); \text{ GOF} = [\Sigma_{hkl}w(\mid F_{obs} \mid - \mid F_{calc} \mid)^{2}/(n_{data} - n_{vari})]^{1/2}.$

References for X-ray analyses:

Apex2 Version 2.2-0 and SAINT+ Version 7.46A; Bruker Analytical X-ray System, Inc., Madison, Wisconsin, USA, 2007.

(a) G. M. Sheldrick, SHELXTL Version 6.1; Bruker Analytical X-ray Systems, Inc., Madison, Wisconsin, USA, 2000. (b) G. M. Sheldrick, *Acta Cryst.* 2008, A64, 112–122.

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	ers HAz sec K K Ssec	usec dB MHz	Hz Hz	ст ст Ррт Нz Нz Hz/ст Hz/ст
Data Parameters 14 NMR 1	uisition Paramet 20120220 11.31 spect 5 mm PABB0 BB- 2930 65535 CDC13 8 8 8 8 8 2930 65535 CDC13 8 8 8 8 8 8 8 8 2930 055634 3 3.5584243 3.5584243 3.5584243 3.5584242 3.5564242 3.5564242 3.55642642 1.00000000 6.000 6.000	CHANNEL f1 ==== 1H 10.50 399.9954701	cessing paramete 32768 399.9930047 EM 0 0.30 0.30	<pre>> 10t parameters 20.00 5.00 10.000 3999.93 -0.500 -200.00 0.52500 209.39634</pre>
Current VAME EXPNO PROCNO	22 - Acq Time Itime PADBHD PADBHD PADBHD SGLVENT SSWH FIDRES SSWH FIDRES AdG DM DM DF DM DF DM DF DF DM DF DF DF DF DF DF DF DF DF DF DF DF DF	NUC1 NUC1 P1 PL1 SF01	F2 - Prc SI WDW SSB SSB GB GB GB FC	1D NMR F CCX CCY F1P F1 F2 F2 PPMCM HZCM



	Hz	sec k k sec sec sec	usec dB MHz	usec dB dB dB MHz	ers MHz Hz	cm cm cm ppm Hz ppm/cm Hz/cm
Data Parameters 1H NMR 1	uisition Paramet 20120220 21.42 spect 5 mm PABB0 BB- 200330 65536 65536 05536 50013 5013 2080.814 0.365918	1.3664756 71.8 20.850 6.00 6.00 300.0 2.0000000 0.03000000 0.03000000 0.03000000	CHANNEL f1 ==== 13C 9.80 -2.00 100.5883377	CHANNEL f2 ==== waltz16 H1 80.00 -2.00 17.23 17.89 399.9946000	cessing paramete 32768 100.5783215 EM 1.00 1.40	lot parameters 20.00 2.00 200.000 20115.66 -0.500 -50.29 10.02500 1008.29767
Current NAME EXPNO PROCNO	F2 - Acq Date_ Time INSTRUM PROBHD PULPROG PULPROG SOLVENT NS SOLVENT NS SSUVENT SSUVENT	AQ BG DF DF 11 d12 d12	PL 1 SF01	======================================	F2 - Prc S1 S5 MDW S5B CB PC	10 NMR P CX CY F1P F2P F2P F2P F2P F2P F2P F2P F2P

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75

100

125

150

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bpm



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	S C U	Hz Hz sec usec K Sec sec	usec dB MHz	ers MHz Hz	cm cm ppm Hz ppm Hz Hz/cm
Data Parameters 1H NMR 1	quisition Paramet 20120220 11.14 5 mm PABBO BB- 2930 65536 65136 13	B278.145 0.126314 3.9584243 3.9584243 60.400 6.00 1.00000000	= CHANNEL f1 ==== 1H 10.50 0.00 399.9954701	ocessing paramete 32768 399.9930047 EM 0.30 0.30 0.30	plot parameters 20.00 3.00 10.000 3999.93 -0.500 -200.00 209.99634
Jrrent AME XPNO ROCNO	2 - Ac ate NSTRUM NST		JC1 1 -1 -1 -01		ZCM



	о U	Hz Hz sec usec k sec sec sec	usec dB MHz	usec dB dB MHz	ers MHz Hz	cm cm ppm Hz ppm/c hz/cn
Current Data Parameters NAME 13C NMR EXPNO 2 PPOCNO 2	F2 - Acquisition Paramet Date20120220 11me 19.16 INSTRUM spect PADBHD 5 mm PABB0 BB- PULPRDG 5535 SOLVENT CDC13 NS 692	US 23980.814 SWH 23980.814 FIDRES 0.365918 AG 1.3664756 DM 20.456 DM 20.857 71.8 0.0000000 DE 6.00 TE 2.0000000 d11 0.03000000 d12 0.00002000	====== CHANNEL f1 ==== NUC1 13C P1 9.80 P1 -2.00 PL1 100.5883377	====== CHANNEL f2 ==== CPDPRG2 waltz16 NUC2 N1 PCPD2 80.00 PL2 -2.00 PL12 15.23 PL13 17.89 PL13 399.9946000 SF02 399.9946000	F2 - Processing paramete SI 32768 SF 100.5783208 WDW EM SSB 1.00 CB 1.00 68 1.40	10 NMR plot parameters CX 20.00 CY 2.00 F1P 20115.66 F2P -0.500 F2 -0.500



bpm

E



	ດ ບ	Hz Hz sec usec K sec	usec dB MHz	MHz Hz	ст ст ррт Нz Hz Hz/ст Hz/ст
Data Parameters 1H NMR 1	uisition Paramet 20120220 20.16 spect 5 mm PABB0 BB- 2930 65536 COC13 8	8278.146 0.126314 3.9584243 71.8 60.400 60.400 6.00 1.00000000	CHANNEL f1 ==== 1H 10.50 399.9954701	cessing paramete 32768 399.9930055 EM 0.30 0.30	olot parameters 20.00 3.00 10.000 3999.93 -0.500 -200.00 0.52500 209.99634
Current NAME EXPNO PROCNO	F2 - Acq Date_ Time INSTRUM PROBHD PULPROG TD SOLVENT NS DS	SWH F I DRES AQ DW DE TE D1 D1	NUC1 NUC1 P1 PL1 SF01	F2 - Prc SI WDW SSB SSB LB CB FC	1D NMR F CX CY F1P F1 F1 F2P PPMCM HZCM



S19

ie ters SC NMR 2	arameters 20.22 20.22 spect 30 BB- 30 BB- 65536 65536 65536 65536 5536 56756 564756 564756 564756 564756 564756 50 usec 6.00 usec 6.00 usec 6.00 usec 000000 sec 000000 sec	f1 ======== 9.80 usec -2.00 dB 883377 MHz f2 ======= altz16 1H 80.00 usec -2.00 dB 17.89 dB 17.89 dB 17.89 dB	arameters 32768 MHz EM 1.00 Hz 0 1.40 Hz 0 1.40 m 2.00 cm 2.00 cm 2.00 cm 2.00 pp 0115.66 Hz -0.500 pp 0115.66 Hz -0.500 pp 0,000 pp 0,29767 Hz/cr
urrent Data Parar AME 11 XPNO BOCNO	2 - Acquisition f ate20 ime NSTRUM NSTRUM NSTRUM NNPABI D DLVENT S S S S S S S S S S S S S S S S S S S		22 - Processing F 35 40W 40W 55B 28 33B 28 33B 28 33B 28 33B 28 33B 28 33B 28 33B 28 52P 71P 72P 72P 72P 72P 72P 72P 72P 72



bpm



13C	S L	Hz Hz sec usec k K sec	usec dB MHz	HZ HZ	см см Н2 Ррм Н2 Н2/см/с
Data Parameters tri-Et-Helicene 1	Juisition Paramet 20120223 22.43 5 mm PABBO BB- 230 65536 65536 65536 65536 65536 65536	8278.146 0.126314 3.9584243 60.400 60.400 6.00 1.0000000	 CHANNEL f1 ==== 14 10.50 0.00 399.9954701 	acessing paramete 32768 32768 399.9931687 0 0.30 0.30 1.00	alot parameters 20.00 3.00 10.000 3909.93 999.93 -200.500 0.52500 0.52500
Current NAME EXPNO PROCNO	F2 - Acc Date_ Time INSTRUM PROBHD PULPROG PULPROG SOLVENT SOLVENT	SWH F IDRES AQ DW DD TE D1 D1	PL 1 SF01	F2 - Pr SI SF SF WDW SSB LB CB PC	11D NMR 1 CCX CCY F1P F2P F2P F2P PPMCM HZCM



: Data Parameters tri-Et-Helicene 13C 1	:quisition Parameters 23.02 23.02 23.02 23.02 23.02 23.02 23.02 23.02 23.02 23.02 23.02 20.930 10304 4 23980.814 Hz 0.365918 Hz 10304 Hz 0.365918 Hz 1.3664756 scc 50.0 usec 6.00 usec 300.0 K 20.0000000 scc 0.000020000 scc	== CHANNEL f1 ======== 13C 9.00 usec -2.00 dB 100.5883377 MHz	== CHANNEL f2 ======== 11 80.00 usec -2.00 dB 15.23 dB 15.23 dB 15.23 dB	ocessing parameters 32768 100.5783223 MHz EM 1.00 Hz 0 1.40	plot parameters 20.00 cm 6.00 cm 200.000 ppm 20115.66 Hz -0.500 ppm -50.29 Hz 10.02500 ppm/r 1008.29767 Hz/cm
Current NAME EXPNO PROCNO	52 - Ad Date - Time PROBHD PPU PPOC PPU PPOC PPU PPOC PPU PPOC PPOC SWH SSC VEN SSC VE	====== NUC1 P1 PL1 SF01	======= CPDPRG2 NUC2 PCPD2 PCD2 PL12 PL13 SF02 SF02	SI - Pr SI - Pr NDW SSB SSB SSB SSB SSB SSB SSB SSB SSB SS	1D NMH CX CY F1P F1 F2 F2P F2P F2P F2P F2P F2CM

175

ppm



2 NMF	ers H	Hz sec usec K sec	usec dB MHz	MH Z HZ	ст Ст Ррт Н2 Ррт Н2/Ст Н2/Ст
ata Parameters 13C of helicene 1	isition Paramet 20120222 22.17 5 mm PABB0 BB- 2936 55536 65536 65536 65536 65536 65538 16	0.126314 3.9584243 143.7 60.400 6.00 6.00 6.00 1.0000000	CHANNEL f1 ==== 1H 10.50 0.00 399.9954701	essing paramete 32768 399.9931871 EM 0.30 0.30 0.30 1.00	ot parameters 20.00 3.00 10.000 3999.93 -0.500 -200.00 0.52500 0.52500
Current D NAME EXPNO PROCNO	72 - Acqu Date_ Time INSTRUM PROBHD PULPROG PULPROG SOLVENT SOLVENT SMH	F I DRES AG DW DE TE D1	NUC1 P1 PL1 SF01	FZ - Proc SI SF WDW SSB SSB CB GB PC	10 NMR P1 CX CY F1 F1 F2 PPMCM H2CM



3

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2 NMI	.ers Hz Hz Sec usec sec sec sec	usec dB MH2 usec dB dB dB MH2	Rrs MHZ HZ Cm Cm Cm Cm HZ HZ/Cm
ent Data Parameters 13C of helicene 0 1 NO 1	Acquisition Parameti - 20100222 RUM 201080 RUM 5 mm PAB0 BB- ROG 55536 ENT 20030 85536 COI 3 1.3664756 28.5 20.850 6.00 6.00 6.00 0.03000000 0.03000000 0.00002000	==== CHANNEL f1 ==== 13C 9.80 9.80 100.5683377 100.5683377 100.5683377 100.5683377 100.5683377 110.22 80.00 15.23 15.23 15.23 15.23	Processing parameter 32768 100.5783223 EM 0 1.40 1.40 1.40 0 0 1.40 20.00 20.00 20.00 20.00 20.00 -10.000 -10.000 1.056.07239
CULL NAME EXPN PROC	F2 - 52 - 52 - 52 - 52 - 52 - 52 - 52 -	PL1 PL1 SF01 PL1 PL2 PL2 PL2 PL2 PL2 PL2 PL2 PL2 SF02 SF02	SSI SSI SSI SSI SSI SSI SSI SSI SSI SSI





S24

130	ers Hz	sec usec sec	usec dB MHz	MHz Hz	cm cm ppm hz hz hz/cm hz/cm
Data Parameters tri-ph-helicene 1	uusition Paramet 20100225 2.28 5 mm PABBO BB- 2930 65536 65536 65536 65536 65536 65536 8278.146 8278.146 0.126314	3.9584243 143.7 60.400 6.00 6.00 1.00000000 1.0000000	10.50 0.00 399.9954701	acessing paramete 32768 399.9931965 665 0 0 0.30 0.30 1.00	plot parameters 20.00 1.00 3599.94 0.000 0.000 0.000 179.99693
Current NAME EXPNO PROCNO	F2 - Acc Date INSTRUM PROBHD PULPROG PULPROG TD SOLVENT NS SOLVENT NS SWH SWH FIDRES	AQ DG Df Df D1 1 1	NUC1 P1 PL1 SF01	FF2 - Pr. SSI WDW SSB SSB GB GB PC	1D NMR CX CY F1 F1 F2 F2 F2 PPMCM HZCM





S25

sta Parameters :rı-ph-helicene 13C 1	Isition Parameters 20120225 2.53 2.53 2.53 2.53 2.53 2.53 2.59930 65536 65548 4 2.29930.814 Hz 0.365918 Hz 0.365918 Hz 0.365918 Hz 0.365918 Hz 0.365918 Hz 0.365918 Hz 0.365918 Hz 0.0000000 sec 0.0000000 sec 0.0000000 sec	CHANNEL f1 ======= 13C 9.80 usec -2.00 dB 100.5B83377 MHz 100.5B83377 MHz Hz 11 11 11 12 15 23 dB 15.23 dB 15.23 dB 15.23 dB 15.23 dB 15.23 dB 15.23 dB 15.20 dB 100 cB 100	essing parameters 32768 100.5783230 MHz 0 0 0 0 1.40	ot parameters 20.00 cm 4.00 cm 200.000 ppm 20115.66 Hz -10.000 ppm -1005.78 Hz 10.50000 ppm/c1 1056.07239 Hz/cm
Current D. NAME EXPNO PROCNO	F2 - Acqu Date - Time - Time - PHOBHD PULPROG TD PULPROG TD PULPROG TD PULPROG FIDRES SOLVENT NS SOLVENT NS SOLVENT NS SOLVENT OS COLVENTO COLVENTO	======================================	F2 - Proc SI SF MDW SSB CB CB	10 NMR P1 CX CY F1P F1 F2P F2P F2MCM H2CM





Current Data Parameters NAME New 1H NMR EXPNO 1 PROCNO 1	F2 - Acquisition Parameters Date _ 20120221 Time 21.00 INSTRUM spect PR0BHD 5 mm PABB0 BB- PULPROG 65536 SOLVENT 00123 NS 8 SOLVENT 0.126314 Hz AQ 3.9584243 sec RG 3.9584243 sec DW 60.400 usec DW 60.0 usec DE 60.0 usec TE 300.0 K	======= CHANNEL f1 ======== NUC1 1H P1 10.50 usec PL1 399.9954701 MHz SF01 399.9954701 MHz F2 - Processing parameters ST 399.9930050 MHz MDW EM SSB 0.120 Hz MDM 0.30 Hz BB 0.30 Hz BB 0.30 Hz	10 NMR plot parameters CX 20.00 cm CY 20.00 ppm F1P 10.000 ppm F1 3999.93 HZ F2P -0.500 ppm/cm F2 0.52500 ppm/cm HZCM 209.99634 Hz/cm





S27

Current Data Parameters NAME 13C NMR EXPNO 2 PROCNO 2	F2 - Acquisition Parameters Date20120221 Time21.14 INSTRUM spect PADBHD 5 mm PABB0 BB- PULPROG 299330 TO 65535	SILVENT 020 NS 12131 DS 12131 SWH 23980.814 Hz FIDRES 0.365918 Hz AQ 1.3664756 sec RG 71.8 DW 20.850 usec	DE 6.00 usec TE 300.0 K D1 2.0000000 sec d11 0.0300000 sec d12 0.00002000 sec	======= CHANNEL f1 ======== NUC1 13C P1 9.80 Usec PL1 -2.00 dB PL1 100.5BB3377 MHz	======= CHANNEL f2 ======== CPDPRG2 waltz16 NUC2 1H PCPD2 80.00 usec PL2 -2.00 dB PL12 15.23 dB PL13 17.89 dB PL13 399.9946000 MHz	F2 - Processing parameters SI 32768 SF 100.5783208 WDW n0 SSB 0 LB 0.00 LB 0.00 CB 0 PC 1.40	10 NMR plot parameters CX 20.00 cm CY 10.00 cm F1P 200.000 ppm F1 20115.66 Hz F2P -10.000 ppm F2P -10.000 ppm F2P -1005.78 Hz PPMCM 10.5000 ppm/c HZCM 1056.0733 Hz/cm
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S28





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Data Parameters New 1H NMR 1	quisition Paramet 20120222 10.09 5 mm PABBO BB- 2930 65536 COC13 8	2 8278.146 0.126314 3.9584243 556 60.400 6.00 6.00 1.0000000	= CHANNEL f1 ==== 1H 10.50 0.00 399.9954701	ocessing paramete 32768 399.9930050 EM 0.30 0.30	plot parameters 20.00 6.00 10.000 3999.93 -0.500 -200.00 209.99634
urrent IAME XPNO ROCNO	2 - Ac Jate ime NSTRUM PROBHD PULPROG D CD SOLVENT 45	00 10 10 10 10 10 10 10 10 10 10 10 10 1		- Pr BB MDW SSB CB CB CB CB	1D NMR CCY F1P F1 F2P F2P F2P F2CM H2CM

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	S L Z	, , , , , , , , , , , , , , , , , , ,	=== B Hz	=== BB HZ	s II Z	m m Iz Iz pm/cm iz/cm
ta Parameters 1H NWR 1	sition Parameter 20120222 21.12 spect mm PABBO BB- 25536 65536 65536 65536 23980.814 H 23980.814 H	0.365918 H 1.3664755 s 35.9 20.95.9 20.00 u 300.0 K 300.0 K 2.00000000 s 0.03000000 s 0.03000000 s	HANNEL 11 ==== 13C 2 9.80 u -2.00 d 100.5883377 M	HANNEL f2 ===== waltz16 0 U 80.00 U -2.00 d 17.82 d 17.89 d 17.89 d 399.9946000	ssing parameter 32768 100.5783252 M EM 1.00 H 1.00 H	<pre>it parameters 20.00 c 6.00 c 200.000 p 20115.66 H -0.500 p -0.500 p 10.02500 p 1008.29767 H</pre>
Current Da NAME EXPNO PROCNO	F2 - Acquit Date Time INSTRUM PROBHD 5 PULPROG TD PULPROG TD SOLVENT NS SOLVENT SMH	FIDRES A0 DW DW DW D1 11 d11 d12	===== C NUC1 P1 PL1 SF01	======= C CPDPHG2 NUC2 PCPD2 PCP02 PL12 PL13 PL13 SF02 SF02	F2 - Proce Sf MDW SSB LB LB GB GB	10 NMR pla CY F1 F2 F2 PPMCM H2CM

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ppm



	ຽ ບ	Hz Hz sec usec usec K Sec	usec dB MHz Prs Hz Hz	ст ст Ррт Ррт Ррт Нz/сп/с
meters ct 13c 2 2	Paramet 120225 21.22 spect B0 BB- 2930 65536 CDC13 B	2 78.146 126314 584243 40.3 60.400 6.00 300.0 000000	f1 ==== 10.50 0.00 954701 954701 32768 9330000 9330000 9330000 00 0.00 0.00 0.	leters 20.00 5.00 10.000 1999.93 -0.500 -200.00 1.52500 3.99634
a Para -produ	ition 20 mm PAB	82 0. 3.9 1.00	ANNEL 399.9 399.9 399.9	2095
nt Dat DA	Acquis UM 5 06 5 NT	, v	P7 0 C C C C C C C C C C C C C C C C C C	R plot
CULLE NAME EXPNO PROCN	F2 - Date Date INSTR PROBH PULPR PULPR TD SOLVE NNS	DS SWH AQ AQ DW DF TE D1	MUC1 Pl Pl Pl Pl F2 - Sf S5 MDW S5 S5 S5 S5 S5 S5 S5 S5 S5 S5 S5 S5 S5	10 NM CX CY F1 F1 F2P F22 F22 F22 H2CM H2CM





13C		sec ==== dB MHz	==== usec dB dB MHz	LS HM HZ	ст ст Ррт Нz Нz Hz/ст Hz/ст
ata Parameters p-Cl-DA-Product 2 2	isition Paramett 20120225 19.42 spect 5 mm PABBO BB- 20120225 19.42 1637 1637 1637 1637 1637 1637 1637 1637	0.00002000 CHANNEL f1 ==== 13C 9.80 -2.00 100.5B83377	CHANNEL F2 ==== waltz16 14 80.00 -2.00 15.23 17.89 399.9946000	cessing paramete 32768 100.5783252 00 0.00 1.40	lot parameters 20.00 5.00 200.000 20115.66 -10.000 -1005.78 10.50000 1056.07239
Current D NAME EXPNO PROCNO	-2 - Acqu Date_ Time INSTRUM PHOBHD PULPROG FID SOLVENT NS SOLVENT NS SOLVENT AG RG AG AG AG AG AG AG AG AG AG AG AG AG AG	d12 ======= NUC1 P1 PL1 SF01	======= CPDPRG2 NUC2 PCPD2 PL12 PL13 PL13 SF02	F2 - Pro SS WDW SSB SSB LB CB CB	10 NMA P CX CY F1 F1 F2 PPMCM HZCM

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Current Data Parameters NAME New 1H NMR EXPNO 1 PROCNO 1 PROCNO 1 PROBHD 5 mm PABBO BB- PULPROG 5535 SOLVENT 20120222 Time 20120222 Time 20120222 Time 20120222 Date_ 20120222 SUPPROBHD 5 mm PABBO BB- PULPROG 65536 501 0.33 SOLVENT 00126314 H2 FIDRES 0.126314 H2 COC13 SOLVENT 0.126314 H2 FIDRES 0.126314 H2 FIDRES 0.126314 H2 COC13 SOLVENT 0.126314 H2 FIDRES 0.126444444444444444444444444444444444444	SSB 0.30 Hz LB 0.30 Hz 0 PC 1.00 PC 1.00 TD NMR plot parameters CX 20.00 cm CY 3.00 cm F1P 10.000 ppm F1 3999.93 Hz F2P -200.00 Hz PPMCM 0.5260 ppm/cm HZCM 209.99634 Hz/cm
	3.0506 3.0506 3.0233 3.0905 3.0729 3.072
	2.0712
	<u> </u>
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13C N		s a	Hz Hz sec usec sec sec sec	usec dB MHz === dB dB dB dB MHz	rs MHz Hz	ст ст Н2 Ppm H2 H2/ст H2/ст
Data Parameters m-Cl-DA product		ulsition Paramet 20120223 2017 2017 2017 2017 209030 65536 65536 20013 2037 2037 2037 2037 2037 2037 2037 203	23980.814 0.365518 1.3664755 35.5 20.850 6.00 2.00000000 0.03000000 0.00000000	CHANNEL f1 ==== 13C 9 00 -2.00 100.5883377 -2.00 101 80.00 -2.00 17.89 399.9946000	cessing paramete 32768 100.5783259 EM 1.00 1.00 1.40	lot parameters 20.00 200.000 20115.65 -10.000 -100.78 10.5000 1056.07239
Current NAME	PROCNO	F2 - Acq Date INSTRUM PROBHD PULPROG PULPROG TD SOLVENT NS	SWH F F TDRES AQ DW DD DE D1 D1 d11 d12	NUC1 NUC1 P1 SF01 SF01 CP0PRG2 NUC2 PCD2 PCD2 PCD2 PC12 PC13 SF02 SF02	FF2 - Pro SF WDW SSB SSB GB GB CG	10 NMA P CX CY F1 F1 F1 F2 F2 F7 F7 F7 F7 F7 CM H2CM







Index	Name	Time	Quantity	Height	Area	Area %
		[Min]	[% Area]	[mAU]	[mAU.Min]	[%]
1	UNKNOWN	44.39	50.23	87.0	180.8	50.230
2	UNKNOWN	49.24	49.77	62.7	179.1	49.770
Total			100.00	149.7	359.9	100.000





Index	Name	Time [Min]	Quantity [% Area]	Height [mAU]	Area [mAU.Min]	Area % [%]
1	UNKNOWN	40.72	69.76	72.5	138.2	69.757
2	UNKNOWN	46.79	30.24	25.7	59.9	30.243
Total			100.00	98.2	198.1	100.000





Index	Name	Time	Quantity	Height	Area	Area %
		[Min]	[% Area]	[mAU]	[mAU.Min]	[%]
1	UNKNOWN	28.20	49.72	133.1	145.8	49.722
2	UNKNOWN	32.41	50.28	93.6	147.4	50.278
Total			100.00	226.6	293.2	100.000





Index	Name	Time [Min]	Quantity [% Area]	Height [mAU]	Area [mAU.Min]	Area % [%]
1	UNKNOWN	35.07	34.57	104.3	151.9	34.568
2	UNKNOWN	40.37	65.43	110.4	287.5	65.432
Total			100.00	214.7	439.4	100.000





RUN_245.DATA - Prostar 335 Absorbance Analog Channel 1 EL05079024

Index	Name	Time	Quantity	Height	Area	Area %
	· · ·	[Min]	[% Area]	[mAU]	[mAU.Min]	[%]
1	UNKNOWN	40.13	49.19	100.8	202.6	49.194
2	UNKNOWN	50.33	50.81	46.4	209.2	50.806
Total			100.00	147.2	411.9	100.000





RUN_252.DATA - Prostar 335 Absorbance Analog Channel 1 EL05079024

Index	Name	Time	Quantity	Height	Area	Area %
	State State State	[Min]	[% Area]	[mAU]	[mAU.Min]	[%]
1	UNKNOWN	44.85	33.74	55.5	118.3	33.738
2	UNKNOWN	55.91	66.26	43.8	232.4	66.262
i i						
Total			100.00	99.3	350.7	100.000





Peak results :

Index	Name	Time	Quantity	Height	Area	Area %
		[Min]	[% Area]	[mAU]	[mAU.Min]	[%]
1	UNKNOWN	60.05	50.50	75.1	284.2	50.496
2	UNKNOWN	71.67	49.50	48.0	278.6	49.504
Total			100.00	123.1	562.9	100.000





Index	Name	Time	Quantity	Height	Area	Area %
		[Min]	[% Area]	[mAU]	[mAU.Min]	[%]
1	UNKNOWN	57.59	31.43	80.6	248.0	31.434
2	UNKNOWN	65.56	68.57	92.0	540.9	68.566
Total			100.00	172.6	788.9	100.000