Supporting Information for:

An Efficient Route for the Synthesis of Glycosyl Phosphinic Acids

Charla A. Centrone and Todd L. Lowary*

Department of Chemistry, The Ohio State University

100 West 18th Avenue, Columbus, Ohio 43210

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Experimental general methods and data for new compounds.	S2–S7
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General. Solvents were distilled from the appropriate drying agents before use. Unless stated otherwise, all reactions were carried out at room temperature under a positive pressure of argon and were monitored by TLC on silica gel 60 F₂₅₄. Spots were detected under UV light or by charring with 10% H₂SO₄ in ethanol. Solvents were evaporated under reduced pressure and below 40 °C (bath). Organic solutions of crude products were dried over anhydrous Na₂SO₄. Unless otherwise indicated, column chromatography was performed on silica gel 60 (40–60 μm). The ratio between silica gel and crude product ranged from 100 to 50:1 (w/w). Optical rotations were measured at 21±2 °C. ¹H NMR spectra were recorded at 400 or 500 MHz, and chemical shifts are referenced to either TMS (0.0, CDCl₃, C₅D₅N). ¹³C NMR spectra were recorded at 100 or 125 MHz and chemical shifts are referenced to CDCl₃ (77.00, CDCl₃) or TMS (0.0, C₅D₅N). ³¹P NMR spectra were recorded at 162 or 202 MHz and chemical shifts are referenced to external phosphoric acid (0.0, CDCl₃, C₅D₅N). Electrospray mass spectra were recorded on samples suspended in mixtures of THF and CH₃OH with added trifluoroacetic acid or NaCl.

1-(Octyl)-2,5-anhydroglucityl phosphinic acid (21a). *R*_f 0.45 (1:1, CH₂Cl₂:CH₃OH); [α]_D +10.4 (c 1.0, CH₃OH); ¹H NMR (500 MHz, C₅D₅N) δ_H 0.82 (t, 3 H, *J* = 7.1 Hz), 1.40–1.11 (m, 10 H), 2.09–1.78 (m, 4 H), 2.72 (br s, 2 H), 4.29–4.13 (m, 2 H), 4.47 (br s, 1 H), 4.76 (br s, 1 H), 4.84 (br s, 1 H), 5.10 (br s, 1 H), 8.29 (br s, 4 H); ¹³C NMR (125 MHz, C₅D₅N) δ_C 14.3, 22.9, 29.5, 29.6, 31.2 (d, *J* = 88.0 Hz), 31.4 (d, *J* = 13.9 Hz), 31.4 (d, *J* = 93.8 Hz), 32.1, 63.4, 77.9, 79.8, 79.9, 87.5; ³¹P NMR (202.4 MHz, C₅D₅N) δ_P 49.6; HRMS calcd for C₁₄H₂₉O₆PNa⁺: 347.1594. Found: 347.1607.

1-(Decyl)-2,5-anhydroglucityl phosphinic acid (21b). R_f 0.38 (2:1, CH₂Cl₂:CH₃OH); [α]_D +6.2 (c 1.0, CH₃OH); ¹H NMR (500 MHz, C₅D₅N) δ 0.86 (t, 3 H, J = 7.1 Hz), 1.42–1.18 (m, 14 H), 2.09–1.79 (m, 4 H), 2.72 (br. s, 2 H), 4.16 (dd, 1 H, J = 11.1, 4.0 Hz), 4.24 (dd, 1 H, J = 11.4, 3.2 Hz), 4.47 (br. s, 1 H), 4.75 (br. s, 1 H), 4.83 (br. s, 1 H), 5.16–5.08 (m, 1 H), 8.93 (br. s, 2 H); ¹³C NMR (125 MHz, C₅D₅N) δ 14.4, 23.0, 29.6, 29.7, 29.7, 29.9, 30.1, 30.8, 31.2 (d, J = 92.4 Hz), 31.4 (d, J = 93.6 Hz), 31.5 (d, J = 13.7 Hz), 32.2, 63.4, 78.0, 79.8, 80.0, 87.5; ³¹P NMR (202.4 MHz, C₅D₅N) δ 49.7; HRMS calcd for C₁₆H₃₃O₆PNa⁺: 375.1907. Found: 375.1889.

1-(Dodecyl)-2,5-anhydroglucityl phosphinic acid (21c). R_f 0.50 (2:1, CH₂Cl₂:CH₃OH); [α]_D +7.2 (c 1.1, CH₃OH); ¹H NMR (500 MHz, C₅D₅N) δ 0.87 (t, 3 H, J = 7.1 Hz), 1.41–1.15 (m, 18 H), 2.09–1.76 (m, 4 H), 2.71 (br. s, 2 H), 4.28–4.10 (m, 2 H), 4.47 (br. s, 1 H), 4.75 (br. s, 1 H), 4.82 (br. s, 1 H), 5.10 (br. s, 1 H), 8.00 (br. s, 4 H); ¹³C NMR (125 MHz, C₅D₅N) δ 14.4, 23.1, 29.8, 29.8, 30.0, 30.1, 30.1, 30.9, 31.5 (d, J = 89.0 Hz), 31.6 (d, J = 13.9 Hz), 32.3, 63.5, 78.0, 79.9, 80.0, 87.6; ³¹P NMR (202.4 MHz, C₅D₅N) δ 49.9; HRMS calcd for C₁₈H₃₇O₆PNa⁺: 403.2220. Found: 403.2218.

1-(Hexadecyl)-2,5-anhydroglucityl phosphinic acid (21d). R_f 0.60 (2:1, CH₂Cl₂:CH₃OH); ¹H NMR (500 MHz, C₅D₅N) δ 0.85 (t, 3 H, J = 7.1 Hz), 1.42–1.19 (m, 26 H), 2.05–1.78 (m, 4 H), 2.79–2.66 (m, 2 H), 4.16 (dd, 1 H, J = 11.2, 4.5 Hz), 4.26 (dd, 1 H, J = 11.4, 4.0 Hz), 4.49–4.46 (m, 1 H), 4.76 (br. s, 1 H), 4.84 (br. s, 1 H), 5.13–5.07 (m, 1 H), 7.56 (br. s, 5 H); ¹³C NMR (125 MHz, C₅D₅N) δ 14.4, 23.1, 29.8, 29.8, 30.0, 30.1, 31.5 (d, J = 88.2 Hz), 31.5 (d, J = 14.8 Hz), 31.6 (d, J = 93.8 Hz), 32.3, 63.5, 78.1, 79.9 (d, J = 4.8 Hz), 80.0, 80.0, 87.6; ³¹P NMR (202.4 MHz, C₅D₅N) δ 49.4; HRMS calcd for C₂₂H₄₅O₆PNa⁺: 459.2846. Found: 459.2822.

1-(Eicosanyl)-2,5-anhydroglucityl phosphinic acid (21e). R_f 0.62 (2:1, CH₂Cl₂:CH₃OH); ¹H NMR (500 MHz, C₅D₅N) δ_H 0.86 (t, 3 H, J = 7.1 Hz), 1.45–1.18 (m, 34 H), 2.06–1.79 (m, 4 H), 2.80–2.69 (m, 2 H), 4.17 (dd, 1 H, J = 11.5, 4.7 Hz), 4.27 (dd, 1 H, J = 11.5, 4.5 Hz), 4.51–4.46 (m, 1 H), 4.79–4.76 (m, 1 H), 4.87–4.83 (m, 1 H), 5.15–5.08 (m, 1 H), 6.15 (broad s, 12 H); ¹³C NMR (125 MHz, C₅D₅N) δ_C 14.3, 23.0, 29.6, 29.7, 29.9, 29.9, 30.0, 30.0, 31.3 (d, J = 87.7 Hz), 31.4 (d, J = 14.9 Hz), 31.5 (d, J = 93.2 Hz), 32.1, 63.3, 77.9, 79.8, 79.9 (d, J = 4.9 Hz), 87.4; ³¹P NMR (202.4 MHz, C₅D₅N) δ_P 49.3; HRMS calcd for C₂₆H₅₃O₆PNa⁺: 515.3472. Found: 515.3504.

Diethyl 3,4,6-tri-*O*-benzyl-2,5-anhydroglucityl phosphonate (25). R_f 0.26 (2:1, EtOAc:hexane); $[\alpha]_D^{25}$ +17.4 (c 1.0, CHCl₃); ¹H NMR (400 MHz, CD₃OD) δ_H 1.23 (t, 3 H, J = 7.1 Hz), 1.23 (t, 3 H, J = 7.0 Hz), 2.34–2.14 (m, 2 H), 3.42 (dd, 1 H, J = 9.9, 6.4 Hz), 3.51 (dd, 1 H, J = 9.9, 5.9 Hz), 3.93–3.86 (m, 2 H), 4.07–3.95 (m, 5 H), 4.27–4.19 (m, 1 H), 4.51–4.35 (m, 6 H), 7.33–7.17 (m, 15 H); ¹³C NMR (100 MHz, CD₃OD) δ_C 16.6, 16.7, 26.3 (d, J = 141.1 Hz), 63.2 (d, J = 6.3 Hz), 63.5 (d, J = 6.3 Hz), 71.6, 72.6, 72.7, 74.3, 77.4, 84.3, 84.4, 84.4, 128.8, 128.9, 129.0, 129.1, 129.1, 129.5, 129.5, 129.6, 139.4, 139.4, 139.6; ³¹P NMR (101.2 MHz, CDCl₃) δ_P 29.8; HRMS calcd for C₃₁H₃₉O₇PNa⁺: 577.2326. Found: 577.2332.

3,4,6-tri-*O*-benzyl-2,5-anhydroglucityl phosphine (26). R_f 0.41 (6:1, hexane:EtOAc); $[\alpha]_D$ +33.9 (c 1.0, CHCl₃); ¹H NMR (400 MHz, CDCl₃) δ_H 1.92 (dd, 2 H, J = 7.1, 4.6 Hz), 3.15–2.60 (broad singlet, 2 H), 3.56 (dd, 1 H, J = 9.8, 6.8 Hz), 3.67 (dd, 1 H, J = 9.8, 5.8 Hz), 4.01–3.95 (m, 2 H), 4.19–4.08 (m, 2 H), 4.42 (d, 1 H, J = 11.7 Hz), 4.67–4.54 (m, 5 H), 7.28–7.48 (m, 15 H); ¹³C NMR (100 MHz, CDCl₃) δ_C 13.0 (d, J = 10.5 Hz), 70.5, 71.3, 71.4, 73.3, 82.2, 82.8, 83.2 (d, J = 1.3 Hz), 83.4, 127.5, 127.6,

127.7, 127.7, 127.8, 127.8, 127.9, 128.3, 128.4, 128.4, 128.6, 137.6, 137.7, 138.2; ^{31}P NMR (161.9 MHz, CDCl_3) δ_{P} 150.6; HRMS calcd for $\text{C}_{27}\text{H}_{31}\text{O}_4\text{PNa}^+$: 473.1852. Found: 473.1820.

1-(Octyl)-3,4,6-tri-*O*-benzyl-2,5-anhydroglucityl phosphinic acid (28a). R_f 0.42 (6:1, CH_2Cl_2 : CH_3OH); $[\alpha]_{\text{D}}^{25} +11.7$ (c 1.1, CHCl_3); ^1H NMR (400 MHz, $\text{C}_5\text{D}_5\text{N}$) δ_{H} 0.84 (t, 3 H, $J = 7.1$ Hz), 1.40–1.15 (m, 10 H), 2.07–1.80 (m, 4 H), 2.69–2.60 (m, 2 H), 3.85–3.75 (m, 2 H), 4.29–4.26 (m, 1 H), 4.42–4.32 (m, 2 H), 4.78–4.53 (m, 6 H), 4.98–4.89 (m, 1 H), 7.50–7.20 (m, 15 H), 12.27 (br. s, 1 H); ^{13}C NMR (100 MHz, $\text{C}_5\text{D}_5\text{N}$) δ_{C} 14.3, 22.9, 29.4, 29.6, 30.5 (d, $J = 88.7$ Hz), 31.4 (d, $J = 14.5$ Hz), 31.5 (d, $J = 94.0$ Hz), 32.1, 71.6, 71.6, 71.9, 73.4, 77.6, 83.4, 84.2 (d, $J = 6.0$ Hz), 84.7, 127.9, 128.0, 128.1, 128.1, 128.3, 128.7, 128.8, 138.8, 139.0, 139.1; ^{31}P NMR (161.9 MHz, $\text{C}_5\text{D}_5\text{N}$) δ_{P} 48.6; HRMS calcd for $\text{C}_{35}\text{H}_{47}\text{O}_6\text{PNa}^+$: 617.3002. Found: 617.3007.

1-(Decyl)-3,4,6-tri-*O*-benzyl-2,5-anhydroglucityl phosphinic acid (28b). R_f 0.57 (3:1, CH_2Cl_2 : CH_3OH); $[\alpha]_{\text{D}}^{25} +12.4$ (c 1.0, CHCl_3); ^1H NMR (500 MHz, $\text{C}_5\text{D}_5\text{N}$) δ_{H} 0.85 (t, 3 H, $J = 7.1$ Hz), 1.41–1.15 (m, 14 H), 2.08–1.81 (m, 4 H), 2.68–2.60 (m, 2 H), 3.83–3.73 (m, 2 H), 4.27–4.24 (m, 1 H), 4.39–4.31 (m, 2 H), 4.74–4.52 (m, 6 H), 4.95–4.88 (m, 1 H), 7.50–7.20 (m, 15 H), 11.22 (br. s, 1 H); ^{13}C NMR (125 MHz, $\text{C}_5\text{D}_5\text{N}$) δ_{C} 14.3, 22.9, 29.6, 29.7, 29.8, 29.9, 30.5 (d, $J = 88.5$ Hz), 31.4 (d, $J = 14.6$ Hz), 31.6 (d, $J = 92.7$ Hz), 32.1, 71.6, 71.6, 71.9, 73.4, 77.6, 83.4, 84.2 (d, $J = 6.0$ Hz), 84.7, 127.9, 128.0, 128.1, 128.1, 128.3, 128.7, 128.8, 138.8, 139.0, 139.1; ^{31}P NMR (161.9 MHz, $\text{C}_5\text{D}_5\text{N}$) δ_{P} 49.0; HRMS calcd for $\text{C}_{37}\text{H}_{51}\text{O}_6\text{PNa}^+$: 645.3315. Found: 645.3344.

1-(Dodecyl)-3,4,6-tri-*O*-benzyl-2,5-anhydroglucityl phosphinic acid (28c). R_f 0.27 (6:1, CH_2Cl_2 : CH_3OH); $[\alpha]_{\text{D}}^{25} +11.4$ (c 1.1, CHCl_3); ^1H NMR (500 MHz, $\text{C}_5\text{D}_5\text{N}$) δ_{H}

0.87 (t, 3 H, $J = 7.1$ Hz), 1.45–1.18 (m, 18 H), 2.10–1.82 (m, 4 H), 2.69–2.60 (m, 2 H), 3.85–3.74 (m, 2 H), 4.28–4.25 (m, 1 H), 4.41–4.32 (m, 2 H), 4.78–4.55 (m, 6 H), 4.97–4.89 (m, 1 H), 7.50–7.25 (m, 15 H), 8.05 (br. s, 1 H); ^{13}C NMR (125 MHz, $\text{C}_5\text{D}_5\text{N}$) δ_{C} 14.3, 23.0, 29.6, 29.7, 29.8, 29.9, 30.0, 30.2, 30.6 (d, $J = 89.2$ Hz), 31.4 (d, $J = 14.4$ Hz), 31.6 (d, $J = 92.2$ Hz), 32.2, 71.6, 71.6, 71.9, 73.4, 77.6, 83.4, 84.2 (d, $J = 5.4$ Hz), 84.7, 127.9, 128.0, 128.1, 128.1, 128.3, 128.7, 128.8, 128.8, 138.8, 139.0, 139.1; ^{31}P NMR (161.9 MHz, $\text{C}_5\text{D}_5\text{N}$) δ_{P} 48.8; HRMS calcd for $\text{C}_{39}\text{H}_{55}\text{O}_6\text{PNa}^+$: 673.3628. Found: 673.3622.

1-(Hexadecyl)-3,4,6-tri-*O*-benzyl-2,5-anhydroglucityl phosphinic acid (28d).

R_f 0.41 (6:1, $\text{CH}_2\text{Cl}_2:\text{CH}_3\text{OH}$); $[\alpha]_{\text{D}}^{25} +10.3$ (c 1.0, CHCl_3); ^1H NMR (500 MHz, $\text{C}_5\text{D}_5\text{N}$) δ_{H} 0.86 (t, 3 H, $J = 7.1$ Hz), 1.42–1.18 (m, 26 H), 2.07–1.81 (m, 4 H), 2.68–2.60 (m, 2 H), 3.83–3.73 (m, 2 H), 4.26–4.25 (m, 1 H), 4.39–4.32 (m, 2 H), 4.74–4.53 (m, 6 H), 4.96–4.89 (m, 1 H), 7.47–7.26 (m, 15 H), 9.88 (br. s, 1 H); ^{13}C NMR (100 MHz, $\text{C}_5\text{D}_5\text{N}$) δ_{C} 14.3, 23.0, 29.7, 29.7, 29.7, 29.9, 30.0, 30.0, 30.5 (d, $J = 88.5$ Hz), 31.0, 31.4 (d, $J = 14.5$ Hz), 31.6 (d, $J = 92.7$ Hz), 32.2, 71.3, 71.6, 71.9, 73.4, 77.6, 83.4, 84.2 (d, $J = 5.7$ Hz), 84.7, 127.9, 128.0, 128.1, 128.1, 128.3, 128.7, 128.8, 138.8, 139.0, 139.1; ^{31}P NMR (161.9 MHz, $\text{C}_5\text{D}_5\text{N}$) δ_{P} 48.8; HRMS calcd for $\text{C}_{43}\text{H}_{63}\text{O}_6\text{PNa}^+$: 729.4254. Found: 729.4297.

1-(Eicosanyl)-3,4,6-tri-*O*-benzyl-2,5-anhydroglucityl phosphinic acid (28e).

R_f 0.29 (6:1, $\text{CH}_2\text{Cl}_2:\text{CH}_3\text{OH}$); $[\alpha]_{\text{D}}^{25} +9.7$ (c 1.1, CHCl_3); ^1H NMR (500 MHz, $\text{C}_5\text{D}_5\text{N}$) δ_{H} 0.87 (t, 3 H, $J = 7.1$ Hz), 1.45–1.17 (m, 34 H), 2.10–1.81 (m, 4 H), 2.70–2.59 (m, 2 H), 3.85–3.74 (m, 2 H), 4.27 (br. s, 1 H), 4.39–4.32 (m, 2 H), 4.76–4.54 (m, 6 H), 4.92 (br. s, 1 H), 7.50–7.26 (m, 15 H), 8.10 (br. s, 1 H); ^{13}C NMR (100 MHz, $\text{C}_5\text{D}_5\text{N}$) δ_{C} 14.3, 23.0,

29.6, 29.8, 30.0, 30.0, 30.1, 30.5 (d, $J = 87.0$ Hz), 30.9, 31.5 (d, $J = 12.5$ Hz), 31.6 (d, $J = 89.6$ Hz), 32.2, 71.6, 71.6, 71.9, 73.4, 77.7, 83.3, 84.2, 84.7, 127.9, 128.0, 128.1, 128.1, 128.3, 128.7, 128.8, 138.8, 139.0, 139.4; ^{31}P NMR (202.4 MHz, $\text{C}_5\text{D}_5\text{N}$) δ_{P} 47.4; HRMS calcd for $\text{C}_{47}\text{H}_{71}\text{O}_6\text{PNa}^+$: 785.4880. Found: 785.4893.

1-*p*-toluenesulfonyloxy-eicosane (32). R_f 0.49 (10:1, hexane:EtOAc); ^1H NMR (250 MHz, CDCl_3) δ_{H} 0.86 (t, 3 H, $J = 6.9$ Hz), 1.33–1.14 (m 34 H), 1.68–1.55 (m, 2 H), 2.43 (s, 3 H), 4.00 (t, 2 H, $J = 6.6$ Hz), 7.31 (d, 2 H, $J = 8.0$ Hz), 7.77 (d, 2 H, $J = 8.3$ Hz); ^{13}C NMR (62.5 MHz, CDCl_3) δ_{C} 14.1, 21.6, 22.7, 25.3, 28.8, 28.9, 29.3, 29.4, 29.5, 29.6, 29.7, 29.7, 31.9, 70.7, 127.9, 129.8, 133.3, 144.6; HRMS calcd for $\text{C}_{27}\text{H}_{48}\text{O}_3\text{SNa}^+$: 475.3216. Found: 475.3240.

Current Data Parameters
NAME CC-x-63
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20030129
Time 14.07

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TD 65536
SOLVENT Pyr
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DE 6.00 usec
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F2 - Processing parameters
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SSB 0
LB 0.30 Hz
GB 0
PC 1.00

1D NMR plot parameters
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F1 5733.74 Hz
F2P -1.715 ppm
F2 -857.64 Hz
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HZCM 338.01953 Hz/cm

Current Data Parameters
NAME CC-x-63
EXPNO 3
PROCNO 1

F2 - Acquisition Parameters
Date_ 20030129
Time 14.26

INSTRUM spect
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PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 961
DS 4
SWH 31446.541 Hz
FIDRES 0.479836 Hz
AQ 1.0420724 sec
RG 4096
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DE 6.00 usec
TE 300.0 K
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D11 0.03000000 sec
D12 0.00002000 sec

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PL1 3.00 dB
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PCPD2 100.00 usec
PL2 -1.00 dB
PL12 18.80 dB
PL13 18.80 dB
SF02 500.0220001 MHz

F2 - Processing parameters
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SF 125.7302311 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters
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F1 19431.59 Hz
F2P -1.068 ppm
F2 -134.22 Hz
SFOCM 7.98038 ppm/cm
FZCM 1003.37500 Hz/cm

Current Data Parameters
 NAME CC-x-63
 EXPNO 2
 PROCNO 1

F2 - Acquisition Parameters
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 Time 14.16

INSTRUM spect
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 SOLVENT Aceton
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 DS 4

SWH 80645.164 Hz
 FIDRES 1.230548 Hz
 AQ 0.4063732 sec
 RG 3649.1

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 TE 300.0 K
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 D11 0.03000000 sec
 D12 0.00002000 sec

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 P1 10.75 usec
 PL1 5.00 dB
 SF01 202.4216766 MHz

===== CHANNEL f2 =====
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 NUC2 ¹H
 PCPD2 100.00 usec
 PL2 -1.00 dB
 PL12 18.80 dB
 PL13 18.80 dB
 SF02 500.0220001 MHz

F2 - Processing parameters
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 WDW EM
 SSB 0
 GB 1.00 Hz
 GC 0
 SC 1.40

10 NMR plot parameters
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 F1 20241.16 Hz
 F2P -180.000 ppm
 F2 -36434.08 Hz
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 HZCM 2576.14697 Hz/cm

Current Data Parameters
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 PROCNO 1

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 SOLVENT Pye
 NS 16
 DS 2
 SMH 10330.578 Hz
 FIDRES 0.157632 Hz
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 RG 35.9
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 TE 300.0 K
 D1 1.00000000 sec

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F2 - Processing parameters
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 SF 500.0205476 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

1D NMR plot parameters
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 F1 5262.72 Hz
 F2P -0.474 ppm
 F2 -236.91 Hz
 DPMCM 0.56404 ppm/cm
 HZCM 282.03250 Hz/cm

Current Data Parameters
NAME cc-c10-500
EXPNO 3
PROCNO 1

F2 - Acquisition Parameters

Date_ 20030215
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INSTRUM spect
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PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1816
DS 4
SWH 31446.541 HZ
FIDRES 0.479836 HZ
AQ 1.0420724 sec
RG 4096
DW 15.900 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

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P1 13.00 usec
PL1 3.00 dB
SFO1 125.7439093 MHz

===== CHANNEL f2 =====
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PCPD2 100.00 usec
PL2 -1.00 dB
PL12 18.80 dB
PL13 18.80 dB
SFO2 500.0220001 MHz

F2 - Processing Parameters
SI 32768
SF 125.7302254 MHz
WDW EM
SSB 0
-B 1.00 HZ
GB 0
PC 1.40

1D NMR plot parameters
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F1 29549.67 HZ
F2P -15.032 ppm
F2 -1889.99 HZ
PPMCM 12.82341 ppm/cm
HZCM 1612.29028 HZ/cm

Current Data Parameters
NAME cc-10-500
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters

Date_ 20030215
Time 13.18
INSTRUM spect
PROBHD 5 mm BBO 39-1
PULPROG zgpg30
TD 65536
SOLVENT Aceton
VS 16
DS 4
SWH 80645.164 Hz
FIDRES 1.230548 Hz
AQ 0.4063732 sec
RG 6502
DM 6.200 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.0002000 sec

49.6957

===== CHANNEL f1 =====
NUC1 31P
P1 10.75 usec
PL1 5.00 dB
SF01 202.4216766 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 100.00 usec
PL2 -1.00 dB
PL12 18.80 dB
PL13 18.80 dB
SF02 500.0220001 MHz

F2 - Processing parameters
SI 32768
SF 202.4115560 MHz
WDW EM
SSB 0
GB 1.00 Hz
CB 0
PC 1.40

F0 NMR plot parameters
CX 22.00 cm
F1 249.211 ppm
F2 50443.17 Hz
F3 -149.211 ppm
F4 30203.06 Hz
F5 18.11008 ppm/cm
F6 65.68945 Hz/cm

Current Data Parameters

NAME cc-x-60-500
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters

Date_ 20030131
Time 9.52
INSTRUM spect
PROBHD 5 mm BBO BB-1
PULPROG zg30
TD 65536
SOLVENT Pyr
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 50.8
JM 48.400 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec

Processing parameters

NUC1 1H
P1 14.75 usec
PL1 -1.00 dB
SF01 500.0230878 MHz

1D NMR plot parameters

SI 32768
SF 500.0207317 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
CX 19.50 cm
F1P 12.139 ppm
F1 6069.65 Hz
F2P -0.170 ppm
F2 -85.03 Hz
PPMCM 0.63122 ppm/cm
HZCM 315.62494 Hz/cm

Current Data Parameters
NAME CC-x-60-500
EXPNO 3
PROCNO 1

F2 - Acquisition Parameters

Date_ 20030131
Time 10.05
INSTRUM spect
PROBHD 5 mm BB0 BB-1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1696
DS 4
SWH 31446.541 Hz
FIDRES 0.479836 Hz
AQ 1.0420724 sec
RG 4096
DM 15.900 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

===== CHANNEL f1 =====

NUC1 13C
P1 13.00 usec
PL1 3.00 dB
SF01 125.7439093 MHz

===== CHANNEL f2 =====

CPDPRG2 waltz16
NUC2 1H
PCPD2 100.00 usec
PL2 -1.00 dB
PL12 18.80 dB
PL13 18.80 dB
SF02 500.0220001 MHz

F2 - Processing parameters

SI 32768
SF 125.7302705 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters

CX 19.50 cm
F1P 158.532 ppm
F1 19932.28 Hz
F2P -1.380 ppm
F2 -173.56 Hz
PPMCM 8.20064 ppm/cm
HZCM 1031.06897 Hz/cm

Current Data Parameters
 NAME CC-X-60-500
 EXPNO 2
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20030131

Time 10.00
 INSTRUM spect
 PROBHD 5 mm BBO BB-1
 PULPROG zgpg30
 TD 65536
 SOLVENT Aceton
 NS 102

DS 4
 SWH 80645.164 Hz
 FIDRES 1.230548 Hz
 AQ 0.4063732 sec
 RG 4597.6

DW 6.200 usec
 DE 6.00 usec
 TE 300.0 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 D12 0.00002000 sec

===== CHANNEL f1 =====
 NUC1 31P
 P1 10.75 usec
 PL1 5.00 dB
 SF01 202.4216766 MHz

===== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 100.00 usec
 PL2 -1.00 dB
 PL12 18.80 dB
 PL13 18.80 dB
 SF02 500.0220001 MHz

F2 - Processing parameters
 SI 32768
 SF 202.4115560 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

1D NMR plot parameters
 CX 22.00 cm
 C1P 100.000 ppm
 F1 20241.16 Hz
 F2P -180.000 ppm
 F2 -36434.08 Hz
 PCPMCM 12.72727 ppm/cm
 HZCM 2576.14697 Hz/cm

Current Data Parameters
 NAME CC-x-62fcpyr
 EXPNO 1
 PROCNO 1

F2 - Acquisition Parameters

Date_ 20030124
 Time 14.42
 INSTRUM spect
 PROBHD 5 mm BBO BB-1
 PULPROG zg30
 TD 65536
 SOLVENT Pyr
 NS 16
 DS 2
 SWH 10330.578 Hz
 FIDRES 0.157632 Hz
 AQ 3.1719923 sec
 RG 181
 DW 48.400 usec
 DE 6.00 usec
 TE 300.0 K
 D1 1.00000000 sec

===== CHANNEL f1 =====
 NUC1 1H
 P1 14.75 usec
 PL1 -1.00 dB
 SF01 500.0230878 MHz

F2 - Processing parameters
 SI 32768
 SF 500.0200000 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

1D NMR plot parameters
 CX 19.50 cm
 F1P 10.316 ppm
 F1 5158.19 Hz
 F2P -1.639 ppm
 F2 -819.70 Hz
 ZPCMC 0.61309 ppm/cm
 HZCM 306.55823 Hz/cm

Current Data Parameters
NAME CC-x-62fcpyn
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters

Date_ 20030124
Time 14.46
INSTRUM spect
PROBHD 5 mm BBO BB-1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1024
DS 4
SWH 31446.541 Hz
FIDRES 0.479836 Hz
AQ 1.0420724 sec
RG 4096
DM 15.900 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

===== CHANNEL f1 =====
NUC1 13C
P1 13.00 usec
PL1 3.00 dB
SFO1 125.7439093 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 100.00 usec
PL2 -1.00 dB
PL12 18.80 dB
PL13 18.80 dB
SFO2 500.0220001 MHz

F2 - Processing parameters
SI 32768
SF 125.7300790 MHz
WDW EM
SSB 0
-B 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters
CX 19.50 cm
F1P 235.056 ppm
F1 29553.58 Hz
F2P -15.056 ppm
F2 -1892.96 Hz
PPMCM 12.82623 ppm/cm
HZCM 1612.64307 Hz/cm

Current Data Parameters
 NAME cc-x-62fcdpvr
 EXPNO 2
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20030123
 Time 14.20

INSTRUM spect
 PROBHD 5 mm BBO BB-1
 PULPROG zgpg30
 TD 65536
 SOLVENT Aceton
 NS 16
 DS 4
 SWH 80645.164 Hz
 FIDRES 1.230548 Hz
 AQ 0.4063732 sec
 RG 16384
 JW 6.200 usec
 JE 6.00 usec
 FE 300.0 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 D12 0.0002000 sec

===== CHANNEL f1 =====
 NUC1 31P
 P1 10.75 usec
 PL1 5.00 dB
 SFO1 202.4216766 MHz

===== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 100.00 usec
 PL2 -1.00 dB
 PL12 18.80 dB
 PL13 18.80 dB
 SFO2 500.0220001 MHz

F2 - Processing parameters
 SI 32768
 SF 202.4115560 MHz
 WDW EM
 SSB 0
 -B 1.00 Hz
 GB 0
 PC 1.40

1D NMR plot parameters
 CX 22.00 cm
 F1P 249.211 ppm
 F1 50443.17 Hz
 FBP -149.211 ppm
 F30202.00 Hz
 18 11008 ppm/cm
 65.68945 Hz/cm

49. 43.99

ppm

8.7100

7.5638

7.1958

6.1456

5.1128

4.8542

4.7732

4.4895

4.4819

4.2773

4.2628

4.2545

4.1910

4.1814

4.1681

4.1586

3.5934

2.7353

2.7298

2.7192

2.7062

2.0151

1.9960

1.9877

1.9681

1.8709

1.8574

1.8406

1.3652

1.3513

1.2979

1.2671

1.2560

1.2432

1.2236

0.8724

0.8590

0.8449

0.0155

Current Data Parameters
NAME CC-x-64pyr
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20030202

Time 19.06

INSTRUM spect

PROBHD 5 mm BBO BB-1

PULPROG zg30

TD 65536

SOLVENT Pyr

NS 16

DS 2

SWH 10330.578 Hz

FIDRES 0.157632 Hz

AQ 3.1719923 sec

RG 181

DW 48.400 usec

DE 6.00 usec

TE 300.0 K

D1 1.00000000 sec

===== CHANNEL f1 =====

NUC1 1H

P1 14.75 usec

PL1 -1.00 dB

SFO1 500.0230878 MHz

F2 - Processing parameters

SI 32768

SF 500.0205656 MHz

WDW EM

SSB 0

LB 0.30 Hz

GB 0

PC 1.00

1D NMR plot parameters

CX 19.50 cm

F1P 9.588 ppm

F1 4794.41 Hz

F2P -0.974 ppm

F2 -486.87 Hz

PPMCM 0.54165 ppm/cm

HZCM 270.83517 Hz/cm

Integral

ppm

8

12.196

0.735

1.584

0.784

1.599

1.567

4.054

36.691

3.000

0

Current Data Parameters
NAME CC-X-64dyr
EXPNO 3
PROCNO 1

F2 - Acquisition Parameters

Date_ 20030202
Time 19.21
INSTRUM spect
PROBHD 5 mm BBO BB-1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1500
DS 4
SWH 31446.541 Hz
FIDRES 0.479836 Hz
AQ 1.0420724 sec
RG 4597.6
DM 15.900 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

===== CHANNEL f1 =====
NUC1 13C
P1 13.00 usec
PL1 3.00 dB
SF01 125.7439093 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 100.00 usec
PL2 -1.00 dB
PL12 18.80 dB
PL13 18.80 dB
SF02 500.0220001 MHz

F2 - Processing parameters
SI 32768
SF 125.7302388 MHz
WDW EM
SSB 0
-B 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters
CX 19.50 cm
F1P 161.933 ppm
F1 20359.86 Hz
F2P -9.142 ppm
F2 -1149.40 Hz
OPMCM 8.77306 ppm/cm
HZCM 1103.03906 Hz/cm

Current Data Parameters
NAME CC-x-64pyr
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters

Date_ 20030202
Time 19.12
INSTRUM spect
PROBHD 5 mm BBO BB-1
PULPROG zgpg30
TD 65536
SOLVENT Aceton
NS 100
DS 4
SWH 80645.164 Hz
FIDRES 1.230548 Hz
AQ 0.4063732 sec
RG 9195.2
DW 6.200 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

===== CHANNEL f1 =====

NUC1 ³¹P
P1 10.75 usec
PL1 5.00 dB
SFO1 202.4216766 MHz

===== CHANNEL f2 =====

CPDPRG2 waltz16
NUC2 ¹H
PCPD2 100.00 usec
PL2 -1.00 dB
PL12 18.80 dB
PL13 18.80 dB
SFO2 500.0220001 MHz

F2 - Processing parameters

SI 32768
SF 202.4115560 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters

CX 22.00 cm
F1P 100.000 ppm
F1 20241.16 Hz
F2P -180.000 ppm
F2 -36434.08 Hz
APWGM 12.72727 ppm/cm
HZCM 2576.14697 Hz/cm

49.3060

Current Data Parameters
 NAME CC-I-43
 EXPNO 1
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 990728
 Time 11.11
 INSTRUM spect
 PROBD 5 mm BBO BB-1
 PULPROG zg30
 TD 65536
 SOLVENT MeOH
 NS 16
 DS 2
 SMH 8278.146 Hz
 FIDRES 0.126314 Hz
 AQ 3.9584243 sec
 RG 57
 DM 60.400 usec
 DE 6.00 usec
 TE 300.0 K
 D1 1.00000000 sec

===== CHANNEL f1 =====
 NUC1 1H
 P1 7.50 usec
 PL1 -6.00 dB
 SF01 400.1324710 MHz

F2 - Processing parameters
 SI 32768
 SF 250.1300161 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

1D NMR plot parameters
 CX 19.50 cm
 F1 8.858 ppm
 F2 2215.77 Hz
 F2P -0.982 ppm
 F2 -245.73 Hz
 PPMCM 0.50466 ppm/cm
 HZCM 126.23067 Hz/cm

Current Data Parameters
NAME CC-I-43
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 990728
Time 11.27

INSTRUM spect

PROBHD 5 mm BBO BB-1

PULPROG zgpg30

TD 65536

SOLVENT MeOH

NS 352

DS 4

SWH 25125.629 Hz

FIDRES 0.383387 Hz

AQ 1.3042164 sec

RG 8192

OW 19.900 usec

DE 6.00 usec

TE 300.0 K

D1 2.00000000 sec

d11 0.03000000 sec

d12 0.00002000 sec

===== CHANNEL f1 =====
NUC1 13C
P1 5.90 usec
PL1 -6.00 dB
SF01 100.6237959 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -6.00 dB
PL12 15.80 dB
PL13 15.80 dB
SF02 400.1316005 MHz

F2 - Processing Parameters
SI 32768
SF 62.8951471 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters
CX 19.50 cm
F1P 154.152 ppm
F1 9695.40 Hz
F2P 3.232 ppm
F2 203.28 Hz
SPMCM 7.73948 ppm/cm
HZCM 486.77542 Hz/cm

S24

29.7790

Current Data Parameters
NAME cc-2-5-03
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20030205
Time 17.56
INSTRUM spect
PROBHD 5 mm QNP 1H/
PULPROG zgpg30
TD 65536
SOLVENT DMS
NS 2
DS 4
SWH 40550.405 Hz
FIDRES 0.620276 Hz
AQ 0.8061428 sec
RG 9195.2
DE 12.300 usec
TE 300.0 K
D1 2.00000000 sec
d11 0.03000000 sec
d12 0.0002000 sec

===== CHANNEL f1 =====
NUC1 31P
P1 6.00 usec
PL1 -4.00 dB
SFO1 101.2492922 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -4.00 dB
PL12 16.00 dB
PL13 17.00 dB
SFO2 250.1310005 MHz

F2 - Processing parameters
SI 32768
SF 101.2543550 MHz
WDW EM
SSB 0
LB 5.00 Hz
GB 0
PC 1.40

1D NMR plot parameters
CX 34.00 cm
F1P 100.000 ppm
F1 10125.44 Hz
F2P -180.000 ppm
F2 -18225.78 Hz
PPMCM 8.23529 ppm/cm
HZCM 833.85936 Hz/cm

Current Data Parameters
 NAME cc-arabphosphin
 EXPNO 1
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20030221
 Time 20.01
 INSTRUM spect
 PROBHD 5 mm BBO BB-1
 PULPROG zg30
 TD 32768
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 8278.146 Hz
 FIDRES 0.252629 Hz
 AQ 1.9792372 sec
 RG 64
 DW 60.400 usec
 DE 6.00 usec
 TE 300.0 K
 D1 1.00000000 sec

===== CHANNEL f1 =====
 NUC1 1H
 P1 7.50 usec
 PL1 -6.00 dB
 SFO1 400.1324710 MHz

F2 - Processing parameters
 SI 32768
 SF 400.130000 MHz
 WDM EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

1D NMR plot parameters
 CX 19.50 cm
 F1P 10.835 ppm
 F1 4335.44 Hz
 F2P -0.753 ppm
 F2 -301.20 Hz
 PPMQCM 0.59425 ppm/cm
 HZCM 237.77621 Hz/cm

Current Data Parameters

NAME cc-arabphosphin
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters

Date_ 20030221
Time 20.05
INSTRUM spect
PROBHD 5 mm BBO BB-1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 332
DS 4
SWH 25125.629 HZ
FIDRES 0.383387 HZ
AQ 1.3042164 sec
RG 16384
DM 19.900 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
d11 0.03000000 sec
d12 0.00002000 sec

===== CHANNEL f1 =====

VUC1 13C
P1 5.90 usec
PL1 -6.00 dB
SF01 100.6237959 MHz

===== CHANNEL f2 =====

CPDPRG2 waltz16
VUC2 1H
PCPD2 80.00 usec
PL2 -6.00 dB
PL12 15.80 dB
PL13 15.80 dB
SF02 400.1316005 MHz

F2 - Processing parameters

SF 32768
SF 100.6127755 MHz
WDW EM
SSB 0
GB 1.00 HZ
PC 1.40

1D NMR plot parameters

CX 19.50 cm
F1 157.611 ppm
F1 15867.64 HZ
F2 -1.542 ppm
F2 -155.18 HZ
SFOCM 8.16169 ppm/cm
HZCM 821.17029 HZ/cm

Current Data Parameters
NAME cc-araphosphonin
EXPNO 3
PROCNO 1

F2 - Acquisition Parameters
Date_ 20030221
Time 20.24

INSTRUM spect
PROBHD 5 mm BBO BB-1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 100
DS 4

SWH 64935.066 Hz
FIDRES 0.990830 Hz
AQ 0.5046772 sec
RG 9195.2

DW 7.700 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
d11 0.03000000 sec
d12 0.00002000 sec

===== CHANNEL f1 =====
NUC1 31P
P1 4.95 usec
PL1 -6.00 dB
SF01 161.9672941 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -6.00 dB
PL12 15.80 dB
PL13 15.80 dB
SF02 400.1316005 MHz

F2 - Processing parameters
SI 32768
SF 161.9753930 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters
CX 22.00 cm
F1P -91.563 ppm
F1 -14830.94 Hz
F2P -235.060 ppm
F2 -38077.18 Hz
PPMCM 6.52360 ppm/cm
HZCM 1056.64722 Hz/cm

Current Data Parameters

NAME CC-x-41-pyr

EXPNO 1

PROCNO 1

F2 - Acquisition Parameters

Date_ 20030103

Time 11.51

INSTRUM spect

PROBHD 5 mm BBO BB-1

PULPROG zg30

TD 32768

SOLVENT Pyr

NS 16

DS 2

SWH 8278.146 Hz

FIDRES 0.252629 Hz

AG 1.9792372 sec

RG 40.3

DM 60.400 usec

DE 6.00 usec

TE 300.0 K

D1 1.00000000 sec

===== CHANNEL f1 =====

NUC1 1H

Q1 7.50 usec

PL1 -6.00 dB

SFO1 400.1324710 MHz

F2 - Processing parameters

SI 32768

SF 400.130479 MHz

WDW EM

SSB 0

LB 0.30 Hz

GB 0

PC 1.00

1D NMR plot parameters

CX 19.50 cm

F1P 13.241 ppm

F1 5298.25 Hz

F2P -1.161 ppm

F2 -464.74 Hz

OPMCM 0.73860 ppm/cm

HZCM 295.53790 Hz/cm

Current Data Parameters
NAME CC-x-41-pyr
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters

Date_ 20030103
Time 11:58
INSTRUM spect
PROBHD 5 mm BBO BB-1
PULPROG zgpg30
TD 65536
SOLVENT Pyr
NS 630
DS 4
SWH 25125.629 HZ
FIDRES 0.383387 HZ
AQ 1.3042164 sec
RG 9195.2
DM 19.900 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
d11 0.03000000 sec
d12 0.00002000 sec

===== CHANNEL f1 =====
NUC1 13C
P1 5.90 usec
PL1 -6.00 dB
SF01 100.6237959 MHZ

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -6.00 dB
PL12 15.80 dB
PL13 15.80 dB
SF02 400.1316005 MHZ

F2 - Processing parameters
SI 32768
SF 100.6128555 MHZ
WDW EM
SSB 0
LB 1.00 HZ
GB 0
PC 1.40

1D NMR plot parameters
CX 19.50 cm
F1P 161.504 ppm
F1 16249.40 HZ
F2P -5.549 ppm
F2 -558.30 HZ
SFOCM 8.56683 ppm/cm
H7CM 861.93353 HZ/cm

Current Data Parameters
NAME CC-X-41-Pyr
EXPNO 3
PROCNO 1

-2 - Acquisition Parameters

Date_ 20030103
Time 12.33
INSTRUM spect
PROBHD 5 mm BBO BB-1
PULPROG zgpg30
TD 65536
SOLVENT Pyr
NS 16
DS 4
SWH 64935.066 Hz
FIDRES 0.990830 Hz
AQ 0.5046772 sec
RG 9195.2
CW 7.700 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
d11 0.03000000 sec
d12 0.00002000 sec

===== CHANNEL f1 =====
NUC1 31P
P1 4.95 usec
PL1 -6.00 dB
SF01 161.9672941 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -6.00 dB
PL12 15.80 dB
PL13 15.80 dB
SF02 400.1316005 MHz

F2 - Processing parameters
SI 32768
SF 161.9753930 MHz
WDW EM
SSB 0
GB 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters
CX 22.00 cm
F1P 100.000 ppm
F1 16197.54 Hz
F2P 180.000 ppm
F2 29155.51 Hz
PC 12.72727 ppm/cm
61.50488 Hz/cm

48.6493

ppm

Current Data Parameters

NAME	CC-x-47/Py
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20030106
Time	14.23
INSTRUM	spect
PROBHD	5 mm BBO BB-1
PULPROG	zg30
TD	65536
SOLVENT	Py
NS	16
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1719923 sec
RG	50.8
DW	48.400 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

===== CHANNEL f1 =====

NUC1	¹ H
P1	14.75 usec
PL1	-1.00 dB
SFO1	500.0230878 MHz

F2 - Processing parameters

SI	32768
SF	500.0207550 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

1D NMR plot parameters

CX	19.50 cm
F1P	12.621 ppm
F1	6311.00 Hz
F2P	-1.482 ppm
F2	-740.93 Hz
PPMCM	0.72324 ppm/cm
HZCM	361.63727 Hz/cm

Current Data Parameters
NAME CC-X-47pyr
EXPNO 3
PROCNO 1

F2 - Acquisition Parameters
Date_ 20030106
Time 14.50

INSTRUM spect
PROBHD 5 mm BBO BB-1
PULPROG zgpg30

TD 65536
SOLVENT CDCl3
NS 671

DS 4
SWH 31446.541 Hz
FIDRES 0.479836 Hz

AQ 1.0420724 sec
RG 4096

DM 15.900 usec
DE 6.00 usec

TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

===== CHANNEL f1 =====
NUC1 13C
P1 13.00 usec
PL1 3.00 dB
SF01 125.7439093 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 100.00 usec
PL2 -1.00 dB
PL12 18.80 dB
PL13 18.80 dB
SF02 500.0220001 MHz

F2 - Processing parameters
SI 32768
SF 125.7302849 MHz
WDW EM
SSB 0
GB 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters
CX 19.50 cm
F1P 235.024 ppm
F1 29549.69 Hz
F2P -15.032 ppm
F2 -1889.99 Hz
SFOCM 12.82341 ppm/cm
HZCM 1612.29114 Hz/cm

Current Data Parameters
NAME CC-X-47pyr-phos
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters

Date_ 20030106
Time 15.05
INSTRUM spect
PROBHD 5 mm BBO BB-1
PULPROG zgpg30
TD 65536
SOLVENT Pyr
NS 16
DS 4
SWH 64935.066 Hz
FIDRES 0.990830 Hz
AQ 0.5046772 sec
RG 9195.2
DM 7.700 usec
DE 6.00 usec
TE 300.0 K
J1 2.00000000 sec
d11 0.03000000 sec
j12 0.00002000 sec

28b

ppm

Integral

Current Data Parameters
 NAME cc-x-50pyr
 EXPNO 1
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20030106
 Time 13.18
 INSTRUM spect
 PROBHD 5 mm BBO BB-1
 PULPROG zg30
 TD 65536
 SOLVENT Pyr
 NS 16
 DS 2
 SWH 10330.578 Hz
 FIDRES 0.157632 Hz
 AQ 3.1719923 sec
 RG 64
 DW 48.400 usec
 DE 6.00 usec
 TE 300.0 K
 D1 1.00000000 sec

===== CHANNEL f1 =====
 NUC1 1H
 P1 14.75 usec
 PL1 -1.00 dB
 SF01 500.0230878 MHz

F2 - Processing parameters
 SI 32768
 SF 500.020000 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

1D NMR plot parameters
 CX 19.50 cm
 F1P 12.407 ppm
 F1 6203.96 Hz
 F2P -1.018 ppm
 F2 -508.79 Hz
 CPD 0.68846 ppm/cm
 HZCM 344.24390 Hz/cm

Current Data Parameters
NAME CC-x-50pvr
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20030106
Time 13.26

INSTRUM spect

PROBHD 5 mm BBO BB-1

PULPROG zgpg30

TD 65536

SOLVENT CDCl3

VS 1024

DS 4

SWH 31446.541 Hz

FIDRES 0.479836 Hz

AQ 1.0420724 sec

RG 4096

DM 15.900 usec

DE 6.00 usec

TE 300.0 K

D1 2.00000000 sec

D11 0.03000000 sec

D12 0.00002000 sec

===== CHANNEL f1 =====
NUC1 13C
P1 13.00 usec
PL1 3.00 dB
SF01 125.7439093 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 100.00 usec
PL2 -1.00 dB
PL12 18.80 dB
PL13 18.80 dB
SF02 500.0220001 MHz

F2 - Processing parameters
SI 32768
SF 125.7300959 MHz
WDW EM
SSB 0
-B 1.00 Hz
GB 0
GC 1.40

1D NMR plot parameters
CX 19.50 cm
-1P 235.024 ppm
F1 29549.64 Hz
-1P -15.032 ppm
F2 -1889.99 Hz
PPMCM 12.82341 ppm/cm
HZCM 1612.28870 Hz/cm

Current Data Parameters
NAME CC-x-500yr-1phos
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20030106
Time 14.58

INSTRUM spect
PROBHD 5 mm BBO BB-1
PULPROG zgpg30
TD 65536
SOLVENT Pyr
NS 16
DS 4

SWH 64935.066 Hz
FIDRES 0.990830 Hz
AQ 0.5046772 sec
RG 9195.2

DM 7.700 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
d11 0.03000000 sec
d12 0.0002000 sec

===== CHANNEL f1 =====
NUC1 31P
P1 4.95 usec
PL1 -6.00 dB
SF01 161.9672941 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -6.00 dB
PL12 15.80 dB
PL13 15.80 dB
SF02 400.1316005 MHz

F2 - Processing parameters
SI 32768
SF 161.9753930 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters
CX 22.00 cm
F1P 100.000 ppm
F1 16197.54 Hz
F2P -180.000 ppm
F2 29155.57 Hz
F2 12.72727 ppm/cm
S1 50488 Hz/cm

Current Data Parameters
 NAME cc-x-53pyr
 EXPNO 1
 PROCNO 1

ppm

F2 - Acquisition Parameters
 Date_ 20030107
 Time 13.17

INSTRUM spect
 PROBHD 5 mm BBO BB-1
 PULPROG zg30
 ID 65536

SOLVENT Pyr

NS 16

DS 2

SWH 10330.578 Hz

FIDRES 0.157632 Hz

AQ 3.1719923 sec

RG 64

DW 48.400 usec

DE 6.00 usec

TE 300.0 K

Q1 1.00000000 sec

===== CHANNEL f1 =====

NUC1 1H

Q1 14.75 usec

PL1 -1.00 dB

SFO1 500.0230878 MHz

F2 - Processing parameters

SI 32768

SF 500.0200000 MHz

WDW EM

SSB 0

LB 0.30 Hz

GB 0

PC 1.00

1D NMR plot parameters

CX 19.50 cm

F1P 11.249 ppm

F1 5624.55 Hz

F2 -0.622 ppm

F2 -310.94 Hz

PPMCM 0.60874 ppm/cm

HZCM 304.38409 Hz/cm

Current Data Parameters
NAME CC-x-530yr-car
EXPNO 1
PROCNO 1

= 2 - Acquisition Parameters

Date_ 20030108
Time 12.29
INSTRUM spect
PROBHD 5 mm BBO BB-1
PULPROG zgpg30
TD 65536
SOLVENT PYC
NS 540
DS 4
SWH 25125.629 HZ
FIDRES 0.383387 HZ
AQ 1.3042164 sec
RG 8192
DM 19.900 usec
DE 6.00 usec
TE 300.0 K
J1 2.00000000 sec
d11 0.03000000 sec
d12 0.00002000 sec

===== CHANNEL f1 =====

NUC1 13C
P1 5.90 usec
PL1 -6.00 dB
SF01 100.6237959 MHz

===== CHANNEL f2 =====

CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -6.00 dB
PL12 15.80 dB
PL13 15.80 dB
SF02 400.1316005 MHz

= 2 - Processing parameters

SI 32768
SF 100.6128548 MHz
WDW EM
SSB 0
-B 1.00 HZ
GB 0
PC 1.40

ID NMR plot parameters

CX 19.50 cm
F1P 160.029 ppm
F1 16100.96 HZ
F2P -3.926 ppm
F2 -394.99 HZ
PPMCM 8.40794 ppm/cm
HZCM 845.94641 HZ/cm

Current Data Parameters
NAME cc-x-50pyr-dnos
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters

Date_ 20030106
Time 14.58
INSTRUM spect
PROBHD 5 mm BBO BB-1
PULPROG zgpg30
TD 65536
SOLVENT Pyr
NS 15
DS 4
SWH 64935.066 Hz
FIDRES 0.990330 Hz
AQ 0.5046772 sec
RG 9195.2
DM 7.700 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
d11 0.03000000 sec
d12 0.00002000 sec

===== CHANNEL f1 =====
NUC1 ³¹P
P1 4.95 usec
PL1 -6.00 dB
SF01 161.9672941 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 ¹H
PCPD2 80.00 usec
PL2 -6.00 dB
PL12 15.80 dB
PL13 15.80 dB
SF02 400.1316005 MHz

F2 - Processing parameters
SI 32768
SF 161.9753930 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters
CX 22.00 cm
F1P 150.457 ppm
F1 24370.28 Hz
F2P -250.438 ppm
F2 -40564.78 Hz
nu1 18.2248 ppm/cm
nu2 51.59375 Hz/cm

48.8217

```
Current Data Parameters
NAME          CC-X-58-1-26
EXPNO         1
PROCNO        1
```

5.2 - Acquisition Parameters

Date_	20030126
Time	22.10
INSTRUM	spect
PROBHD	5 mm BBO BB-1
PULPROG	zg30
TD	65536
SOLVENT	Pyr
NS	16
DS	2
SMH	10330.578 HZ
FIDPRES	0.157632 HZ
AQ	3.1719923 sec
RG	90.5
DM	48.400 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

```
===== CHANNEL f1 =====
```

NUC1	1H
p1	14.75 usec
PL1	-1.00 dB
SFO1	500.0230878 MHz

F2 - Processing parameters

SI	32768	
SF	500.0205681	MHz
MDW	EM	
SSB	0	
LB	0.30	Hz
GB	0	
PC	1.00	

1D NMR plot parameters

CX	19.50	cm
F1P	15.397	ppm
F1	7698.87	Hz
F2P	-5.263	ppm
F2	-2631.72	Hz
PPMCM	1.05950	ppm/cm
HZCM	529.77386	Hz/cm

Current Data Parameters
 NAME CC-x-58-1-26
 EXPNO 2
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20030126
 Time 22.16

INSTRUM spect
 PROBHD 5 mm BBO BB-1
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 10000
 DS 4
 SWH 31446.541 Hz
 FIDRES 0.479836 Hz
 AQ 1.0420724 sec
 RG 4096
 DM 15.900 usec
 DE 6.00 usec
 TE 300.0 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 D12 0.00002000 sec

===== CHANNEL f1 =====
 NUC1 13C
 P1 13.00 usec
 PL1 3.00 dB
 SF01 125.7439093 MHz

===== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 100.00 usec
 PL2 -1.00 dB
 PL12 18.80 dB
 PL13 18.80 dB
 SF02 500.0220001 MHz

F2 - Processing parameters
 SI 32768
 SF 125.7302407 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

1D NMR plot parameters
 CX 19.50 cm
 F1P 162.403 ppm
 F1 20418.99 Hz
 F2P -1.144 ppm
 F2 -143.81 Hz
 PPMCM 8.38702 ppm/cm
 HZCM 1054.50244 Hz/cm

Current Data Parameters
NAME CC-x-58pynnew
EXPNO 3
PROCNO 1

F2 - Acquisition Parameters

Date_ 20030116
Time 16.55
INSTRUM spect
PROBHD 5 mm BBO BB-1
PULPROG zgpg30
TD 65536
SOLVENT Aceton
NS 100
DS 4
SWH 80645.164 HZ
FIDRES 1.230548 HZ
AQ 0.4063732 sec
RG 4597.6
CW 6.200 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.0002000 sec

===== CHANNEL f1 =====

NUC1 31P
P1 10.75 usec
PL1 5.00 dB
SF01 202.4216766 MHz

===== CHANNEL f2 =====

CPDPRG2 waltz16
NUC2 1H
PCPD2 100.00 usec
PL2 -1.00 dB
PL12 18.80 dB
PL13 18.80 dB
SF02 500.0220001 MHz

F2 - Processing parameters

SF 32768
SF 202.4115560 MHz
WDW EM
SSB 0
LB 1.00 HZ
GB 0
PC 1.40

1D NMR plot parameters

CX 22.00 cm
F1P 100.000 ppm
F1 20241.16 HZ
F2P -180.000 ppm
F2 -36434.08 HZ
PPMCM 12.7277 ppm/cm
HZCM 2576.14697 HZ/cm

Current Data Parameters
 NAME CC-ix-36
 EXPNO 1
 PROCNO 1

ppm

F2 - Acquisition Parameters
 Date_ 20020719
 Time 11.08

INSTRUM spect
 PROBHD 5 mm QNP 1H/
 PULPROG zg30
 TD 16384
 SOLVENT CDCl3

NS 16
 DS 2
 SWH 5175.983 Hz
 FIDRES 0.315917 Hz
 AQ 1.5827444 sec

RG 287.4
 DW 96.600 usec
 DE 6.00 usec
 TE 300.0 K

D1 1.00000000 sec

===== CHANNEL f1 =====

NUC1 1H
 P1 7.20 usec
 PL1 -4.00 dB
 SFO1 250.1315447 MHz

F2 - Processing parameters

SI 32768
 SF 250.1300125 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

1D NMR plot parameters

CX 19.50 cm
 F1P 9.829 ppm
 F1 2458.62 Hz
 F2P -1.406 ppm
 F2 -351.59 Hz
 PPMCM 0.57615 ppm/cm
 HZCM 144.11334 Hz/cm

Current Data Parameters
NAME CC-1x-36
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters

Date_ 20020719
Time 11.10
INSTRUM spect
PROBHD 5 mm QNP 1H/
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 121
DS 4
SWH 15723.271 Hz
FIDRES 0.239918 Hz
AQ 2.0840948 sec
RG 16384
DM 31.800 usec
DE 30.00 usec
TE 300.0 K
D1 2.00000000 sec
d11 0.03000000 sec
d12 0.00002000 sec

===== CHANNEL f1 =====

NUC1 13C
P1 8.00 usec
PL1 0.00 dB
SF01 62.9021320 MHz

===== CHANNEL f2 =====

CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -4.00 dB
PL12 16.00 dB
PL13 17.00 dB
SF02 250.1310005 MHz

F2 - Processing parameters

SI 32768
SF 62.8952397 MHz
WDW EM
SSB 0
CB 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters

CX 19.50 cm
F1P 154.992 ppm
F1 9748.25 Hz
F2P -9.137 ppm
F2 -574.69 Hz
DPPCM 8.41688 ppm/cm
HZCM 529.38153 Hz/cm