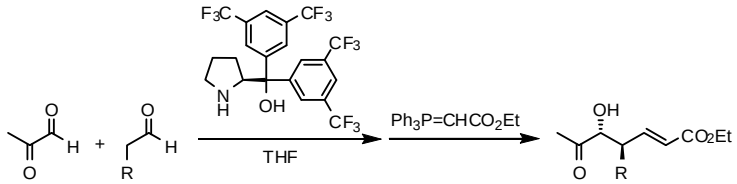
Supporting Information

General Remarks

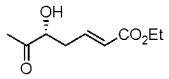
Pyruvic aldehyde (ca. 40 % in water), which was purchased from ACROS catalog number: 175791000 was used directly. All liquid aldehydes and solvents were distilled before use except pyruvic aldehyde. All reactions were monitored by thin-layer chromatography using Merck 60 F_{254} precoated silica gel plates (0.25 mm thickness). Preparative thin layer chromatography was performed using Wakogel B-5F purchased from Wako Pure Chemical Industries, Tokyo, Japan. Flash chromatography was performed using silica gel 60N of Kanto Chemical Co. Int., Tokyo Japan. FT-IR spectra were recorded on a JASCO FT/IR-410 spectrometer. ^{1}H and ^{13}C NMR spectra were recorded on a Bruker AM400 (400 MHz for ^{1}H NMR, 100 MHz for ^{13}C NMR) instrument. Data for ^{1}H NMR are reported as chemical shift (δ ppm), integration, multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet), coupling constant (Hz). Data for ^{13}C NMR are reported as chemical shift. High-resolution mass spectral analyses (HRMS) were carried out using Bruker ESI-TOF MS. HPLC analysis was performed on a HITACHI Elite LaChrom Series HPLC, UV detection monitored at appropriate wavelength respectively, using CHIRALPAK AD-H (0.46 cm x 25 cm), CHIRALPAK AS-H (0.46 cm x 25 cm), CHIRALCEL OD-H (0.46 cm x 25 cm), CHIRALPAK IA (0.46 cm x 25 cm) and CHIRALPAK IC (0.46 cm x 25 cm).

Typical procedure of aldol / Wittig reaction (Table 2)



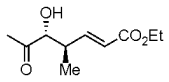
To pyruvic aldehyde (0.5 mmol, 75 μL, 40 wt% aqueous solution) in THF (0.50 mL, 1.0 M) were added (*S*)-2-[bis(3,5-bis-trifluoromethyl-phenyl)hydroxymethyl]pyrrolidine (26.3 mg, 0.05 mmol), and aldehyde (1.0 mmol). After stirring the reaction mixture for 12 hours at 23 ^{o}C, Wittig reagent (435 mg, 1.25 mmol) was added and reaction mixture was stirred for 2 hours at 23 ^{o}C. Upon completion, the Witttig reaction was quenched by passing through silica gel pad, and concentrated in vacuo. Purification by preparative thin layer chromatography (ethyl acetate : hexane = 1 : 6) gave corresponding α,β-unsaturated ester. The diastereomeric ratio was determined from crude NMR and is same after purification by column chromatography which was written in Table 2. Yields were reported after purification. After careful preparative thin layer chromatography, the *anti* and *syn* isomers were partially separated. The physical data were collected after the partial separation of major diastereomer (*anti* isomer) and these diastereomeric ratios are written in the following data. Enantiomeric excess of major diastereomer (*anti* isomer) was determined by HPLC equipped with chiral column. Racemic compound was obtained using (*S*)-2-[bis(3,5-bis-trifluoromethyl-phenyl)hydroxymethyl]pyrrolidine (13.2 mg, 0.025 mmol) and (*R*)-2-[bis(3,5-bis-trifluoromethyl-phenyl)hydroxymethyl]pyrrolidine (13.2 mg, 0.025 mmol) by following the identical procedure as described above.

(*R*,*E*)-ethyl 5-hydroxy-6-oxohept-2-enoate (table 2-entry 1)



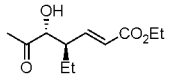
60% yield; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.28 (3H, t, *J* = 7.2 Hz), 2.23 (3H, s), 2.46-2.54 (1H, m), 2.77 (1H, ddq, *J* = 1.4, 7.6, 14.8 Hz), 4.18 (2H, q, *J* = 7.2 Hz), 4.32 (1H, dt, *J* = 4.8, 7.2 Hz), 5.94 (1H, dt, *J* = 1.4, 15.6 Hz), 6.90 (1H, dt, *J* = 7.6, 15.6 Hz); ^{13}C NMR($CDCl_3$, 100 MHz): 14.1, 25.4, 36.4, 60.6, 75.6, 124.9, 142.5, 166.3, 208.3;IR (neat): ν_{max} 3446, 2924, 1717, 1655, 1369, 1269, 1165, 1096, 1041, 981, 668, 701 cm^{-1}; HRMS (ESI): $[M+Na]^+$ calcd for $[C_9H_{14}NaO_4]^+$: 209.0784, found: 209.0792; $[\alpha]_D^{17}$ -19.5^o (c = 0.81, $CHCl_3$); Enantiomeric excess of major diastereomer (*anti* isomer) was determined after 3,5-dinitrobenzoylation of Wittig product by HPLC with a CHIRALCEL OD-H column (^{i}PrOH : hexane = 1 : 40), 1 mL/min, major enantiomer t_R = 37.5 min, minor enantiomer t_R = 56.4 min.

(4*R*,5*R*,*E*)-ethyl 5-hydroxy-4-methyl-6-oxohept-2-enoate (table 2-entry 2)



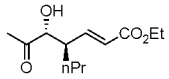
As diastereomer mixture (*anti* : *syn* =11 : 1); 84% yield; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.27 (3H, d, *J* = 6.8 Hz), 1.28 (3H, t, *J* = 7.2 Hz), 2.19 (3H, s), 2.84-2.91 (1H, m), 4.17 (2H, q, *J* = 7.2 Hz), 4.20 (1H, d, *J* = 6.8 Hz), 5.84 (1H, d, *J* = 15.6 Hz), 6.79 (1H, dd, *J* = 8.0, 15.6 Hz); ^{13}C NMR ($CDCl_3$, 100 MHz): 14.6, 16.8, 25.8, 40.1, 60.7, 80.2, 122.9, 146.9, 166.1, 208.2; IR (neat): ν_{max} 3467, 2979, 1716, 1654, 1459, 1369, 1276, 1181, 1035, 981 cm^{-1}; HRMS (ESI): $[M+Na]^+$ calcd for $[C_{10}H_{16}NaO_4]^+$: 223.0941, found: 223.0933; $[\alpha]_D^{17}$ -26.2^o (c = 0.57, $CHCl_3$); Enantiomeric excess of major diastereomer (*anti* isomer) was determined by HPLC with a CHIRALPAK IC column (^{i}PrOH : hexane = 1 : 30), 1 mL/min, minor enantiomer t_R = 33.9 min, major enantiomer t_R = 46.0 min.

(4*R*,5*R*,*E*)-ethyl 4-ethyl-5-hydroxy-6-oxohept-2-enoate (table 2-entry 4)



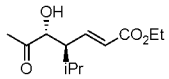
As diastereomer mixture (*anti* : *syn* = >20 : 1); 82% yield; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 0.98 (3H, t, *J* = 7.2 Hz), 1.28 (3H, t, *J* = 7.2 Hz), 1.61-1.82 (2H, m), 2.18 (3H, s), 2.49-2.56 (1H, m), 4.16 (2H, q, *J* = 7.2 Hz), 4.28 (1H, d, *J* = 1.6 Hz), 5.80 (1H, d, *J* = 15.6 Hz), 6.69 (1H, dd, *J* = 9.6, 15.6 Hz); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 11.9, 14.2, 24.6, 25.4, 47.2, 60.5 78.7, 123.8, 145.5, 165.7, 208.1; IR (neat): ν_{max} 3461, 2965, 1716, 1653, 1459, 1370, 1237, 1176, 1137, 1038, 990 cm^{-1}; HRMS (ESI): $[M+Na]^+$ calcd for $[C_{11}H_{18}NaO_4]^+$: 237.1097, found: 237.1089; $[\alpha]_D^{17}$ -38.6^o (c = 1.15, $CHCl_3$); Enantiomeric excess of major diastereomer (*anti* isomer) was determined by HPLC with a CHIRALPAK AD-H column (^{i}PrOH : hexane =1 :30), 1mL/min, major enantiomer t_R =26.1 min., minor enantiomer t_R =32.7 min.

(4*R*,5*R*,*E*)-ethyl 5-hydroxy-6-oxo-4-propylhept-2-enoate (table 2-entry 5)



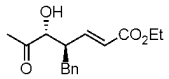
As diastereomer mixture (*anti* : *syn* = 14 : 1); 80% yield; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 0.94 (3H, t, *J* = 7.2 Hz), 1.27 (3H, t, *J* = 7.2 Hz), 1.33-1.39 (2H, m), 1.61-1.68 (2H, m), 2.18 (3H, s), 2.61-2.67 (1H, m), 4.17 (2H, q, *J* = 7.2 Hz), 4.25 (1H, dd, *J* = 2.4, 4.4 Hz), 5.79 (1H, d, *J* = 16.0 Hz), 6.70 (1H, dd, *J* = 9.6, 16.0 Hz); ^{13}C NMR ($CDCl_3$, 100 MHz): 13.7, 14.0, 20.3, 25.3, 33.4, 45.1. 60.3, 78.9, 123.4, 145.5, 165.6, 207.9; IR(neat): ν_{max} 3457, 2959, 1717, 1654, 1370, 1279, 1176, 1138, 1039, 990 cm^{-1}; HRMS (ESI): $[M+Na]^+$ calcd for $[C_{12}H_{20}O_4Na]^+$: 251.1254, found: 251.1257 ; $[\alpha]_D^{17}$ -81.1° (c = 1.02, $CHCl_3$); Enantiomeric excess was of major diastereomer (*anti* isomer) determined after 3,5-dinitrobenzoylation of Wittig product by HPLC with a CHIRALPAK IA column (^{i}PrOH : hexane = 1 : 50), 1 mL/min, major enantiomer t_R = 41.4 min, minor enantiomer t_R = 74.8 min.

(4*R*,5*R*,*E*)-ethyl 5-hydroxy-4-isopropyl-6-oxohept-2-enoate (table 2-entry 6)



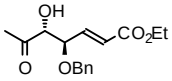
As diastereomer mixture (*anti* : *syn* = >20 : 1); 96% yield; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 0.91 (3H, d, *J* = 6.8 Hz), 1.11 (3H, d, *J* = 6.8 Hz), 1.27 (3H, t, *J* = 7.2 Hz), 1.97-2.07 (1H, m), 2.07-2.21 (1H, m), 2.15 (3H, s), 4.15 (2H, q, *J* = 7.2 Hz), 4.42 (1H, dd, *J* = 2.0, 4.4 Hz), 5.75 (1H, d, *J* = 16.0 Hz), 6.71 (1H, dd, *J* = 10.4, 16.0 Hz); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 14.1, 20.5, 21.2, 25.1, 28.6, 52.6, 60.4, 77.4, 123.9, 145.4, 165.5, 208.4; IR (neat): ν_{max} 3457, 2961, 1716, 1369, 1278, 1177, 1140, 1086, 1037, 994, 750 cm^{-1}; HRMS (ESI): $[M+Na]^+$ calcd for $[C_{12}H_{20}O_4Na]^+$: 251.1254, found: 251.1259; $[\alpha]_D^{17}$ -89.9° (c = 0.79, $CHCl_3$); Enantiomeric excess of major diastereomer (*anti* isomer) was determined by HPLC with a CHIRALPAK IC column (^{i}PrOH : hexane = 1 : 30), 1 mL/min, minor enantiomer t_R = 23.0 min, major enantiomer t_R = 45.0 min.

(4*R*,5*R*,*E*)-ethyl 4-benzyl-5-hydroxy-6-oxohept-2-enoate (table 2-entry 7)



As diastereomer mixture (*anti* : *syn* = >20 : 1); 79% yield; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.27 (3H, t, *J* = 7.2 Hz), 2.09 (3H, s), 2.84-2.92 (2H, m), 3.04 (1H, dt, *J* = 4.0, 11.0 Hz), 4.09 (1H, s), 4.16 (2H, q, *J* = 7.2 Hz), 5.78 (1H, d, *J* = 15.8 Hz), 6.79 (1H, dd, *J* = 9.0, 15.8 Hz), 7.22-7.34 (5H, m); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 14.1, 25.4, 37.8, 47.4, 60.3, 77.0, 123.7, 126.7, 128.7, 129.4, 138.0, 145.2, 165.3, 208.0, ; IR (neat): ν_{max} 3448, 1717, 1653, 1496, 1455, 1369, 1313, 1281, 1239, 1177, 1108, 1033, 989, 872, 740, 702, 683, 418 cm^{-1}; HRMS (ESI): $[M+Na]^+$ calcd for $[C_{16}H_{20}O_4Na]^+$: 299.1254, found: 299.1279; $[\alpha]_D^{22}$ -97.1° (c = 0.52, $CHCl_3$); Enantiomeric excess of major diastereomer (*anti* isomer) was determined by HPLC with a CHIRALPAK AD-H column (^{i}PrOH : hexane = 1 : 30), 1 mL/min, major enantiomer t_R = 16.1 min, minor enantiomer t_R = 23.2 min.

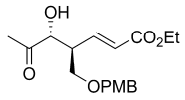
(4*R*,5*R*,*E*)-ethyl 4-benzyloxy-5-hydroxy-6-oxohept-2-enoate (table 2-entry 8)



Tri-n-butyl(carbethoxymethylidene)phosphorane was employed as a Wittig reagent instead of Tri-phenyl (carbethoxymethylidene)phosphorane.

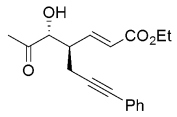
As diastereomer mixture (*anti* : *syn* = 2.8 : 1) ; 78% yield; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.31 (3H, t, *J* = 7.2 Hz), 2.23 (3H, s), 4.19-4.25 (3H, m), 4.31 (1H, d, *J* = 4.8 Hz), 4.46 (1H, d, *J* = 12.0 Hz), 4.65 (1H, d, *J* = 12.0 Hz), 6.13 (1H, d, *J* = 16.0 Hz), 6.94 (1H, dd, *J* = 6.0, 16.0 Hz), 7.28-7.36 (5H, m); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 14.2, 27.8, 60.7, 72.1, 78.9, 79.8, 124.5, 127.8, 128.0 128.5, 136.9, 143.3, 165.5, 207.3 ; IR (neat): ν_{max} 3448, 2985, 2924, 1712, 1365, 1273, 1180, 1095, 1034, 987, 741, 702 cm^{-1}; HRMS (ESI): $[M+Na]^+$ calcd for $[C_{16}H_{20}NaO_5]^+$: 315.1203, found: 315.1199; Enantiomeric excess of major diastereomer (*anti* isomer) was determined by HPLC with a CHIRALCEL OD-H column (^{i}PrOH : hexane = 1 : 50), 1 mL/min, minor enantiomer t_R = 35.4 min, major enantiomer t_R = 43.0 min.

(4*S*,5*R*,*E*)-ethyl 5-hydroxy-4-((4-methoxybenzyloxy)methyl)-6-oxohept-2-enoate (table 2-entry 9)



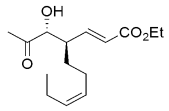
As diastereomer mixture (*anti* : *syn* = 7.5 : 1); 76% yield; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.27 (3H, t, *J* = 7.2 Hz), 2.17 (3H, s), 2.95-3.01 (1H, m), 3.56 (1H, dd, *J* = 5.6, 8.8 Hz), 3.72 (1H, dd, *J* = 8.4 Hz), 3.81 (3H, s), 4.16 (2H, q, *J* = 7.2 Hz), 4.48 (2H, dd, *J* = 11.6, 22.4 Hz), 5.88 (1H, d, *J* = 15.6 Hz), 6.72 (1H, dd, *J* = 9.0, 15.6 Hz), 7.29-7.41 (5H, m); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 14.2, 25.6, 45.6, 55.3, 60.5, 69.2, 73.2, 76.5, 113.8, 124.9, 129.4, 129.8, 142.1, 159.4, 165.6, 208.5; IR (neat): ν_{max} 3456, 2931, 1712, 1511, 1365, 1250, 1180, 1095, 1034, 818 cm^{-1}; $[\alpha]_D^{22}$ -41.7^o (c = 0.83, $CHCl_3$); HRMS (ESI): $[M+Na]^+$ calcd for $[C_{18}H_{24}NaO_6]^+$: 359.1465, found: 359.1465; Enantiomeric excess of major diastereomer (*anti* isomer) was determined by HPLC with a CHIRALPAK AS-H column (^{i}PrOH : hexane = 1 : 10), 1 mL/min, minor enantiomer t_R = 12.6 min, major enantiomer t_R = 18.1 min.

(*R*,*E*)-ethyl 4-((*R*)-1-hydroxy-2-oxopropyl)-7-phenylhept-2-en-6-ynoate (table 2-entry 10)



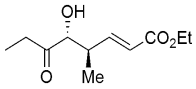
As diastereomer mixture (*anti* : *syn* = 14 : 1); 65% yield; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.28 (3H, t, *J* = 7.2 Hz), 2.23 (3H, s), 2.68 (1H, dd, *J* = 6.0, 16.4 Hz), 2.88 (1H, dd, *J* = 8.8, 16.4 Hz), 2.95-3.02 (1H, m), 4.18 (2H, q, *J* = 7.2 Hz), 4.58 (1H, dd, *J* = 2.4, 4.4 Hz), 5.92 (1H, d, *J* = 15.6 Hz), 6.73 (1H, dd, *J* = 9.0, 15.6 Hz), 7.29-7.41 (5H, m); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 14.4, 22.4, 25.5, 45.0, 60.7, 77.7, 83.3, 86.4, 124.6, 128.1, 128.3, 131.7, 143.4, 165.5, 207.8; IR (neat): ν_{max} 3460, 2924, 1717, 1654, 1491, 1370, 1280, 1173, 1032, 981, 758, 692 cm^{-1}; $[\alpha]_D^{18}$ -63.8^o (c = 0.85, $CHCl_3$); HRMS (ESI): $[M+Na]^+$ calcd for $[C_{18}H_{20}NaO_4]^+$: 323.1254, found: 323.1262; Enantiomeric excess of major diastereomer (*anti* isomer) was determined by HPLC with a CHIRALPAK IC column (^{i}PrOH : hexane = 1 : 30), 1 mL/min, minor enantiomer t_R = 33.7 min, major enantiomer t_R = 41.8 min.

(*R*,2*E*,7*Z*)-ethyl 4-((*R*)-1-hydroxy-2-oxopropyl)deca-2,7-dienoate (table 2-entry 11)



As diastereomer mixture (*anti* : *syn* = 11 : 1); 92% yield; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 0.96 (3H, t, *J* = 7.2 Hz), 1.27 (3H, t, *J* = 7.2 Hz), 1.67-1.82 (2H, m), 1.98-2.12 (4H, m), 2.17 (3H, s), 2.64-2.69 (1H, m), 4.16 (2H, q, *J* = 7.2 Hz), 4.24 (1H, dd, *J* = 2.0, 4.4 Hz), 5.27-5.46 (2H, m), 5.79 (1H, d, *J* = 16.0 Hz), 6.70 (1H, dd, *J* = 9.6, 16.0 Hz); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 14.1, 14.3, 20.6, 24.5, 25.3, 31.3, 44.6, 60.4, 78.8, 123.7, 127.5, 132.9, 145.3, 165.6, 207.9; IR (neat): ν_{max} 3446, 2933, 1718, 1450, 1370, 1280, 1162, 1095, 1038, 668 cm^{-1}; HRMS (ESI): $[M+Na]^+$ calcd for $[C_{15}H_{24}O_4Na]^+$: 291.1567, found: 291.1566; $[\alpha]_D^{16}$ -31.7^o (c = 0.47, $CHCl_3$); Enantiomeric excess of major diastereomer (*anti* isomer) was determined after 3,5-dinitrobenzoylation of Wittig product by HPLC with a CHIRALPAK AD-H column (^{i}PrOH : hexane = 1 : 30), 1 mL/min, major enantiomer t_R = 20.5 min, minor enantiomer t_R = 24.9 min.

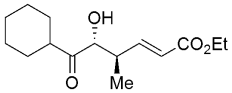
(4*R*,5*R*,*E*)-ethyl 5-hydroxy- 4-methyl -6-oxooct-2-enoate (table 2-entry 13)



2-oxo-butanal was prepared according to procedure A. This aldehyde was used for reaction as 17wt% aqueous solution.

As diastereomer mixture (*anti* : *syn* = >20 : 1); 80% yield; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.10 (3H, t, *J* = 7.2 Hz), 1.25 (3H, d, *J* = 7.2 Hz), 1.27 (3H, t, *J* = 7.2 Hz), 2.45 (2H, q, *J* = 7.2 Hz), 2.82-2.89 (1H, m), 4.16 (2H, q, *J* = 7.2 Hz), 4.19 (1H, d, *J* = 4.0 Hz), 5.81 (1H, d, *J* = 16.0 Hz), 6.78 (1H, dd, *J* = 8.0, 16.0 Hz); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 7.3, 14.1, 16.6, 31.7, 40.0, 60.4, 79.4, 122.6, 146.7, 165.9, 210.8; IR (neat): ν_{max} 3464, 2978, 2939, 2360, 1712, 1651, 1458, 1373, 1273, 1180, 1142, 1103, 1034 cm^{-1}; $[\alpha]_D^{23}$ -69.3^o (c = 0.75, $CHCl_3$); HRMS (ESI): $[M+Na]^+$ calcd for $[C_{11}H_{18}NaO_4]^+$: 237.1089, found: 237.1097; Enantiomeric excess of major diastereomer (*anti* isomer) was determined by HPLC with a CHIRALPAK IC column (^{i}PrOH : hexane = 1 : 10), 1 mL/min, minor enantiomer t_R = 10.4 min, major enantiomer t_R = 13.7 min.

(4*R*,5*R*,*E*)-ethyl 6-cyclohexyl-5-hydroxy-4-methyl-6-oxohex-2-enoate(table 2-entry 15)

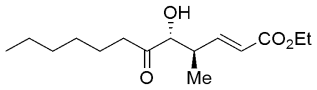


2-cyclohexyl-2-oxoacetaldehyde was prepared according to procedure B. This aldehyde was used for reaction with 12.2 eq. H_2O (table 2-entry14) or 6.1 eq. H_2O (table 2-entry15).

As diastereomer mixture (*anti* : *syn* = 20 : 1); 86% yield; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.26-1.30 (8H, m), 1.45-1.84 (8H, m), 2.49-2.55 (1H, m), 2.85-2.92 (1H, m), 4.17 (2H, q, *J* = 7.2 Hz), 4.32 (1H, d, *J* = 2.4 Hz), 5.80 (1H, d, *J* = 16.0 Hz), 6.78 (1H, dd, *J* = 8.0, 16.0 Hz) ; ^{13}C NMR ($CDCl_3$, 100 MHz): δ 14.2, 16.9, 25.0, 25.6, 25.9, 26.9, 30.1, 39.8, 46.5, 60.4, 70.8, 122.7, 146.9, 165.9, 213.4; IR (neat): ν_{max} 3456, 2931, 2854, 1712, 1651, 1450, 1373, 1304, 1273, 1180, 1034, 1003 cm^{-1}; $[\alpha]_D^{23}$ -50.8^o (c = 0.50, $CHCl_3$);

HRMS (ESI): $[M+Na]^+$ calcd for $[C_{15}H_{24}NaO_4]^+$: 291.1567, found: 291.1565; Enantiomeric excess of major diastereomer (*anti* isomer) was determined by HPLC with a CHIRALPAK IA column (^{i}PrOH : hexane = 1 : 30), 1 mL/min, minor enantiomer t_R = 11.3 min, major enantiomer t_R = 13.5 min.

(4*R*,5*R*,*E*)-ethyl 5-hydroxy-4-methyl-6-oxododec-2-enoate(table 2-entry 17)



2-oxo-octanal was prepared as per the literature procedure [a]. This aldehyde was used for reaction with 12.2 eq. H_2O (table 2-entry16) or 6.1 eq. H_2O (table 2-entry17).

As diastereomer mixture (*anti* : *syn* = 20 : 1); 74% yield; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 0.87 (3H, t, *J* = 7.2 Hz), 1.24-1.28 (12H, m), 1.56-1.61 (2H, m), 2.41 (2H, t, *J* = 7.2 Hz), 2.81-2.88 (1H, m), 4.13-4.18 (3H, m), 5.80 (1H, d, *J* = 16.0 Hz), 6.77 (1H, dd, *J* = 8.0, 16.0 Hz); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 13.9, 14.1, 16.7, 22.3, 23.3, 28.8, 31.4, 38.4, 39.9, 60.3, 79.5, 122.7, 146.7, 165.8, 210.4; IR (neat): ν_{max} 3448, 2931, 1712, 1651, 1458, 1373, 1273, 1180, 1034, 872, 725 cm^{-1}; $[\alpha]_D^{22}$ -31.3° (c = 0.69, $CHCl_3$); HRMS (ESI): $[M+Na]^+$ calcd for $[C_{15}H_{26}NaO_4]^+$: 293.1723, found: 293.1726; Enantiomeric excess of major diastereomer (*anti* isomer) was determined by HPLC with a CHIRALPAK IC column (^{i}PrOH : hexane = 1 : 30), 1 mL/min, minor enantiomer t_R = 19.4 min, major enantiomer t_R = 27.6 min.

Procedure A; Preparation of 2-oxo-butanal

This is a modified procedure by Rosowsky, A. et. al.[a] and Russell, G. A. et. al.[b].

To ethyl propionate (6.74 ml, 0.0587 mol) in DMSO (58.7 mL, 1 M) was added NaH (5.23 g, 0.117 mol) at 23 °C. After the reaction mixture was heated for 2 hours at 75 °C, the reaction was quenched by addition of ice water. After diethyl ether extraction to remove unreacted ester, the aqueous phase was cooled and acidified to pH 2 with 12 N HCl. The organic materials were extracted five times with chloroform, washed with water and brine, dried over anhydrous Na_2SO_4, and concentrated in vacuo.

The residue was dissolved in DMSO (22.5 mL, 2.6 M) and treated with 1.4 N HCl (196 mL, 0.3 M) at 23 °C. After stirring the reaction mixture for 24 hours at 23 °C, the organic materials were extracted three times with diethyl ether, washed with 5% aqueous $NaHCO_3$ solution and water, dried over anhydrous Na_2SO_4, and concentrated in vacuo.

The residue was dissolved in CH_2Cl_2 (29.4 mL, 2.0 M) and added $Cu(OAc)_2$ (5.88 g, 0.0294 mol) at 23 °C. After stirring the reaction mixture for 1 hour at 23 °C, it was filtered and then quenched by small portion of saturated aqueous $NaHCO_3$ solution. After evaporation of organic layer, extraction with water (5 mL) from organic materials gave 2-ethyl-2-oxoacetaldehyde as a 17wt% aqueous solution.

Procedure B; Preparation of 2-cyclohexyl-2-oxo-acetaldehyde

This is a modified procedure by Rosowsky, A. et. al.[a] and Russell, G. A. et. al.[b].

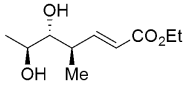
To methyl cyclohexanecarboxylate (10.2 mL, 0.07 mol) in DMSO (70.4 mL, 1 M) was added NaH (6.27

g, 0.14 mol) at 23 °C. After the reaction mixture was heated for 2 hours at 75 °C, the reaction was quenched by addition of ice water. After diethyl ether extraction to remove unreacted ester, the aqueous phase was cooled and acidified to pH 2 with 12 N HCl. The organic materials were extracted five times with chloroform, washed with water and brine, dried over anhydrous Na_2SO_4, and concentrated in vacuo.

The residue was dissolved in DMSO (26.9 mL, 2.6 M) and treated with 1.4 N HCl (233 mL, 0.3 M) at 23 °C. After stirring the reaction mixture for 24 hours at 23 °C, the organic materials were extracted three times with diethyl ether, washed with 5% aqueous $NaHCO_3$ solution and water, dried over anhydrous Na_2SO_4, and concentrated in vacuo.

The residue was dissolved in CH_2Cl_2 (35.0 mL, 2.0M) and added $Cu(OAc)_2$ (6.99 g, 0.035 mol) at 23 °C. After stirring the reaction mixture for 1 hour at 23 °C, it was filtered and then quenched by small portion of saturated aqueous $NaHCO_3$ solution. After evaporation of organic layer, The residue is distilled under reduced pressure to give 2-cyclohexyl-2-oxoacetaldehyde as a yellow oil.

(4*R*,5*R*,6*S*,*E*)-ethyl 5,6-dihydroxy-4-methylhept-2-enoate (Eq. 3)

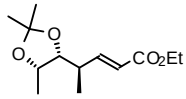


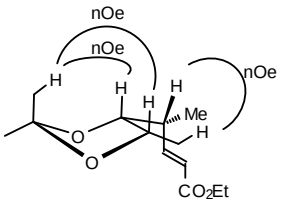
To (4*R*,5*R*,*E*)-ethyl 5-hydroxy-4-methyl-6-oxohept-2-enoate (34.6 mg, 0.17 mmol) as diastereomer mixture (*anti* : *syn* = 10 : 1) in THF (0.7 mL, 0.25 M) was added $Zn(BH_4)_2$ (1.5 ml, 0.5 M in THF) at 0 °C. After stirring the reaction mixture for 30 min at 0 °C, it was quenched by addition of water and then 10% HCl. The organic materials were extracted four times with chloroform, washed with saturated aqueous $NaHCO_3$ solution and brine, dried over anhydrous $MgSO_4$, and concentrated in vacuo after filtration. Purification by column chromatography (ethyl acetate : hexane = 1 : 2) gave (4*R*,5*R*,6*S*,*E*)-ethyl 5,6-dihydroxy-4-methylhept-2-enoate in 80% yield with *dr* = 10 : 1.

As diastereomer mixture (*dr* = 10 : 1); ^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.08 (3H, d, *J* = 6.8 Hz), 1.21 (3H, d, *J* = 6.4 Hz), 1.29 (3H, t, *J* = 7.2 Hz), 2.43-2.54 (1H, m), 3.48 (1H, dd, *J* = 4.8, 6.8 Hz), 3.85 (1H, dd, *J* = 4.8, 6.0 Hz), 4.19 (2H, q, *J* = 7.2 Hz), 5.85 (1H, d, *J* = 16.0 Hz), 6.97 (1H, dd, *J* = 8.0, 16.0 Hz); ^{13}C NMR ($CDCl_3$, 100MHz): δ 14.2, 16.0, 17.1, 38.9, 60.4, 68.4, 77.7, 122.0, 150.5, 166.7 ; IR(neat): ν_{max} 3417, 2970, 1705, 1651, 1458, 1373, 1281, 1188, 1041, 995, 771 cm^{-1}; HRMS (ESI): $[M+Na]^+$ calcd for $[C_{10}H_{18}NaO_4]^+$: 225.1097, found: 225.1088; $[\alpha]_D^{24}$ +10.5° (c = 0.44, $CHCl_3$).

(*R*,*E*)-ethyl 4-((4*R*,5*S*)-2,2,5-trimethyl-1,3-dioxolan-4-yl)pent-2-enoate

Determination of relative configuration of *anti*-reduction product.

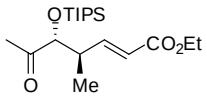




(4*R*,5*R*,6*S*,*E*)-ethyl 5,6-dihydroxy-4-methylhept-2-enoate (22.4 mg, 0.11 mmol) as diastereomer mixture (*anti* : *syn* = 10 : 1) was dissolved in CH_2Cl_2 (440 μL, 0.25 M) and treated with 2,2-dimethoxy-propane (16 μL, 0.13 mmol) and *p*-toluenesulfonic acid (2.1 mg, 0.011 mmol) at 23 °C. After stirring the reaction mixture for 30 min at 23 °C, it was quenched by addition of 5% aqueous $NaHCO_3$ solution. The organic materials were extracted three times with ethyl acetate, washed with brine, dried over unhydrous Na_2SO_4, and concentrated in vacuo. Purification by column chromatography (ethyl acetate : hexane = 1 : 4) gave (*R*,*E*)-ethyl 4-((4*R*,5*S*)-2,2,5-trimethyl-1,3-dioxolan-4-yl)pent-2-enoate in 89% yield with *anti* : *syn* = 10 : 1.

As single diastereomer; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.03 (3H, d, *J* = 6.8 Hz), 1.17 (3H, d, *J* = 6.4 Hz), 1.28 (3H, t, *J* = 7.2 Hz), 1.30 (3H, s), 1.42 (3H, s), 2.49 (1H, ddq, *J* = 6.8, 7.2, 8.4 Hz), 3.86 (1H, dd, *J* = 5.6, 8.4 Hz), 4.17 (2H, q, *J* = 7.2 Hz), 4.25 (1H, dq, *J* = 5.6, 6.4 Hz), 5.85 (1H, d, *J* = 16.0 Hz), 7.02 (1H, dd, *J* = 7.2, 16.0 Hz); ^{13}C NMR ($CDCl_3$, 100MHz): δ 13.9, 15.5, 16.1, 25.6, 28.0, 35.9, 59.9, 73.3, 80.6, 107.6, 120.7, 150.6, 166.4 ;IR(neat): ν_{max} 2985, 1720, 1651, 1458, 1373, 1250, 1180, 1065, 987, 856, 517 cm^{-1}; HRMS (ESI): $[M+Na]^+$ calcd for $[C_{13}H_{22}NaO_4]^+$: 265.1410, found: 265.1417; $[\alpha]_D^{24}$ +15.8° (c = 1.03, $CHCl_3$).

(4*R*,5*R*,*E*)-ethyl 4-methyl-6-oxo-5-(triisopropylsilyloxy)hept-2-enoate

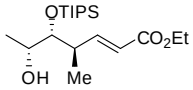


To (4*R*,5*R*,*E*)-ethyl 5-hydroxy-4-methyl-6-oxohept-2-enoate (261 mg, 1.31 mmol) as a diastereo mixture (*anti* : *syn* =10 : 1) in CH_2Cl_2 (2.6 ml, 0.5 M) were added TIPSOTf (0.52 ml, 1.96 mmol) and 2,6-lutidine (0.38 ml, 3.26 mmol) at 0 °C. After stirring the reaction mixture for 12 h at 23 °C, it was quenched by addition of saturated aqueous NH_4Cl solution. The organic materials were extracted three times with $CHCl_3$, washed with brine, dried over anhydrous Na_2SO_4, and concentrated in vacuo after filteration. Purification by column chromatography (ethyl acetate : chloroform= 1 : 40) gave (4*R*,5*R*,*E*)-ethyl 4-methyl-6-oxo-5-(triisopropylsilyloxy)hept-2-enoate in 38% yield with *anti* : *syn* = 10 : 1.

As single diastereomer; ^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.04-1.10 (24H, d, *J* = 6.8 Hz), 1.27 (3H, d, *J* = 7.2 Hz), 2.16 (3H, s), 2.58-2.67 (1H, m), 4.08 (1H, d, *J* = 4.8 Hz), 4.17 (2H, q, *J* = 7.2 Hz), 5.86 (1H, d, *J* = 16.0 Hz), 6.95 (1H, dd, *J* = 8.0, 16.0 Hz); ^{13}C NMR ($CDCl_3$, 100MHz): δ 12.3, 14.2, 14.7, 18.0, 26.1, 41.8, 60.3, 82.5, 122.0, 148.8, 166.2, 210.6 ;IR(neat): ν_{max} 2947, 2870, 1720, 1466, 1365, 1273, 1180, 1111, 1041, 987, 879, 818, 679 cm^{-1}; HRMS (ESI): $[M+Na]^+$ calcd

for $[C_{19}H_{36}NaO_4Si]^+$: 379.2275, found: 379.2288; $[\alpha]_D^{22}$ +15.1° (c = 0.77, $CHCl_3$).

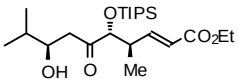
(4*R*,5*R*,6*R*,*E*)-ethyl 6-hydroxy-4-methyl-5-(triisopropylsilyloxy)hept-2-enoate (Eq. 4)



A single diastereomer of (4*R*,5*R*,*E*)-ethyl 4-methyl-6-oxo-5-(triisopropylsilyloxy)hept-2-enoate (31.5 mg, 0.088mmol) in toluene (0.9 ml, 0.1 M) was treated with sodium bis(2-methoxyethoxy) aluminum hydride (0.04 ml, 65 wt% in toluene) at -78 °C. After stirring the reaction mixture for 30 minute at -78 °C, it was quenched by addition of saturated aqueous solution of potassium sodium tartrate. The organic materials were extracted three times with $CHCl_3$, washed with brine, dried over anhydrous Na_2SO_4, and concentrated in vacuo after filtration. Purification by column chromatography (ethyl acetate : hexane = 1 : 4) gave (4*R*,5*R*,*E*)-ethyl 4-methyl-6-oxo-5-(triisopropylsilyloxy)hept-2-enoate in 94% yield.

^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.10-1.18 (27H, m), 1.17 (3H, t, *J* = 7.2 Hz), 2.64-2.67 (1H, m), 3.67-3.71 (2H, m), 4.19 (2H, q, *J* = 7.2 Hz), 5.83 (1H, d, *J* = 16.0 Hz), 6.99 (1H, dd, *J* = 7.2, 16.0 Hz); ^{13}C NMR ($CDCl_3$, 100MHz): δ 13.4, 14.3, 14.4, 18.2, 18.3, 21.0,
60.3, 67.7, 79.3, 121.4, 150.3, 166.6 ;IR(neat): ν_{max} 3487, 2939, 2870, 1720, 1651, 1466, 1373, 1265, 1095, 1041, 879, 679 cm^{-1}; HRMS (ESI): $[M+Na]^+$ calcd for $[C_{19}H_{38}NaO_4Si]^+$: 381.2432, found: 381.2435; $[\alpha]_D^{26}$ +7.0° (c = 1.31, $CHCl_3$).

(4*R*,5*R*,8*R*,*E*)-ethyl-8-hydroxy-4,9-dimethyl-6-oxo-5-(triisopropylsilyloxy)dec-2-enoate(Eq.5)



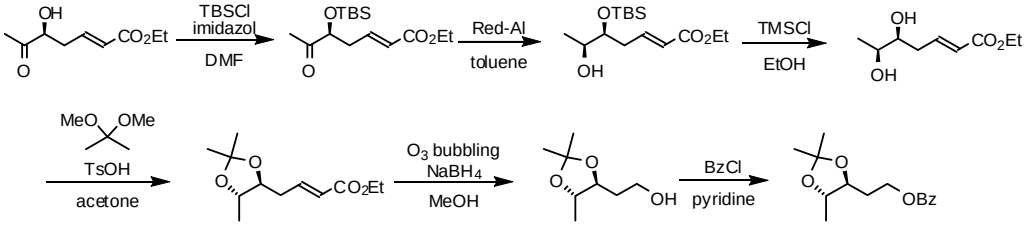
To (4*R*,5*R*,*E*)-ethyl 4-methyl-6-oxo-5-(triisopropylsilyloxy)hept-2-enoate (44.5 mg, 0.116 mmol) as a diastereo mixture (*anti* : *syn* =8.5 : 1) in CH_2Cl_2 (0.77 mL, 0.15 M), was added ^{i}Pr$_2$NEt (37 μL, 0.216 mmol) and ^{n}Bu$_2$BOTf (0.185 ml, 0.185 mol) at -78 °C. After stirring the reaction mixture for 3 hours at 0 °C, the reaction was cooled to -78 °C. Isobutyraldehyde (28 μL, 0.308 mmol) was added dropwise. After stirring the reaction mixture for 30 min at -78 to -20 °C, quenched by the addition of aqueous buffer (pH = 7). After separation, the aqueous layer was extracted with CH_2Cl_2. The combined organic layers were concentrated in vacuo, and the residue was dissolved in a mixture of MeOH (6 M of ketone), aqueous buffer (pH = 7) (6 M of ketone), and aqueous 30% H_2O_2 (30%, 3 M of ketone). The solution was stirred for 2 h, and after separation of the layers, the aqueous phase was extracted with CH_2Cl_2 and the combined organic layers. Organic layers were washed with satured aqueous $NaHCO_3$ and brine, dried over anhydrous $MgSO_4$, and concentrated in vacuo after filtration. Purification by preparative thin layer chromatography (ethyl acetate : hexane = 1 : 6) gave (4*R*,5*R*,8*R*,*E*)-ethyl-8-hydroxy-4,9-dimethyl-6-oxo-5-(triisopropyl-
silyloxy)dec-2-enoate in 70% yield with *anti* : *syn* = 14.3 : 1. Starting material was recovered 19% with

anti / *syn* = 5.6 / 1. Diastereomeric ratio decreased at purification stage due to isomerization.

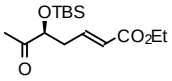
As diastereomer mixture (*anti* : *syn* = 4.0 : 1); ^{1}H NMR ($CDCl_3$, 400 MHz): δ 0.83 (3H, d, *J* = 6.8 Hz), 0.84 (3H, d, *J* = 6.8 Hz), 0.98-1.05 (24H, m), 1.22 (3H, t, *J* = 7.2 Hz), 1.60-1.66 (1H, m), 2.50 (1H, dd, *J* = 6.0, 18.4 Hz), 2.57-2.62 (1H, m), 2.66 (1H, dd, *J* = 2.0, 18.4 Hz), 3.65-3.69 (1H, m), 4.11 (2H, q, *J* = 7.2 Hz), 4.14 (1H, d, *J* = 4.8 Hz), 5.73 (1H, d, *J* = 15.6 Hz), 6.89 (1H, dd, *J* = 8.0, 15.6 Hz); ^{13}C NMR ($CDCl_3$,100MHz): δ 12.5, 14.2, 14.9, 17.9, 18.0, 32.9, 42.1, 42.3, 60.4, 71.6, 82.3, 122.0, 148.4, 166.1, 21 5.0 ;IR(neat): ν_{max} 4327, 3525, 2947, 2870, 1720, 1651, 1466, 1373, 1265, 1180, 1111, 1041, 995, 879, 8 18, 679, 579, 509 cm^{-1}; HRMS (ESI): $[M+Na]^+$ calcd for $[C_{23}H_{44}NaO_5Si]^+$: 451.2850, found: 451.2856.

Determination of relative and absolute configuration of aldol product

The absolute configuration was determined by comparison of the optical rotation after conversion of the aldol product into the known compound[c)], which was prepared according to Scheme 1.



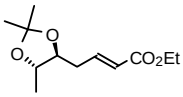
(*S*,*E*)-ethyl 5-(*tert*-butyldimethylsilyloxy)-6-oxohept-2-enoate



To (*S*,*E*)-ethyl 5-hydroxy-6-oxohept-2-enoate (405 mg, 2.17 mmol) in DMF (4.34 mL, 0.5 M) was added TBSCl (1.31 g, 8.68 mmol) and imidazole (739 mg, 10.85 mmol) at 0 °C. After stirring the reaction mixture for 1 h at 0 °C, it was quenched by addition of buffer (pH = 7.0). The organic materials were extracted three times with ethyl acetate, washed with water and brine, dried over anhydrous Na_2SO_4, and concentrated in vacuo. Purification by column chromatography (ethyl acetate : hexane = 1 : 10) gave (*S*,*E*)-ethyl 5-(*tert*-butyldimethylsilyloxy)-6-oxohept-2-enoate as a pale yellow oil in 86% yield.

^{1}H NMR ($CDCl_3$, 400 MHz): δ 0.06 (6H, s), 0.92 (9H, s), 1.27 (3H, t, *J* = 7.2 Hz), 2.17 (3H, s), 2.50 (2H, dd, *J* = 6.4, 7.2 Hz), 4.10 (1H, t, *J* = 6.4 Hz), 4.17 (2H, q, *J* = 7.2 Hz), 5.85 (1H, d, *J* = 15.6 Hz), 6.86 (1H, dt, *J* = 7.2, 15.6 Hz); ^{13}C NMR ($CDCl_3$, 100MHz): δ −5.1, −5.0, 14.2, 18.0, 25.6, 37.4, 60.2, 77.6, 124.5, 143.2, 165.9, 210.9 δ ;IR(neat): ν_{max} 2931, 2862, 1720, 1658, 1466, 1358, 1257, 1165, 1103, 1041, 987, 8 41,779 cm^{-1}; HRMS (ESI): $[M+Na]^+$ calcd for $[C_{15}H_{28}NaO_4Si]^+$: 323.1649, found: 323.1645; $[\alpha]_D^{22}$ -31.6° (c = 1.00, $CHCl_3$).

(*E*)-ethyl 4-((4*S*,5*S*)-2,2,5-trimethyl-1,3-dioxolan-4-yl)but-2-enoate



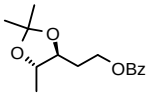
To (*S*,*E*)-ethyl 5-(*tert*-butyldimethylsilyloxy)-6-oxohept-2-enoate (97 mg, 0.323 mmol) in toluene (3.23 mL, 0.1 M) was added sodium bis(2-methoxyethoxy)aluminium hydride (147.7 μL, 65wt% in toluene) at -78 °C. After stirring the reaction mixture for 1 hat -78 °C, the reaction mixture was allowed to come to 23 °C. Reaction mixture was quenched by addition of saturated aqueous solution of potassium sodium tartrate at -78 °C. Organic materials were extracted three times with ethyl acetate, washed with brine, dried over unhydrous Na_2SO_4, and concentrated in vacuo.

The residue was dissolved in ethanol (323 μL, 1.0 M) and treated with trimethyl silyl chloride (6.1 μL, 0.05 mmol) at 23 °C. After stirring the reaction mixture for 8 h at 40 °C, it was concentrated in vacuo and the crude residue was forwarded for next step.

The crude residue was dissolved in acetone (323 μL, 1.0 M) and treated with 2,2-dimethoxy-propane (59.4 μL, 0.484 mmol) and *p*-toluenesulfonic acid (6.1 mg, 0.032 mmol) at 23 °C. After stirring the reaction mixture for 30 min at 23 °C, it was quenched by addition of 5% $NaHCO_3$ aqueous solution. The organic materials were extracted three times with ethyl acetate, washed with brine, dried over unhydrous Na_2SO_4, and concentrated in vacuo. Purification by column chromatography (ethyl acetate : hexane = 1 : 4) gave (*E*)-ethyl 4-((4*S*,5*S*)-2,2,5-trimethyl-1,3-dioxolan-4-yl)but-2-enoate as a pale yellow oil in 89% yield over three steps.

^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.24 (3H, d, *J* = 5.6 Hz), 1.27 (3H, t, *J* = 7.2 Hz), 1.36 (3H, s), 1.38 (3H, s), 2.41-2.46 (2H, m), 3.61-3.65 (1H, m), 3.71-3.77 (1H, m), 4.17 (2H, q, *J* = 7.2 Hz), 5.90 (1H, d, *J* = 15.6 Hz), 6.96 (1H, dt, *J* = 7.2, 15.6 Hz); ^{13}C NMR ($CDCl_3$,100MHz): δ 14.2, 17.3, 27.0, 27.2, 34.7, 60.2, 76.3, 80.5, 108.2, 123.7, 143.9, 166.1 ;IR(neat): ν_{max} 2985, 1720, 1658, 1450, 1373, 1265, 1219, 1180, 1095, 1041, 987, 856, 671 cm^{-1}; HRMS (ESI): $[M+Na]^+$ calcd for $[C_{12}H_{20}NaO_4]^+$: 251.1254, found: 251.1259; $[\alpha]_D^{24}$ -14.8° (c = 0.99, $CHCl_3$).

2-((4*S*,5*S*)-2,2,5-trimethyl-1,3-dioxolan-4-yl)ethyl benzoate



(*E*)-ethyl 4-((4*S*,5*S*)-2,2,5-trimethyl-1,3-dioxolan-4-yl)but-2-enoate (44 mg, 0.19 mmol) in MeOH (1.9 mL, 0.1 M) was cooled to -78 °C, and ozone was bubbled into the stirred solution. When the solution turned blue, ozone bubbling was stopped. Excess ozone was removed by purging with argon and then $NaBH_4$ (14 mg, 0.38 mmol) was added at 0 °C. After stirring the reaction mixture for 30 min at 0 °C, it was quenched by addition of buffer (pH = 7.0). Organic materials were extracted three times with chloroform, washed with brine, dried over unhydrous Na_2SO_4, and concentrated in vacuo.

The residue was dissolved in pyridine (190 μL, 1.0 M) and benzoyl chloride (37.4 μL, 0.29 mmol) was added at 0 °C. After stirring the reaction mixtuire for 2 hours at 23 °C, it was quenched by addition of buffer (pH = 7.0). The organic materials were extracted three times with ethyl acetate, washed with brine,

dried over unhydrous Na_2SO_4, and concentrated in vacuo. Purification by Preparative thin layer chromatography (acetone : hexane = 1 : 5) gave 2-((4*S*,5*S*)-2,2,5-trimethyl-1,3-dioxolan-4-yl)ethyl benzoate as a pale yellow oil in 59% yield over two steps.

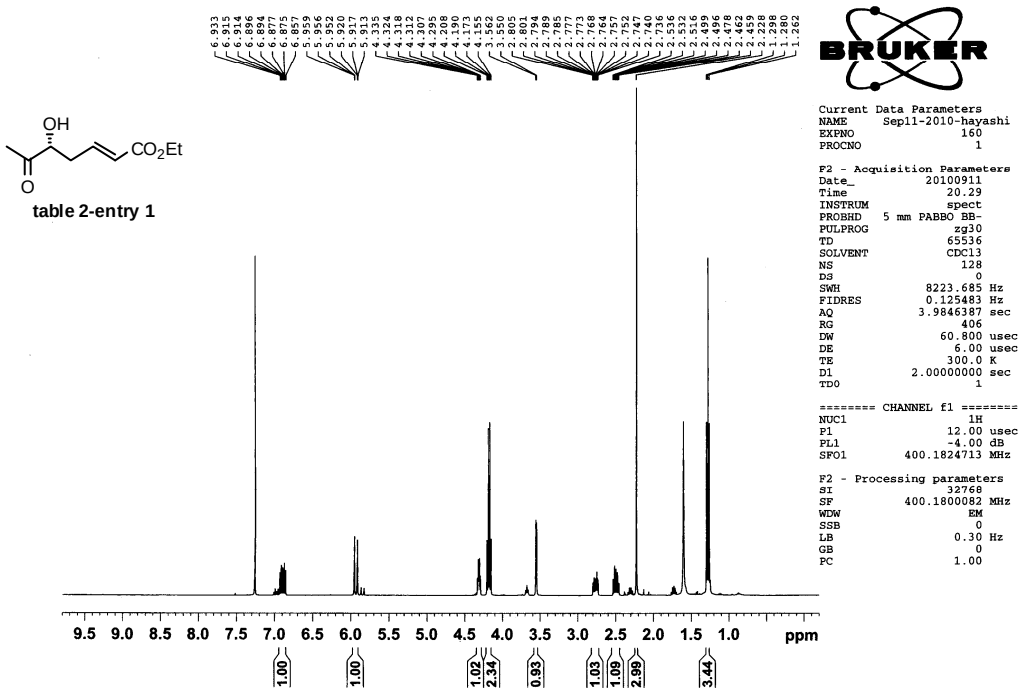
^{1}H NMR ($CDCl_3$, 400 MHz): δ 1.28 (3H, d, *J* = 6.0 Hz), 1.39 (3H, s), 1.40 (3H, s), 1.93-2.07 (2H, m), 3.67-3.83 (2H, m), 4.39-4.54 (2H, m), 7.42-8.04 (5H, m); ^{13}C NMR ($CDCl_3$,100MHz): δ 17.3, 27.2, 27.3, 31.5, 62.0, 79.3, 108.2, 128.4, 128.4, 129.6, 130.2, 133.0, 166.5 ;IR(neat): ν_{max} 2985, 2931, 1720, 1604, 1450, 1373, 1273, 1173, 1095, 1026, 1003, 856, 710, 517 cm^{-1}; HRMS (ESI): $[M+Na]^+$ calcd for $[C_{15}H_{20}NaO_4]^+$: 287.1254, found: 287.1247; $[\alpha]_D^{24}$ -24.5^o (c = 1.00, $CHCl_3$), lit [c] : -25.6^o (c = 4.95, $CHCl_3$)

Reference:

a) Rosowsky, A.; Chen, K. K. N. *J. Org. Chem.*, **1973**, *38*, 2073.

b) Mikol, G. J.; Russell, G. A. *Org. Synth.*, **1968**, *coll. Vol. 5*, 937.

c) Kochetkov, N. K.; Usov, A. I. *Tetrahedron*, **1963**, *19*, 973.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CO2Et
O
table 2-entry 1
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9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 ppm
1.00 1.00 1.02 2.34 0.93 1.03 1.09 2.99 3.44
BRUKER
Current Data Parameters
NAME Sep11-2010-hayashi
EXPNO 160
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100911
Time 20.29
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PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 128
DS 0
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 406
DW 60.800 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
TD0 1
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NUC1 1H
P1 12.00 usec
PL1 -4.00 dB
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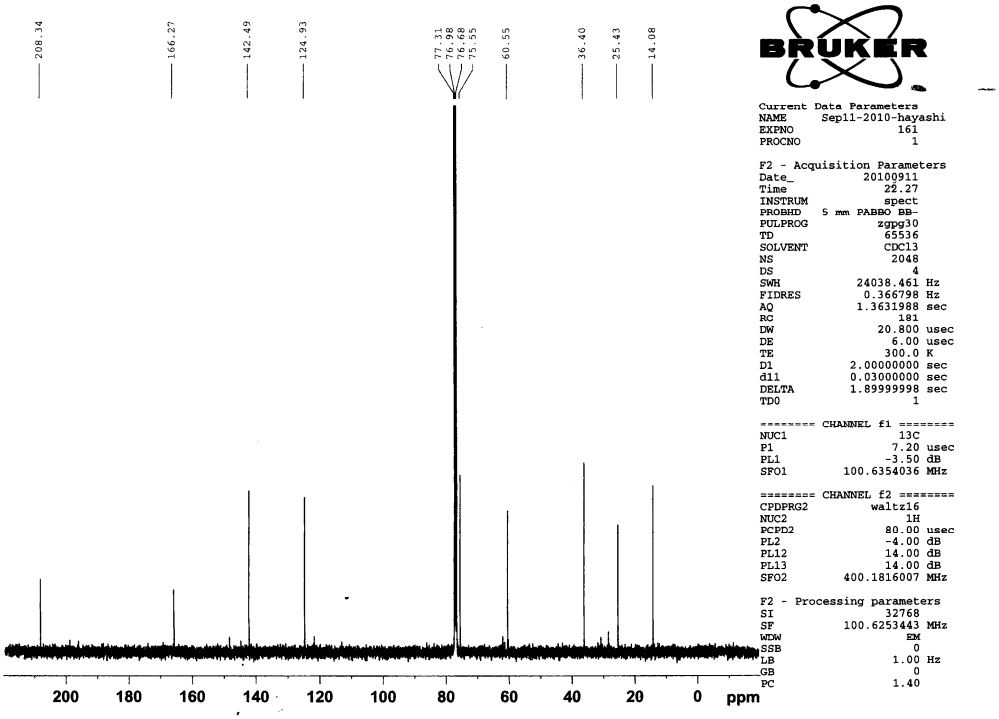
F2 - Processing parameters
SI 32768
SF 400.1800082 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00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BRUKER
Current Data Parameters
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EXPNO 161
PROCNO 1
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PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 2048
DS 4
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631988 sec
RG 181
DW 20.800 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
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NUC1 13C
P1 7.20 usec
PL1 -3.50 dB
SFO1 100.6354036 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -4.00 dB
PL12 14.00 dB
PL13 14.00 dB
SFO2 400.1816007 MHz
F2 - Processing parameters
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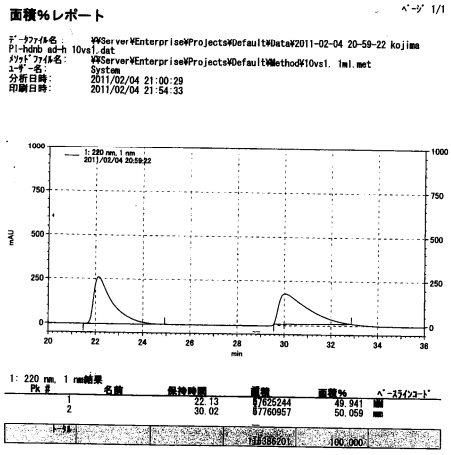
SF 100.6253443 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

面積％レポート



1: 220 nm, 1 nm結果

Pk #	名前	保持時間	面積	面積%	ベースラインコード
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トータル			15686201	100.000	

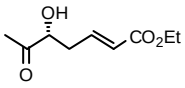
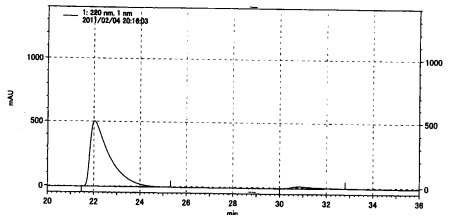


table 2-entry 1

面積％レポート



1: 220 nm, 1 nm結果

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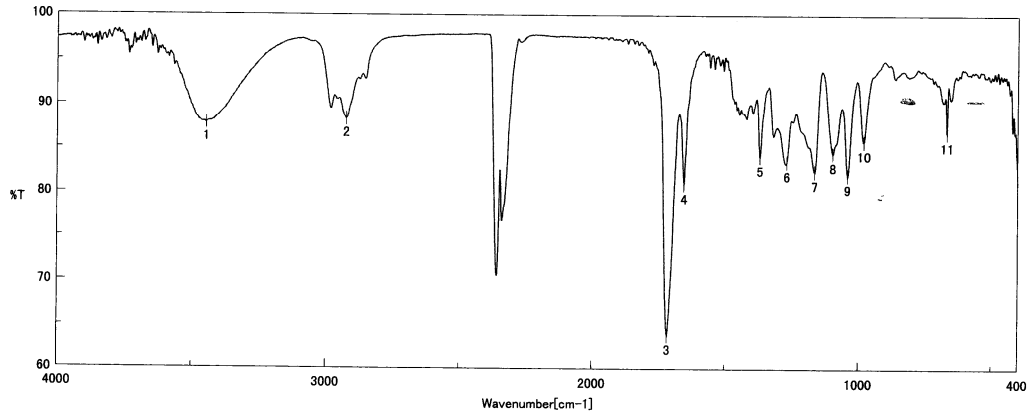
2		30.81	4200246	3.454	BB
トータル			121615024	100.000	

名前＝ name
保持時間＝ retention time
面積＝ area
ベースラインコード＝ base line code



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ゲイン	2
日時	110/12/27 17:20
測定者	
ファイル名	Memory#2
サンプル名	
コメント	

分解	4 cm-1
アポダイゼーション	Cosine
スキャンスピード	2 mm/sec

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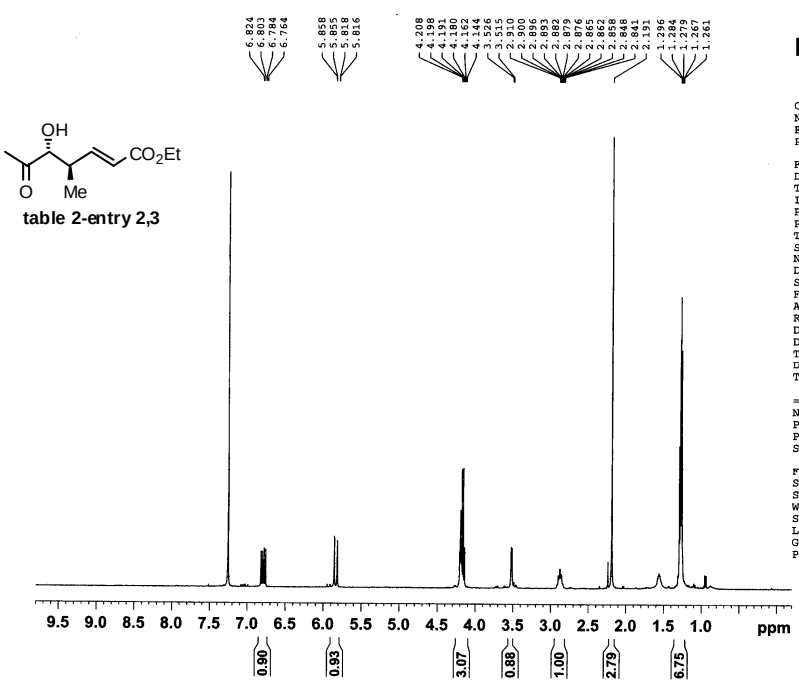
5:	1369.21,	84.0971	6:	1268.93,	83.5005	7:	1164.79,	82.4262	8:	1096.33,	84.4669
9:	1041.37,	82.0091	10:	980.63,	85.8045	11:	668.21,	86.7600			

積算回数＝ the number of accumulation
ゼロフィリング＝ zero filling
ゲイン＝ gain
日時＝ date
測定者＝ user name
ファイル名＝ file name
サンプル名＝ sample name
コメント＝ comment

分解＝ resolution
アポダイゼーション＝ apodization
スキャンスピード＝ scan speed



BRUKER

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NAME        Jan21-2011-hayashi
EXPNO                      110
PROCNO                       1

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Date_                 20110121
Time                     13.40
INSTRUM                  spect
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PULPROG                  zg30
TD                      65536
SOLVENT                 CDCl3
NS                         16
DS                          2
SWH                  8223.685 Hz
FIDRES               0.125483 Hz
AQ                   3.9846387 sec
RG                        645
DW                     60.800 usec
DE                      6.00 usec
TE                     296.9 K
D1                  1.00000000 sec
TD0                         1

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NUC1                       1H
P1                      13.00 usec
PL1                     -3.40 dB
SFO1                400.1824713 MHz

F2 - Processing parameters
SI                        32768
SF                  400.1800079 MHz
WDW                          EM
SSB                           0
LB                       0.30 Hz
GB                            0
PC                         1.00
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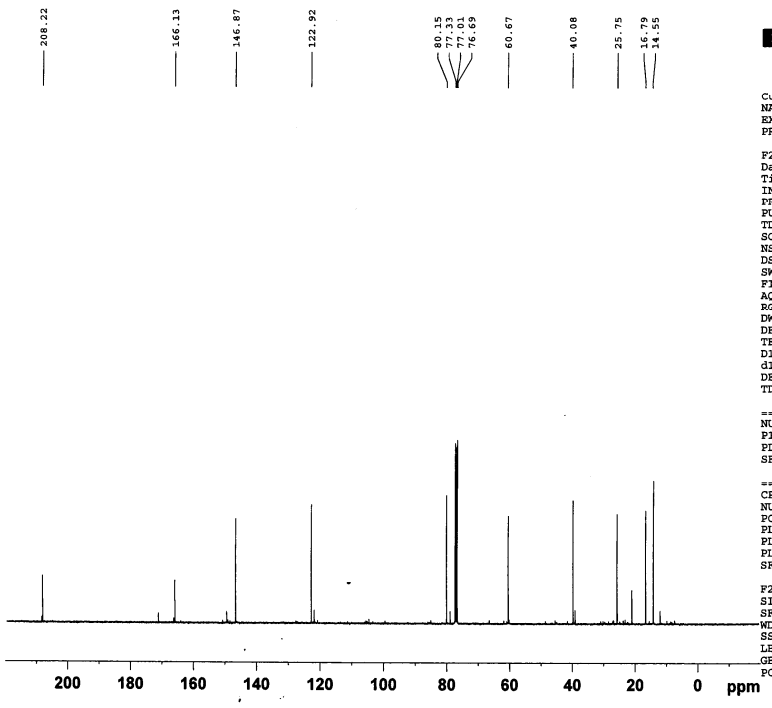

BRUKER

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Current Data Parameters
NAME       Sep24-2010-hayashi
EXPNO                      192
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20100924
Time                     23.49
INSTRUM                  spect
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PULPROG                zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                        1024
DS                           4
SWH                 24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631988 sec
RG                         256
DW                     20.800 usec
DE                      6.00 usec
TE                     300.0 K
D1                  2.00000000 sec
d11                 0.03000000 sec
DELTA               1.89999998 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                      13C
P1                      7.10 usec
PL1                     -3.50 dB
SFO1                100.6354036 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                  80.00 usec
PL2                     -1.50 dB
PL12                    13.00 dB
PL13                    13.00 dB
SFO2                400.1816007 MHz

F2 - Processing parameters
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SF                  100.6253459 MHz
WDW                          EM
SSB                           0
LB                       1.00 Hz
GB                            0
PC                         1.40
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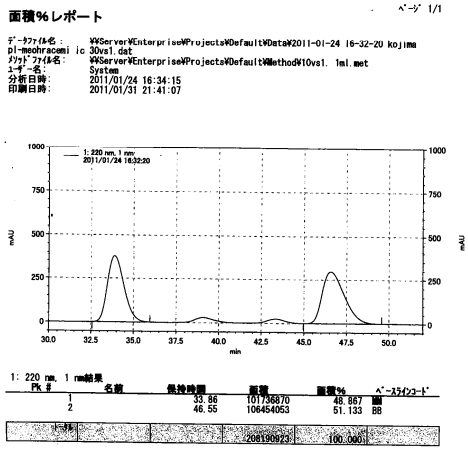
面積％レポート

ページ 1/1

データファイル名： ¥¥Server¥Enterprise¥Projects¥Default¥Data¥2011-01-24 16-32-20 kojima
pl-meohracemi ic 30vs1.dat
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ユーザー名： System
分析日時： 2011/01/24 16:34:15
印刷日時： 2011/01/31 21:41:07

1: 220 nm, 1 nm結果

Pk #	名前	保持時間	面積	面積%	ベースラインコード
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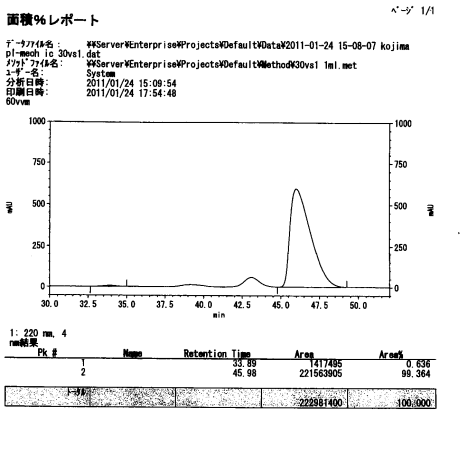
面積％レポート

ページ 1/1

データファイル名： ¥¥Server¥Enterprise¥Projects¥Default¥Data¥2011-01-24 15-08-07 kojima
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ユーザー名： System
分析日時： 2011/01/24 15:09:54
印刷日時： 2011/01/24 17:54:48
60vvm

1: 220 nm, 4 nm結果

Pk #	Name	Retention Time	Area	Area%
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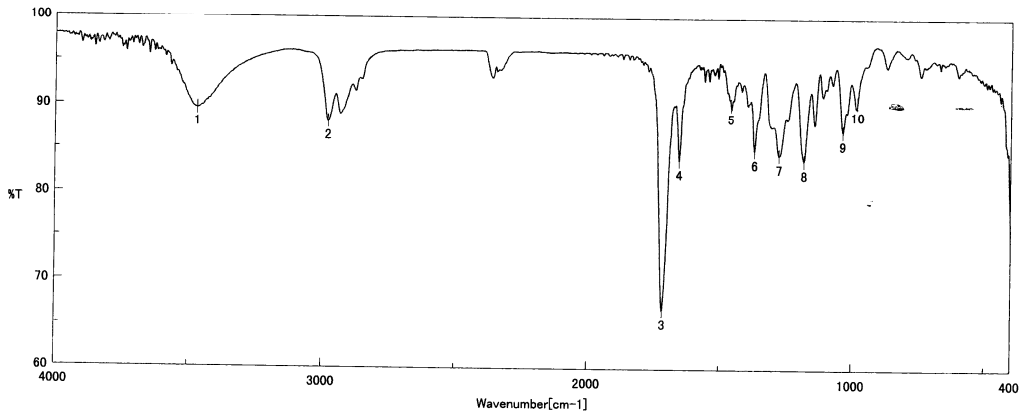
トータル			222981400	100.000



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ゲイン	2
日時	110/12/27 17:36
測定者	
ファイル名	Memory#2
サンプル名	
コメント	

分解	4 cm-1
アポダイゼーション	Cosine
スキャンスピード	2 mm/sec

1: 3467.38, 89.6261	2: 2979.48, 88.1640	3: 1716.34, 66.8341
4: 1653.66, 83.9056	5: 1458.89, 90.2639	6: 1369.21, 85.0137
7: 1275.68, 84.5462	8: 1181.19, 83.8947	9: 1034.62, 87.2201
10: 980.63, 90.5760		

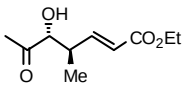
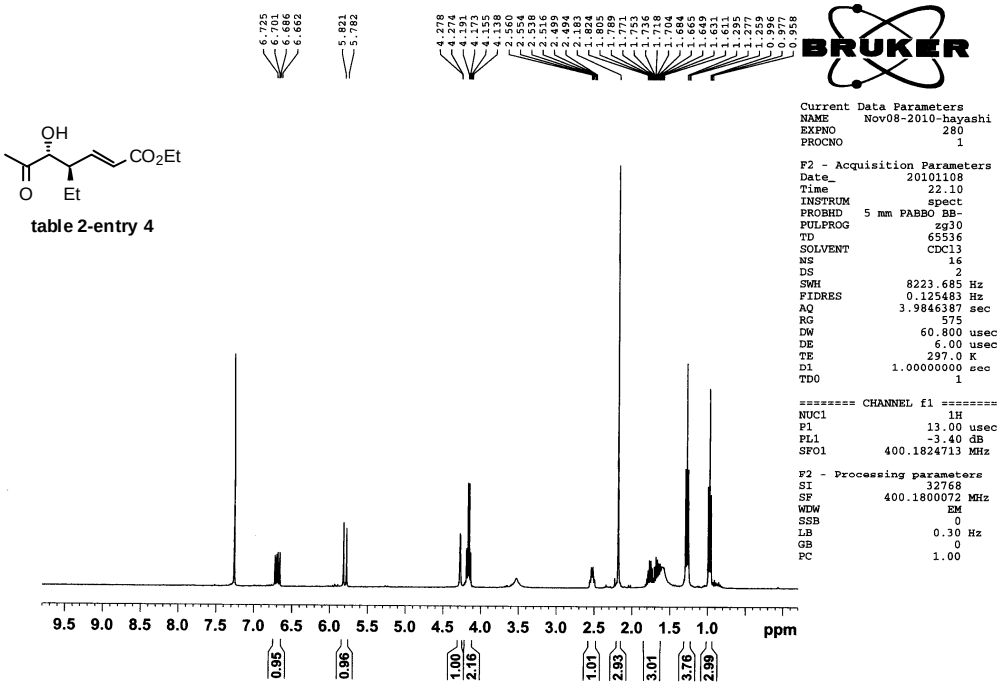


table 2-entry 2,3


OH
CO2Et
O
Et
table 2-entry 4
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5.821 5.782
4.278 4.274 4.191 4.173 4.155 4.138
2.560 2.554 2.538 2.516 2.499 2.494 2.183 1.804 1.805 1.789 1.771 1.753 1.736 1.718 1.704 1.684 1.665 1.649 1.631 1.611 1.295 1.277 1.259 0.976 0.957 0.958
BRUKER
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NAME Nov08-2010-hayashi
EXPNO 280
PROCNO 1
F2 - Acquisition Parameters
Date_ 20101108
Time 22.10
INSTRUM spect
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PULPROG zg30
TD 65536
SOLVENT CDCl3
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DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 575
DW 60.800 usec
DE 6.00 usec
TE 297.0 K
D1 1.00000000 sec
TD0 1
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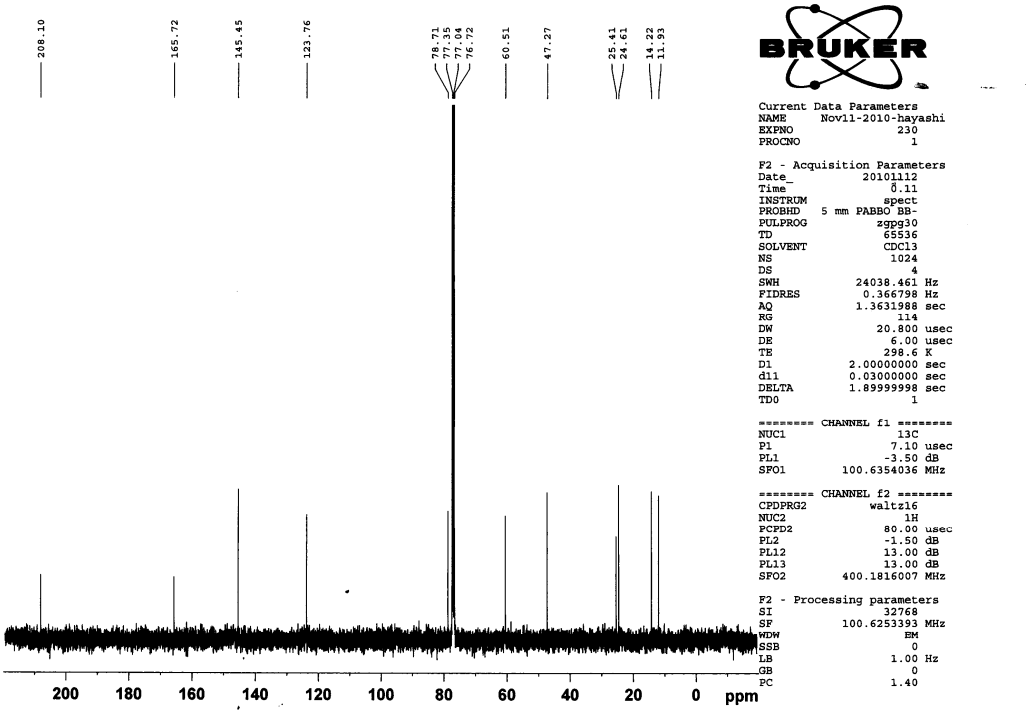
PL1 -3.40 dB
SFO1 400.1824713 MHz
F2 - Processing parameters
SI 32768
SF 400.1800072 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 ppm
0.95 0.96 1.00 2.16 1.01 2.93 3.01 3.76 2.99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165.72
145.45
123.76
78.71 77.35 77.04 76.72
60.51
47.27
25.41 24.61
14.22 11.93
BRUKER
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EXPNO 230
PROCNO 1
F2 - Acquisition Parameters
Date_ 20101112
Time 0.11
INSTRUM spect
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PULPROG zgpg30
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SOLVENT CDCl3
NS 1024
DS 4
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631988 sec
RG 114
DW 20.800 usec
DE 6.00 usec
TE 298.6 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 7.10 usec
PL1 -3.50 dB
SFO1 100.6354036 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -1.50 dB
PL12 13.00 dB
PL13 13.00 dB
SFO2 400.1816007 MHz
F2 - Processing parameters
SI 32768
SF 100.6253393 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
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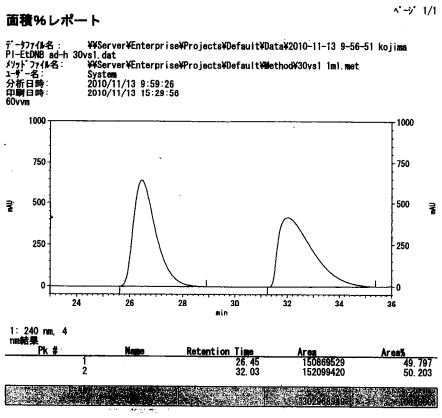
200 180 160 140 120 100 80 60 40 20 0 ppm



面積%レポート

ページ 1/1

データファイル名 : ¥¥Server¥Enterprise¥Projects¥Default¥Data¥2010-11-13 9-56-51 kojima
PI-EtDNB ad-h 30vs1.dat
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ユーザー名 : System
分析日時 : 2010/11/13 9:59:26
印刷日時 : 2010/11/13 15:29:56
60vvm

1: 240 nm, 4 nm結果

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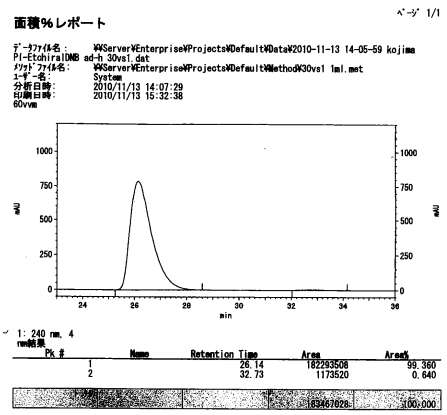

面積%レポート

ページ 1/1

データファイル名 : ¥¥Server¥Enterprise¥Projects¥Default¥Data¥2010-11-13 14-05-59 kojima
PI-EtchiralDNB ad-h 30vs1.dat
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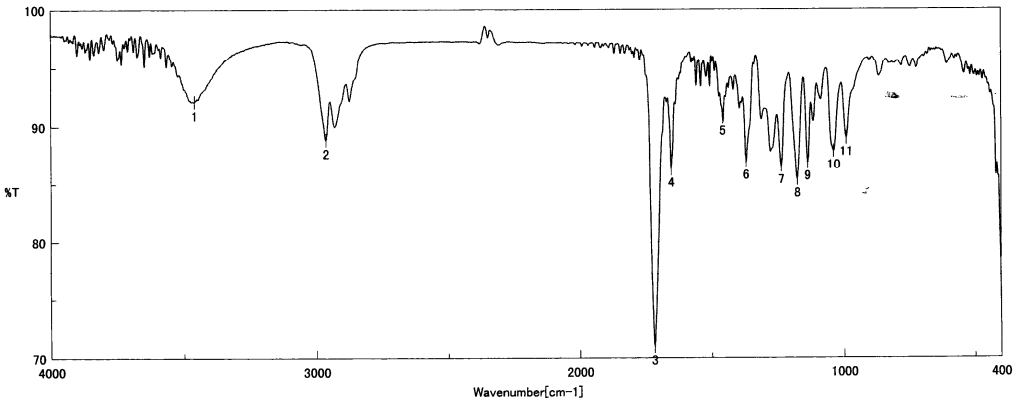
ユーザー名 : System
分析日時 : 2010/11/13 14:07:29
印刷日時 : 2010/11/13 15:32:38
60vvm

1: 240 nm, 4 nm結果

Pk #	Name	Retention Time	Area	Area%
1		26.14	182293508	99.360
2		32.73	1173520	0.640



積算回数	16	分解	4 cm-1
ゼロフィリング	ON	アポダイゼーション	Cosine
ゲイン	1	スキャンスピード	2 mm/sec
日時	110/12/27 17:52		
測定者			
ファイル名	Memory#2		
サンプル名			
コメント			

1:	3461.60,	92.1086	2:	2965.02,	88.8592	3:	1716.34,	71.0114	4:	1652.70,	86.3416
5:	1458.89,	90.8123	6:	1370.18,	87.0107	7:	1237.11,	86.5950	8:	1176.36,	85.4421
9:	1136.83,	86.9179	10:	1038.48,	87.8894	11:	990.27,	89.0207			

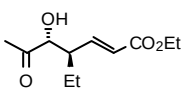


table 2-entry 4

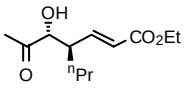
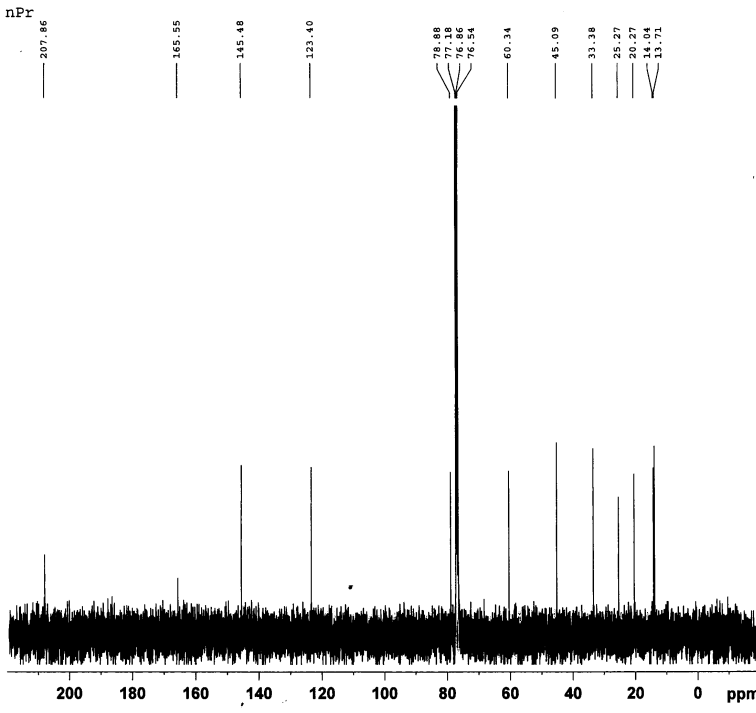
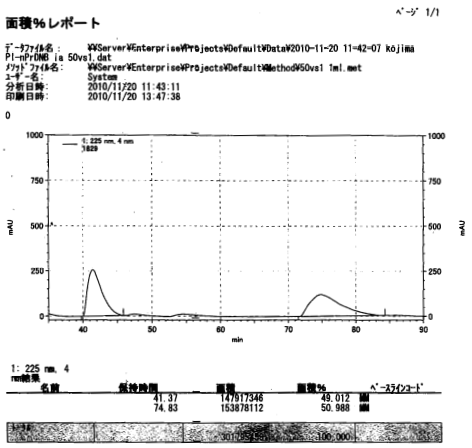


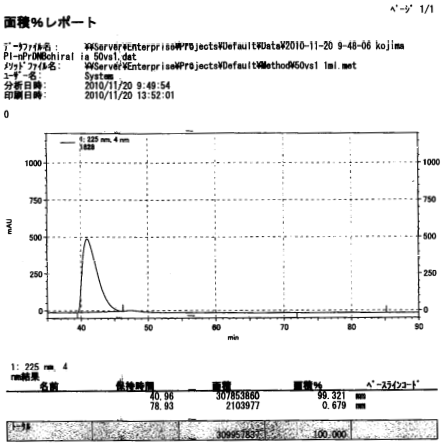
table 2-entry 5

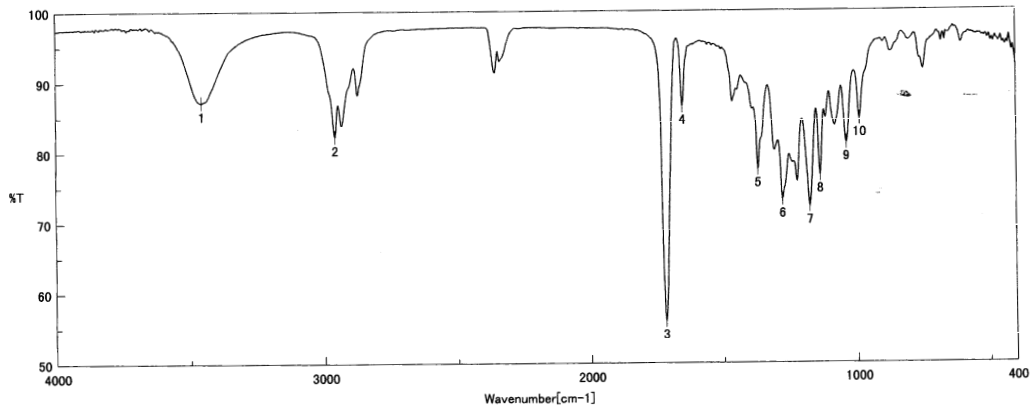
```
Current Data Parameters
NAME      Nov12-2010-hayashi
EXPNO                    120
PROCNO                     1

F2 - Acquisition Parameters
Date_              20101112
Time                  15.59
INSTRUM               spect
PROBHD   5 mm PABBO BB-
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH               8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                     512
DW                60.800 usec
DE                 6.00 usec
TE                 296.8 K
D1             1.00000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                    1H
P1                  13.00 usec
PL1                 -3.40 dB
SFO1          400.1824713 MHz

F2 - Processing parameters
SI                   32768
SF            400.1800090 MHz
WDW                     EM
SSB                      0
LB                  0.30 Hz
GB                       0
PC                    1.00
```



```
Current Data Parameters
NAME      Nov12-2010-hayashi
EXPNO                    220
PROCNO                     1

F2 - Acquisition Parameters
Date_              20101113
Time                   3.51
INSTRUM               spect
PROBHD   5 mm PABBO BB-
PULPROG            zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    1024
DS                       4
SWH              24038.461 Hz
FIDRES           0.366798 Hz
AQ               1.3631988 sec
RG                    50.8
DW                20.800 usec
DE                 6.00 usec
TE                 298.5 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                   13C
P1                  7.10 usec
PL1                 -3.50 dB
SFO1          100.6354036 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                    1H
PCPD2              80.00 usec
PL2                 1.50 dB
PL12               13.00 dB
PL13               13.00 dB
SFO2          400.1816007 MHz

F2 - Processing parameters
SI                   32768
SF            100.6253567 MHz
WDW                     EM
SSB                      0
LB                  1.00 Hz
GB                       0
PC                    1.40
```


面積%レポート


面積%レポート



積算回数	16
ゼロフィリング	ON
ゲイン	2
日時	110/12/27 17:06
測定者	
ファイル名	Memory#3
サンプル名	
コメント	

分解	4 cm-1
アポダイゼーション	Cosine
スキャンスピード	2 mm/sec

1:	3456.78,	87.2079	2:	2959.23,	82.2950	3:	1717.30,	56.0781	4:	1653.66,	86.5142
5:	1370.18,	77.5501	6:	1278.57,	73.2222	7:	1176.36,	72.3240	8:	1137.80,	76.7473
9:	1039.44,	81.2533	10:	990.27,	84.6444						

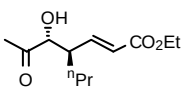
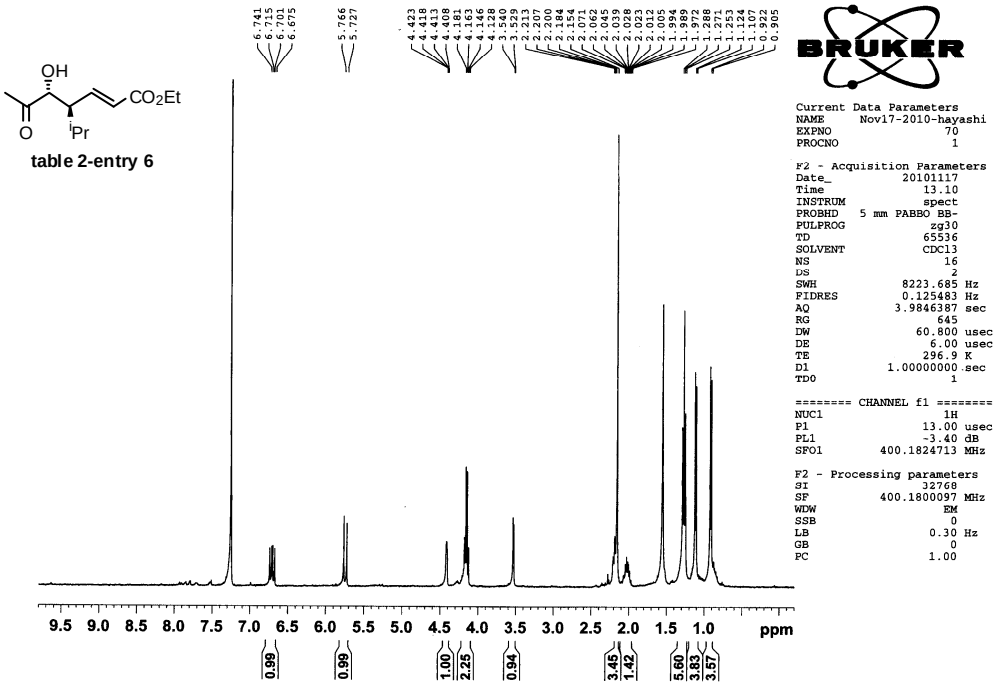
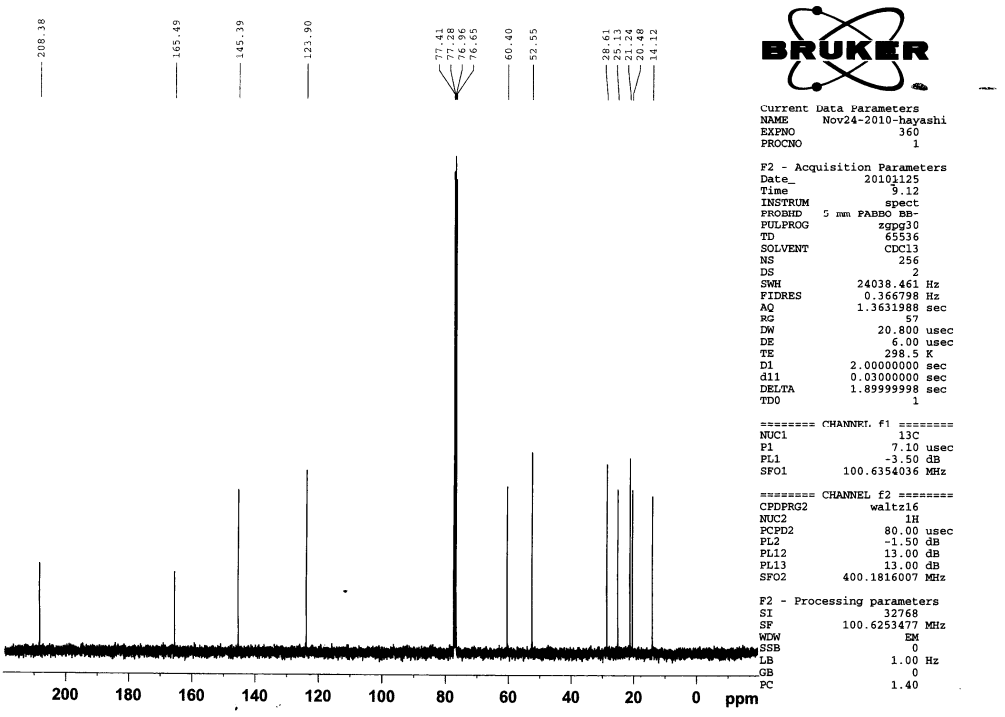
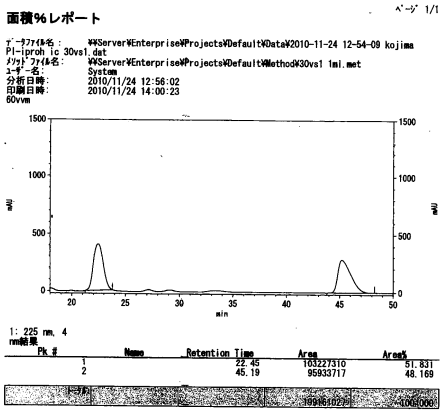


table 2-entry 5


OH
CO2Et
O
iPr
table 2-entry 6
6.741
6.715
6.701
6.675
5.766
5.727
4.423
4.418
4.413
4.408
4.181
4.163
4.146
4.128
4.120
3.529
3.213
2.207
2.200
2.184
2.154
2.071
2.062
2.045
2.039
2.028
2.023
2.012
2.005
1.984
1.980
1.972
1.288
1.271
1.253
1.134
1.107
0.922
0.905
BRUKER
Current Data Parameters
NAME Nov17-2010-hayashi
EXPNO 70
PROCNO 1
F2 - Acquisition Parameters
Date_ 20101117
Time 13.10
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 645
DW 60.800 usec
DE 6.00 usec
TE 296.9 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 13.00 usec
PL1 -3.40 dB
SFO1 400.1824713 MHz
F2 - Processing parameters
SI 32768
SF 400.1800097 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0
ppm
0.99
0.99
1.00
2.25
0.94
3.45
1.42
5.60
3.83
3.57


208.38
165.49
145.39
123.90
77.41
77.28
76.96
76.65
60.40
52.55
28.61
25.13
21.24
20.48
14.12
BRUKER
Current Data Parameters
NAME Nov24-2010-hayashi
EXPNO 360
PROCNO 1
F2 - Acquisition Parameters
Date_ 20101125
Time 9.12
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 256
DS 2
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631988 sec
RG 57
DW 20.800 usec
DE 6.00 usec
TE 298.5 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 7.10 usec
PL1 -3.50 dB
SFO1 100.6354036 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -1.50 dB
PL12 13.00 dB
PL13 13.00 dB
SFO2 400.1816007 MHz
F2 - Processing parameters
SI 32768
SF 100.6253477 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
200 180 160 140 120 100 80 60 40 20 0
ppm


面積%レポート

ﾍﾟｰｼﾞ 1/1

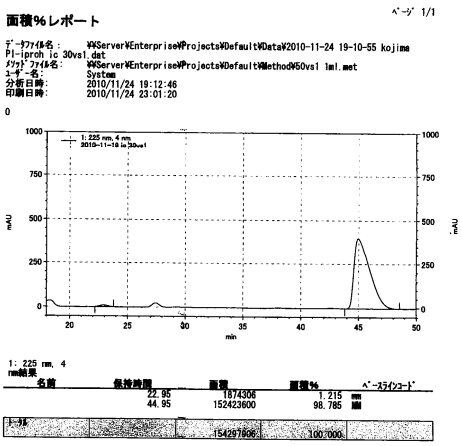
ﾃﾞｰﾀﾌｧｲﾙ名： ¥¥Server¥Enterprise¥Projects¥Default¥Data¥2010-11-24 12-54-09 kojima PI-iproh ic 30vs1.dat
ﾒｿｯﾄﾞﾌｧｲﾙ名： ¥¥Server¥Enterprise¥Projects¥Default¥Method¥30vs1 1ml.met
ﾕｰｻﾞｰ名： System
分析日時： 2010/11/24 12:56:02
印刷日時： 2010/11/24 14:00:23
60vvm

mAU

min

1: 225 nm, 4 nm

Pk #	Name	Retention Time	Area	Area%
1		22.45	163227310	51.831
2		45.19	95933717	48.169
Total			199161027	100.000


面積%レポート

ﾍﾟｰｼﾞ 1/1

ﾃﾞｰﾀﾌｧｲﾙ名： ¥¥Server¥Enterprise¥Projects¥Default¥Data¥2010-11-24 19-10-55 kojima PI-iproh ic 30vs1.dat
ﾒｿｯﾄﾞﾌｧｲﾙ名： ¥¥Server¥Enterprise¥Projects¥Default¥Method¥50vs1 1ml.met
ﾕｰｻﾞｰ名： System
分析日時： 2010/11/24 19:12:46
印刷日時： 2010/11/24 23:01:20

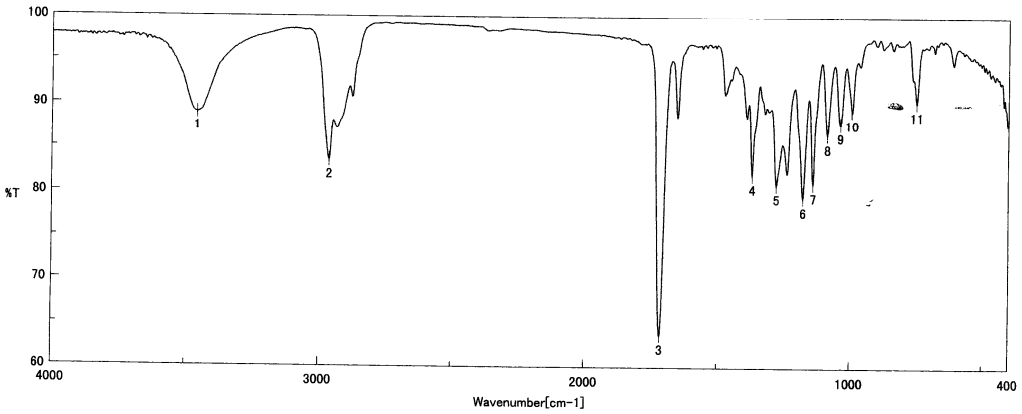
0

mAU

min

1: 225 nm, 4 nm

名前	保持時間	面積	面積%	ﾍﾟｰｽﾀｲﾌﾟｺｰﾄﾞ
	22.95	1874306	1.215	mm
	44.95	152423600	98.785	mm
トータル		154297906	100.000	



積算回数	16	分解	4 cm-1
ゼロフィリング	ON	アポダイゼーション	Cosine
ゲイン	2	スキャンスピード	2 mm/sec
日時	110/12/27 17:13		
測定者			
ファイル名	Memory#2		
サンプル名			
コメント			

1:	3456.78,	88.9821	2:	2961.16,	83.5828	3:	1716.34,	63.6688	4:	1369.21,	82.0688
5:	1277.61,	80.9737	6:	1177.33,	79.5013	7:	1139.72,	81.1139	8:	1085.73,	86.6202
9:	1036.55,	87.9065	10:	994.12,	89.3719	11:	750.17,	90.3487			

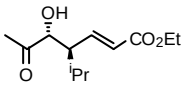
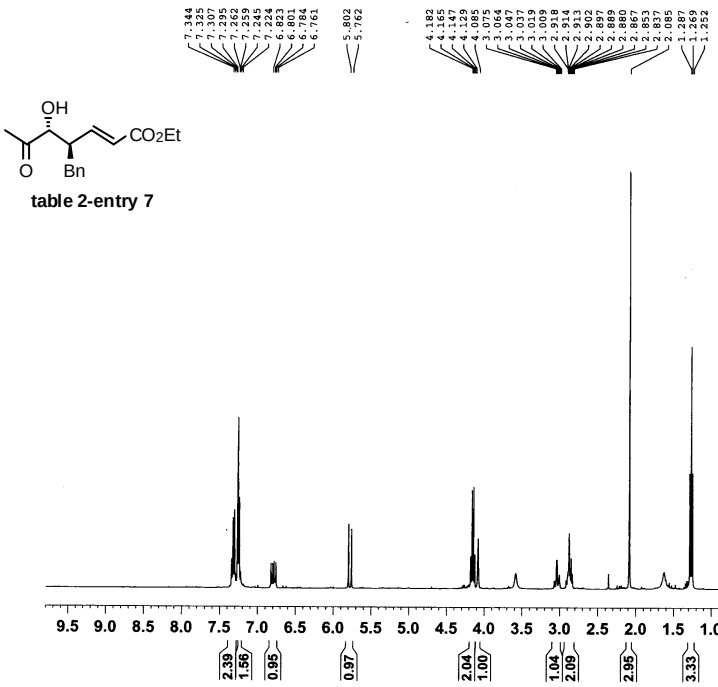
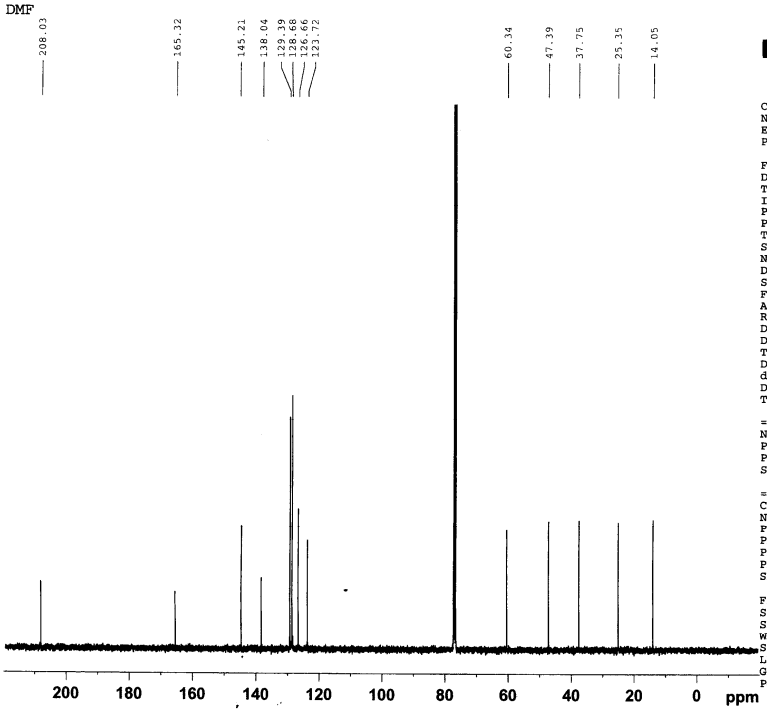


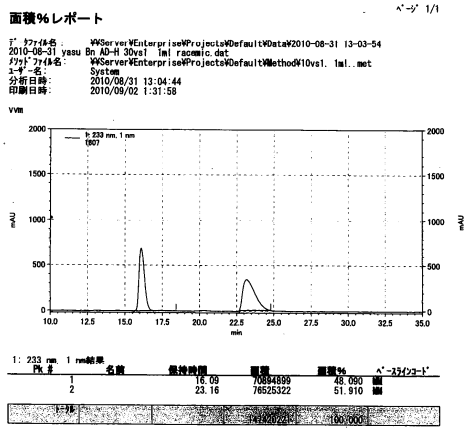
table 2-entry 6




```
Current Data Parameters
NAME      Sep05-2010-hayashi
EXPNO                     10
PROCNO                     1

F2 - Acquisition Parameters
Date_              20100906
Time                  11.01
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                      128
DS                        0
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      228
DW                   60.800 usec
DE                    6.00 usec
TE                   300.0 K
D1                2.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                      1H
P1                    12.00 usec
PL1                   -4.00 dB
SFO1             400.1824713 MHz

F2 - Processing parameters
SI                        32768
SF               400.1800083 MHz
WDW                          EM
SSB                           0
LB                         0.30 Hz
GB                            0
PC                         1.00
```




```
Current Data Parameters
NAME      Sep05-2010-hayashi
EXPNO                     11
PROCNO                     1

F2 - Acquisition Parameters
Date_              20100906
Time                  12.03
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                    65536
SOLVENT               CDCl3
NS                     1024
DS                        4
SWH               24038.461 Hz
FIDRES             0.366798 Hz
AQ                 1.3631988 sec
RG                       57
DW                   20.800 usec
DE                    6.00 usec
TE                   300.0 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     13C
P1                    7.20 usec
PL1                  -3.50 dB
SFO1            100.6354036 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                      1H
PCPD2                80.00 usec
PL2                   -4.00 dB
PL12                  14.00 dB
PL13                  14.00 dB
SFO2            400.1816007 MHz

F2 - Processing parameters
SI                        32768
SF               100.6253491 MHz
WDW                          EM
SSB                           0
LB                         1.00 Hz
GB                            0
PC                         1.40
```


面積%レポート

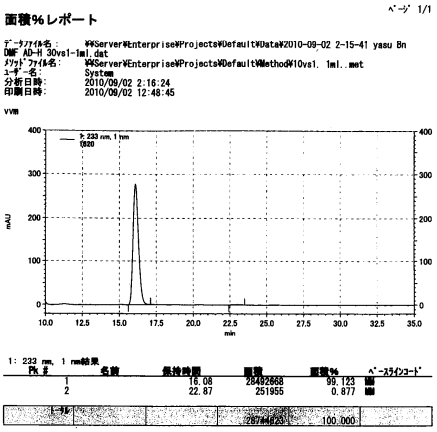
ページ 1/1

データファイル名 : ¥¥Server¥Enterprise¥Projects¥Default¥Data¥2010-08-31 13-03-54
2010-08-31 yasu Bn AD-H 30vs1 1ml racemic.dat
メソッドファイル名 : ¥¥Server¥Enterprise¥Projects¥Default¥Method¥10vs1. 1ml..met
ユーザー名 : System
分析日時 : 2010/08/31 13:04:44
印刷日時 : 2010/09/02 1:31:58

VVM

1: 233 nm, 1 nm結果

Pk #	名前	保持時間	面積	面積%	ベースラインコード
1		16.09	70894899	48.090	MM
2		23.16	76525322	51.910	MM
トータル			147420221	100.000	


面積%レポート

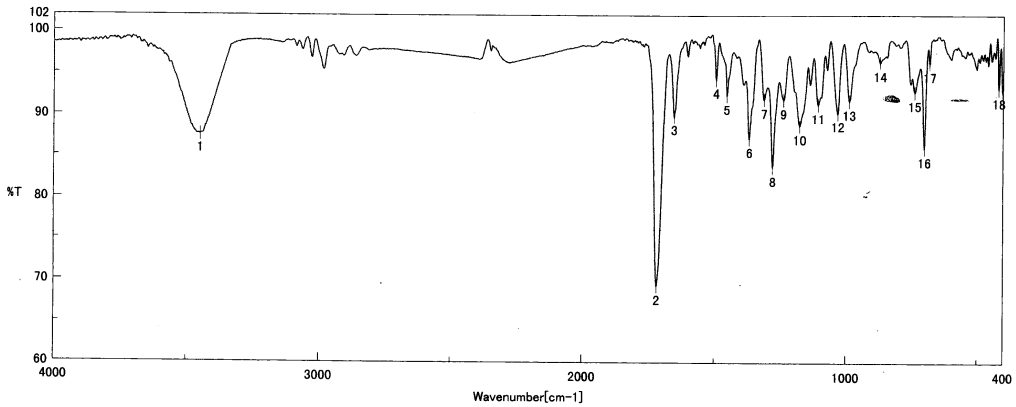
ページ 1/1

データファイル名 : ¥¥Server¥Enterprise¥Projects¥Default¥Data¥2010-09-02 2-15-41 yasu Bn
DMF AD-H 30vs1-1ml.dat
メソッドファイル名 : ¥¥Server¥Enterprise¥Projects¥Default¥Method¥10vs1. 1ml..met
ユーザー名 : System
分析日時 : 2010/09/02 2:16:24
印刷日時 : 2010/09/02 12:48:45

VVM

1: 233 nm, 1 nm結果

Pk #	名前	保持時間	面積	面積%	ベースラインコード
1		16.08	28492668	99.123	MM
2		22.87	251955	0.877	MM
トータル			28744623	100.000	



積算回数	18	分解	4 cm-1
ゼロフィリング	ON	アポダイゼーション	Cosine
ゲイン	1	スキャンスピード	2 mm/sec
日時	110/09/09 14:53		
測定者			
ファイル名	Memory#3		
サンプル名	buckground		
コメント			

1:	3448.10,	87.4946	2:	1717.30,	69.3204	3:	1653.66,	89.7914	4:	1495.53,	94.2920
5:	1455.03,	92.3550	6:	1369.21,	87.1243	7:	1313.29,	91.9230	8:	1280.50,	83.6969
9:	1239.04,	91.8856	10:	1177.33,	88.6815	11:	1107.90,	91.3059	12:	1032.69,	90.2599
13:	989.30,	91.7460	14:	871.67,	96.3824	15:	739.57,	92.8389	16:	701.96,	86.0141
17:	682.68,	96.3098	18:	417.51,	93.2013						

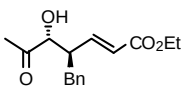
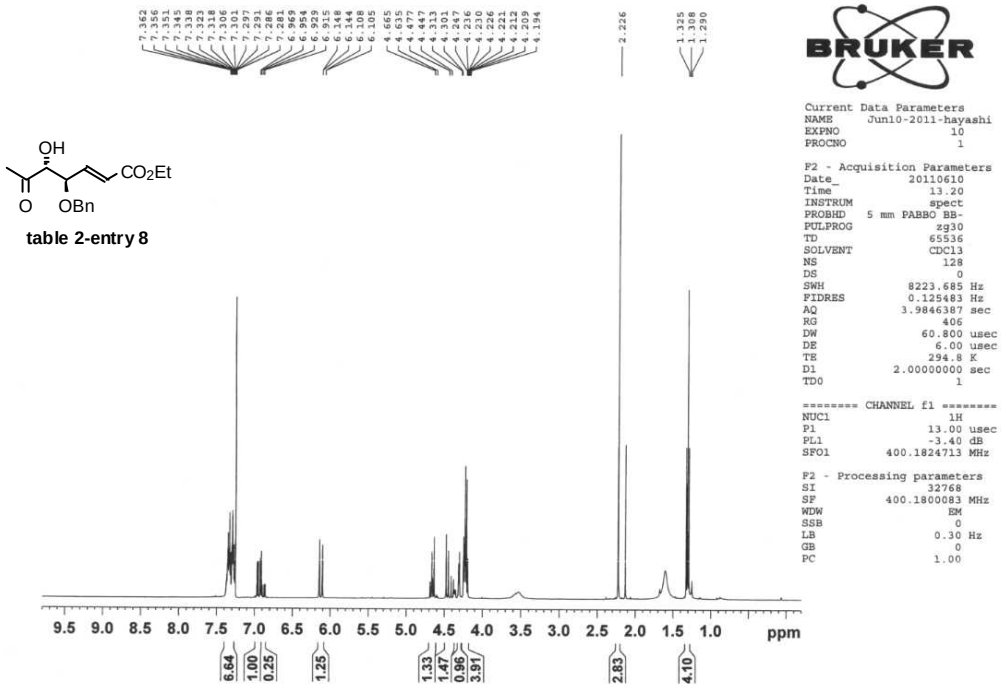
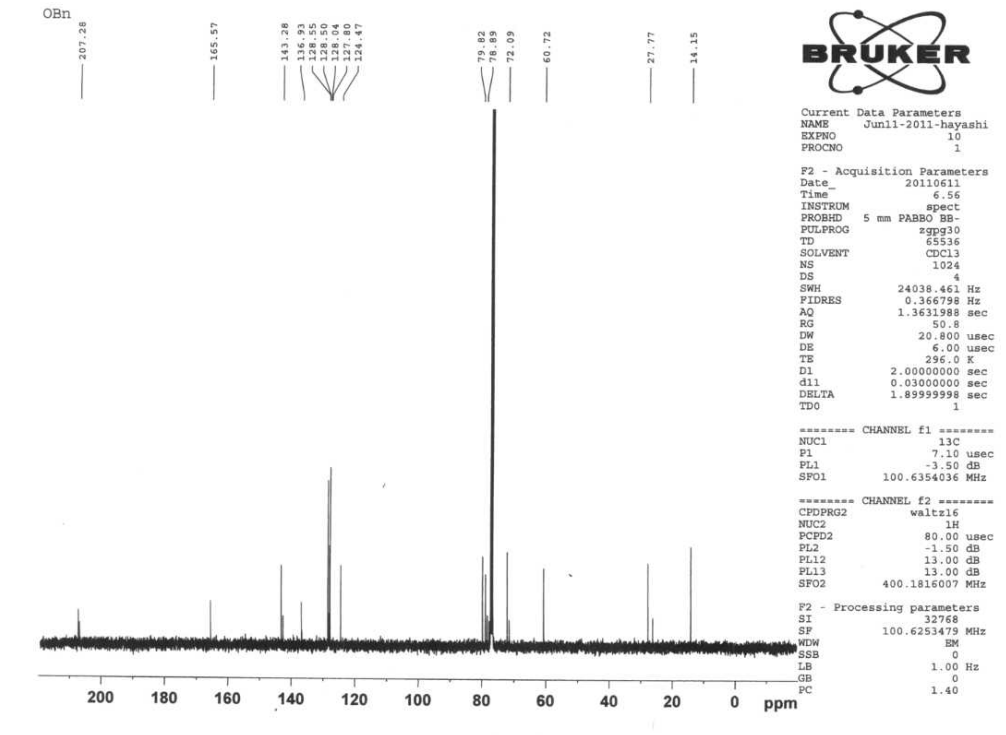
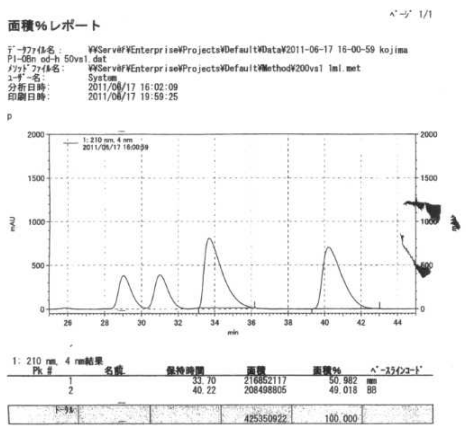
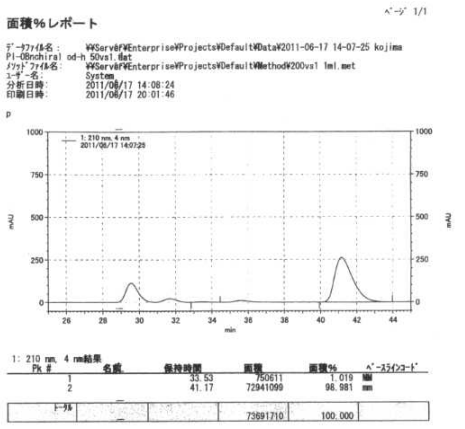


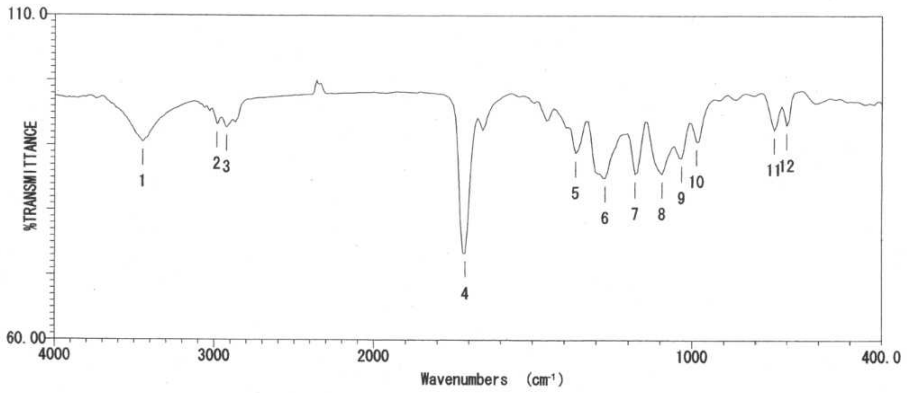
table 2-entry 7


OH
CO2Et
O
OBn
table 2-entry 8
BRUKER
Current Data Parameters
NAME Jun10-2011-hayashi
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110610
Time 13.20
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 128
DS 0
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 406
DW 60.800 usec
DE 6.00 usec
TE 294.8 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 13.00 usec
PL1 -3.40 dB
SFO1 400.1824713 MHz
F2 - Processing parameters
SI 32768
SF 400.1800083 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 ppm
6.64 1.00 0.25 1.25 1.33 1.47 0.96 3.91 2.83 4.10


OBn
207.28
165.57
143.28
136.93
128.55
128.50
128.04
127.80
124.47
79.82
78.89
72.09
60.72
27.77
14.15
BRUKER
Current Data Parameters
NAME Jun11-2011-hayashi
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110611
Time 6.56
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1024
DS 4
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631988 sec
RG 50.8
DW 20.800 usec
DE 6.00 usec
TE 296.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 7.10 usec
PL1 -3.50 dB
SFO1 100.6354036 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -1.50 dB
PL12 13.00 dB
PL13 13.00 dB
SFO2 400.1816007 MHz
F2 - Processing parameters
SI 32768
SF 100.6253479 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
200 180 160 140 120 100 80 60 40 20 0 ppm







ファイル名 : K0JP10Bn
タイトル :
測定日時 : 2011年06月11日 16時32分07秒
測定分解能 : 16 cm-1
スキャン回数 : 16 回
測定ゲイン : 1
コメント :

ピーク番号	波数(cm-1)	透過率(%)
01	3448.10	90.5240
02	2985.27	93.2999
03	2923.56	92.7684
04	1712.48	73.3431
05	1365.35	88.8091
06	1272.79	84.9508
07	1180.22	85.6147
08	1095.37	85.6022
09	1033.66	88.0772
10	987.375	90.6139
11	740.531	92.4428
12	701.962	93.0687

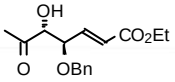
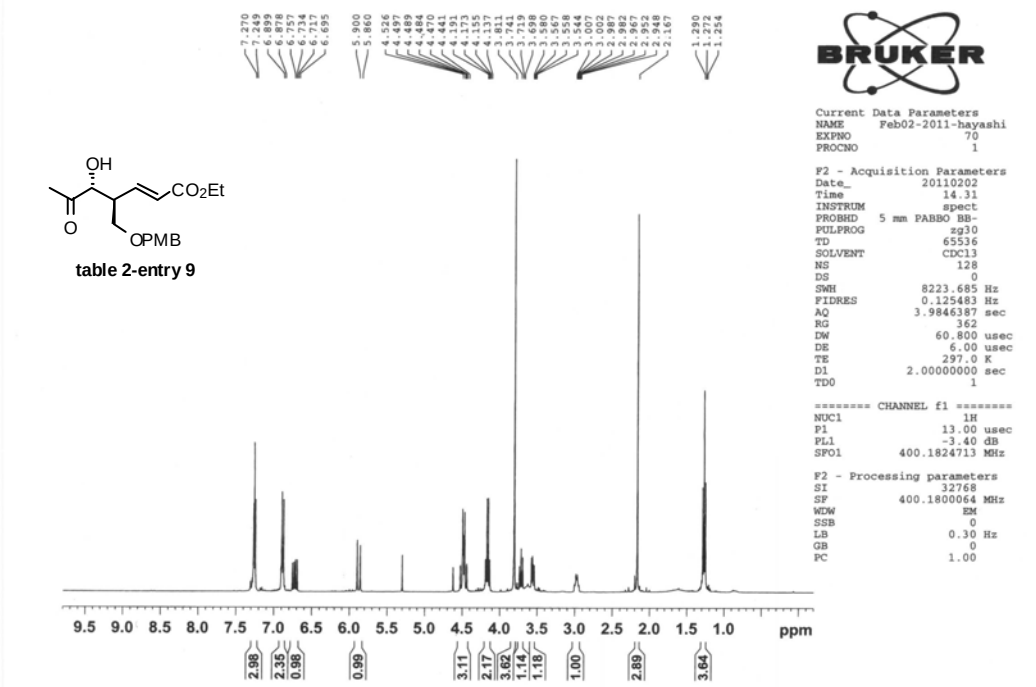
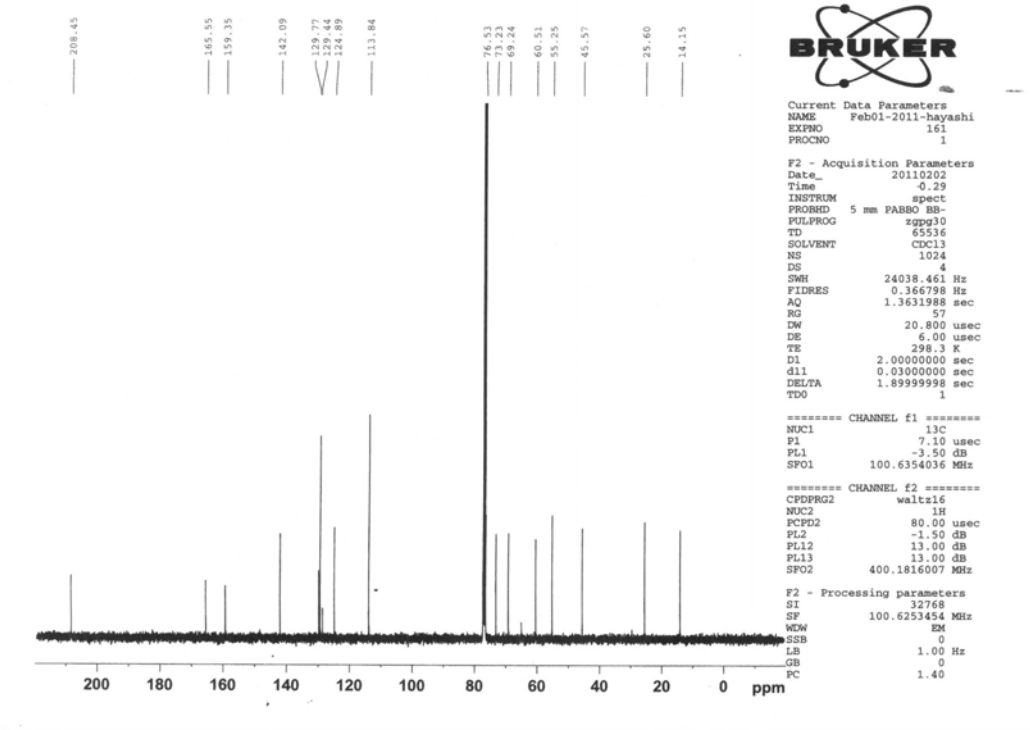
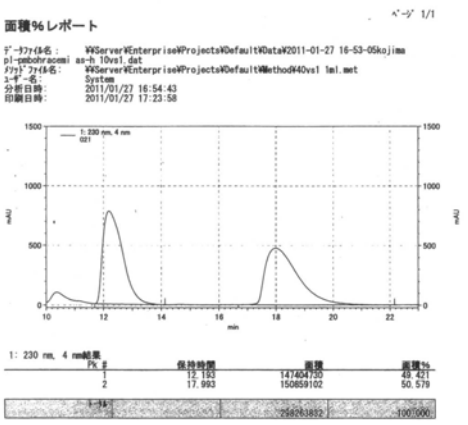
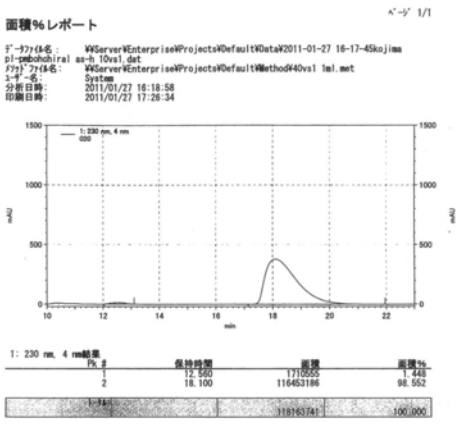


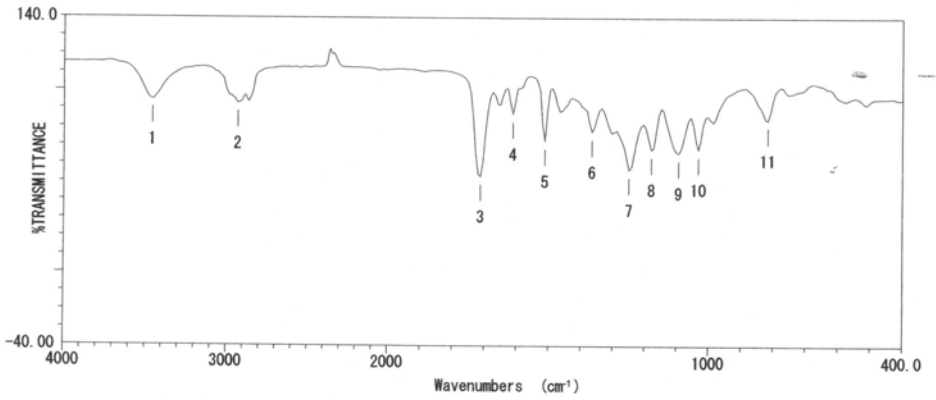
table 2-entry 8


OH
CO2Et
O
OPMB
table 2-entry 9
BRUKER
Current Data Parameters
NAME Feb02-2011-hayashi
EXPNO 70
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110202
Time 14.31
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 128
DS 0
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 362
DW 60.800 usec
DE 6.00 usec
TE 297.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 13.00 usec
PL1 -3.40 dB
SFO1 400.1824713 MHz
F2 - Processing parameters
SI 32768
SF 400.1800064 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
ppm


BRUKER
Current Data Parameters
NAME Feb01-2011-hayashi
EXPNO 161
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110202
Time 0.29
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1024
DS 4
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631988 sec
RG 57
DW 20.800 usec
DE 6.00 usec
TE 298.3 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 7.10 usec
PL1 -3.50 dB
SFO1 100.6354036 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -1.50 dB
PL12 13.00 dB
PL13 13.00 dB
SFO2 400.1816007 MHz
F2 - Processing parameters
SI 32768
SF 100.6253454 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
ppm


面積％レポート


面積％レポート



ファイル名 : kojPIPMB
タイトル :
測定日時 : 2011年02月03日 12時03分24秒
測定分解能 : 16 cm-1
スキャン回数 : 16 回
測定ゲイン : 1
コメント :

ピーク番号	波数(cm-1)	透過率(%)
01	3455.81	94.8913
02	2931.27	92.7966
03	1712.48	53.0278
04	1612.20	87.4039
05	1511.92	72.5206
06	1365.35	77.6237
07	1249.65	56.7254
08	1180.22	67.9969
09	1095.37	66.1296
10	1033.66	68.1978
11	817.670	84.2725

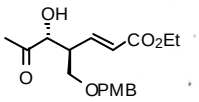


table 2-entry 9

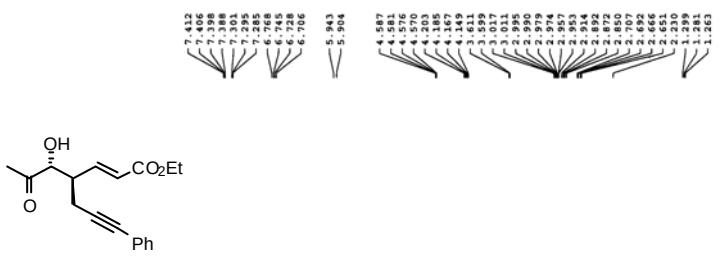


table 2-entry 10

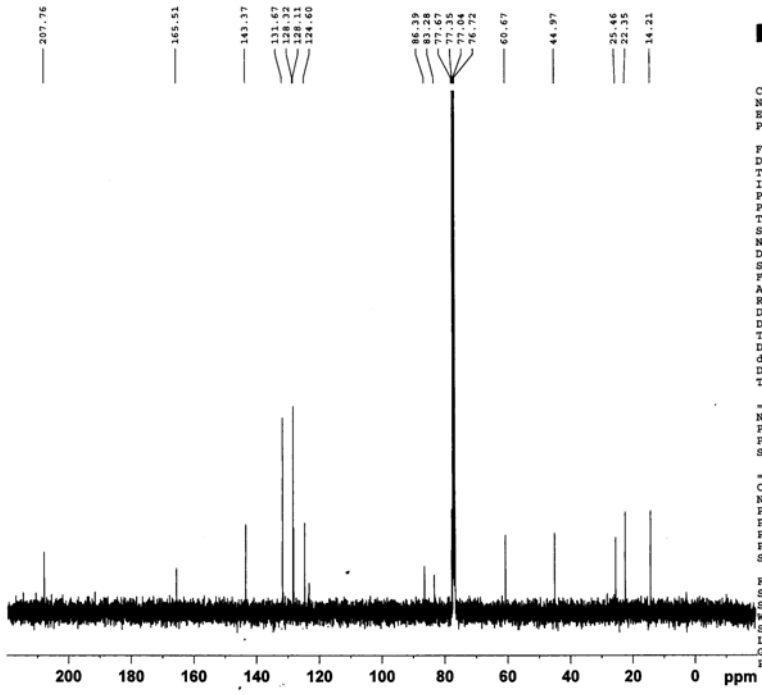
BRUKER

Current Data Parameters
NAME Nov12-2010-hayashi
EXPNO 110
PROCNO 1

F2 - Acquisition Parameters
Date_ 20101112
Time 15.51
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 512
DW 60.800 usec
DE 6.00 usec
TE 296.9 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 13.00 usec
PL1 -3.40 dB
SFO1 400.1824713 MHz

F2 - Processing parameters
SI 32768
SF 400.1800087 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



BRUKER

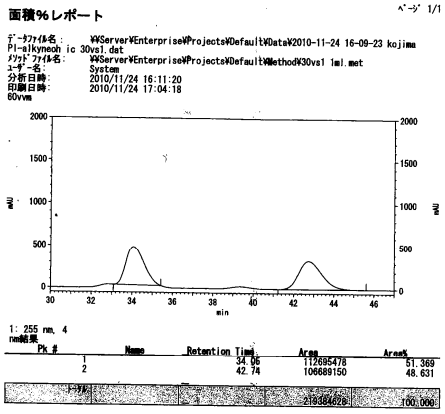
Current Data Parameters
NAME Nov12-2010-hayashi
EXPNO 210
PROCNO 1

F2 - Acquisition Parameters
Date_ 20101113
Time 2.44
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1024
DS 4
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631988 sec
RG 57
DW 20.800 usec
DE 6.00 usec
TE 298.6 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1

======== CHANNEL f1 ========
NUC1 13C
P1 7.10 usec
PL1 -3.50 dB
SFO1 100.6354036 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -1.50 dB
PL12 13.00 dB
PL13 13.00 dB
SFO2 400.1816007 MHz

F2 - Processing parameters
SI 32768
SF 100.6253393 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

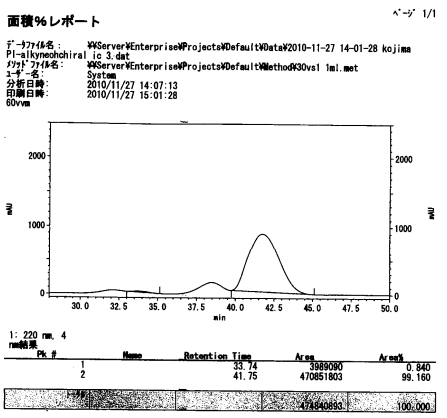

面積%レポート

ページ 1/1

データファイル名： ¥¥Server¥Enterprise¥Projects¥Default¥Data¥2010-11-24 16-09-23 kojima
Pl-alkyneoh ic 30vs1.dat
メソッドファイル名： ¥¥Server¥Enterprise¥Projects¥Default¥Method¥30vs1 1ml.met
ユーザー名： System
分析日時： 2010/11/24 16:11:20
印刷日時： 2010/11/24 17:04:18
60vvm

1: 255 nm, 4
nm結果

Pk #	Name	Retention Time	Area	Area%
1		34.06	11269478	51.369
2		42.74	10688150	48.631
合計			21938428	100.000

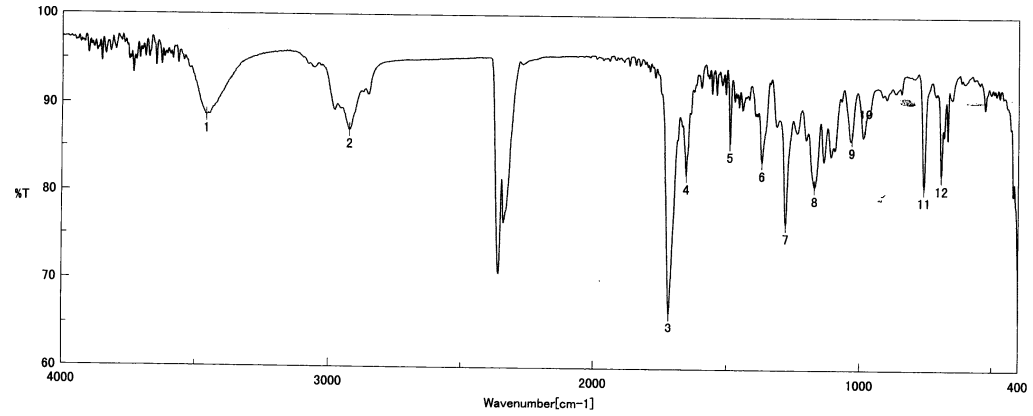

面積%レポート

ページ 1/1

データファイル名： ¥¥Server¥Enterprise¥Projects¥Default¥Data¥2010-11-27 14-01-28 kojima
Pl-alkynechiral ic 3.dat
メソッドファイル名： ¥¥Server¥Enterprise¥Projects¥Default¥Method¥30vs1 1ml.met
ユーザー名： System
分析日時： 2010/11/27 14:07:13
印刷日時： 2010/11/27 15:01:28
60vvm

1: 220 nm, 4
nm結果

Pk #	Name	Retention Time	Area	Area%
1		33.74	3989080	0.840
2		41.75	470851803	99.160
合計			474840883	100.000



積算回数	16
ゼロフィリング	ON
ゲイン	2
日時	110/12/27 17:46
測定者	
ファイル名	Memory#2
サンプル名	
コメント	

分解	4 cm-1
アポダイゼーション	Cosine
スキャンスピード	2 mm/sec

1:	3459.67,	88.5708	2:	2923.56,	86.9718	3:	1717.30,	66.4038	4:	1653.66,	82.0789
5:	1490.70,	85.7166	6:	1370.18,	83.6289	7:	1279.54,	76.4524	8:	1172.51,	80.8416
9:	1031.73,	86.3235	10:	980.63,	87.7174	11:	757.89,	80.7315	12:	692.32,	82.0634

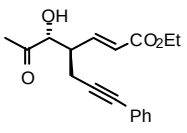


table 2-entry 10

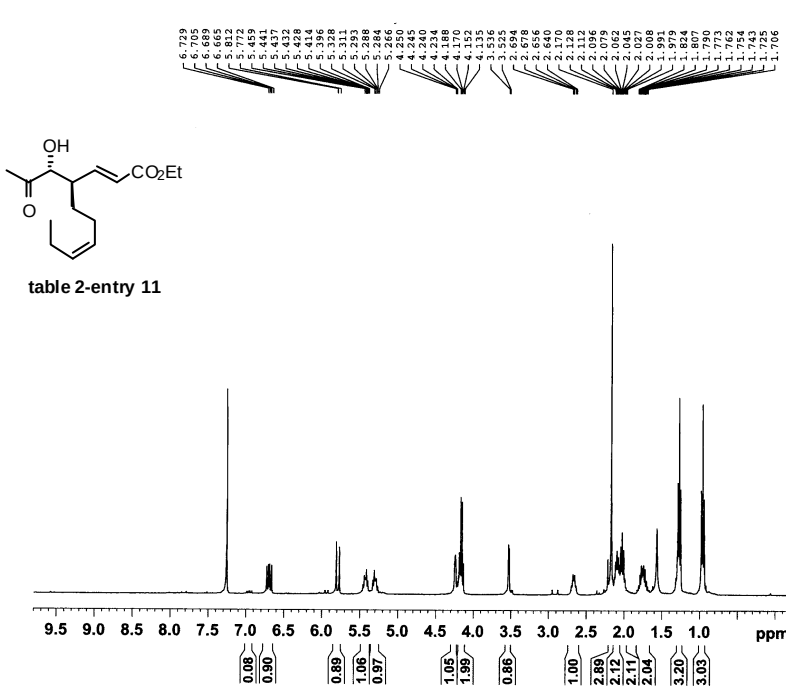
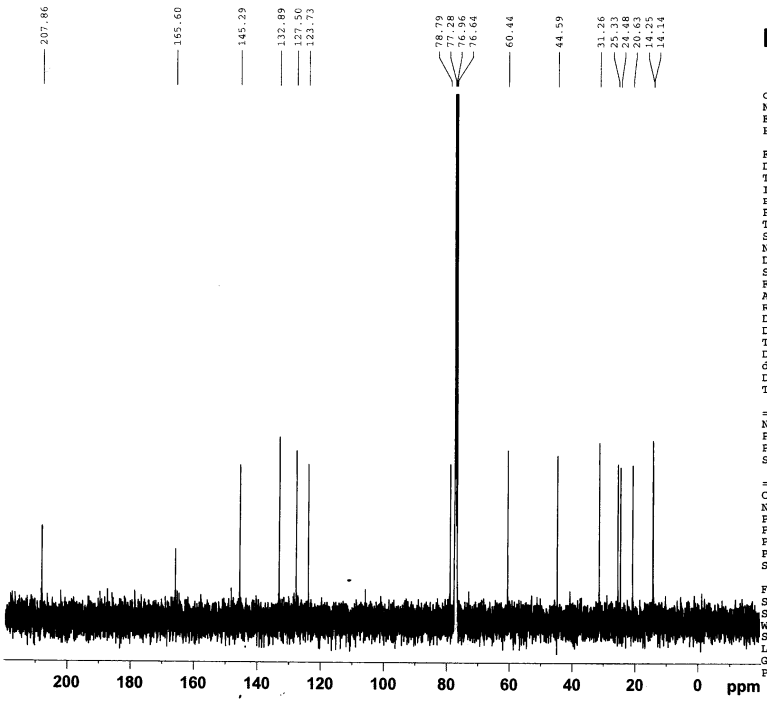
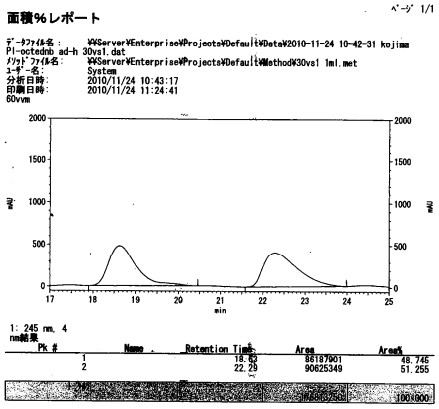


table 2-entry 11

```
Current Data Parameters
NAME      Nov16-2010-hayashi
EXPNO                    200
PROCNO                     1

F2 - Acquisition Parameters
Date_              20101116
Time                  19.35
INSTRUM               spect
PROBHD   5 mm PABBO BB-
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH                8223.685 Hz
FIDRES            0.125483 Hz
AQ                3.9846387 sec
RG                     456
DW                  60.800 usec
DE                   6.00 usec
TE                  297.4 K
D1                1.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     13.00 usec
PL1                    -3.40 dB
SFO1           400.1824713 MHz

F2 - Processing parameters
SI                       32768
SF             400.1800086 MHz
WDW                         EM
SSB                          0
LB                        0.30 Hz
GB                           0
PC                        1.00
```




```
Current Data Parameters
NAME      Nov18-2010-hayashi
EXPNO                    210
PROCNO                     1

F2 - Acquisition Parameters
Date_              20101119
Time                   1.37
INSTRUM               spect
PROBHD   5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    1024
DS                       4
SWH               24038.461 Hz
FIDRES            0.366798 Hz
AQ                1.3631988 sec
RG                     114
DW                  20.800 usec
DE                   6.00 usec
TE                  298.2 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                     13C
P1                     7.10 usec
PL1                   -3.50 dB
SFO1           100.6354036 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                      1H
PCPD2                 80.00 usec
PL2                   -1.50 dB
PL12                  13.00 dB
PL13                  13.00 dB
SFO2           400.1816007 MHz

F2 - Processing parameters
SI                       32768
SF             100.6253471 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

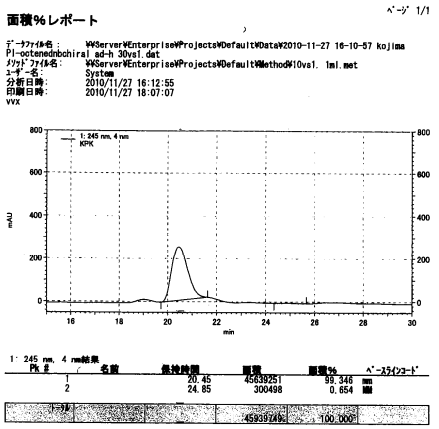

面積％レポート

ﾍﾟｰｼﾞ 1/1

ﾃﾞｰﾀﾌｧｲﾙ名： ¥¥Server¥Enterprise¥Projects¥Default¥Data¥2010-11-24 10-42-31 kojima
Pl-octednb ad-h 30vs1.dat
ﾒｿｯﾄﾞﾌｧｲﾙ名： ¥¥Server¥Enterprise¥Projects¥Default¥Method¥30vs1 1ml.met
ﾕｰｻﾞｰ名： System
分析日時： 2010/11/24 10:43:17
印刷日時： 2010/11/24 11:24:41
60vvm

1: 245 nm, 4 nm結果

Pk #	Name	Retention Time	Area	Area%
1		18.63	86187951	48.745
2		22.29	90625349	51.255
合計			176813300	100.000


面積％レポート

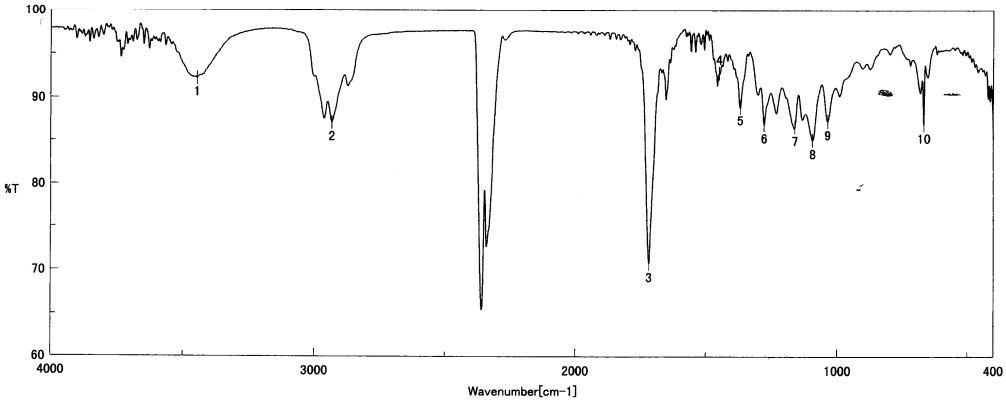
ﾍﾟｰｼﾞ 1/1

ﾃﾞｰﾀﾌｧｲﾙ名： ¥¥Server¥Enterprise¥Projects¥Default¥Data¥2010-11-27 16-10-57 kojima
Pl-octanendnbchiral ad-h 30vs1.dat
ﾒｿｯﾄﾞﾌｧｲﾙ名： ¥¥Server¥Enterprise¥Projects¥Default¥Method¥10vs1. 1ml.met
ﾕｰｻﾞｰ名： System
分析日時： 2010/11/27 16:12:55
印刷日時： 2010/11/27 18:07:07
vvx

1: 245 nm, 4 nm
KPK

1: 245 nm, 4 nm結果

Pk #	名前	保持時間	面積	面積%	ﾍﾟｰｽﾀｲﾌﾟ
1		20.45	45639251	99.346	nm
2		24.85	300498	0.654	bb
合計			45939749	100.000	



積算回数	16	分解	4 cm-1
ゼロフィリング	ON	アポダイゼーション	Cosine
ゲイン	1	スキャンスピード	2 mm/sec
日時	110/12/27 17:30		
測定者			
ファイル名	Memory#2		
サンプル名			
コメント			

1:	3446.17,	92.2688	2:	2933.20,	87.1107	3:	1718.26,	70.7885	4:	1450.21,	92.8443
5:	1370.18,	88.9362	6:	1279.54,	86.8849	7:	1161.90,	86.5854	8:	1095.37,	85.0875
9:	1037.52,	87.2650	10:	668.21,	86.8934						

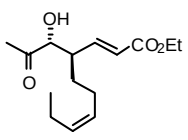


table 2-entry 11

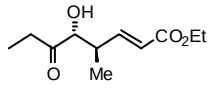
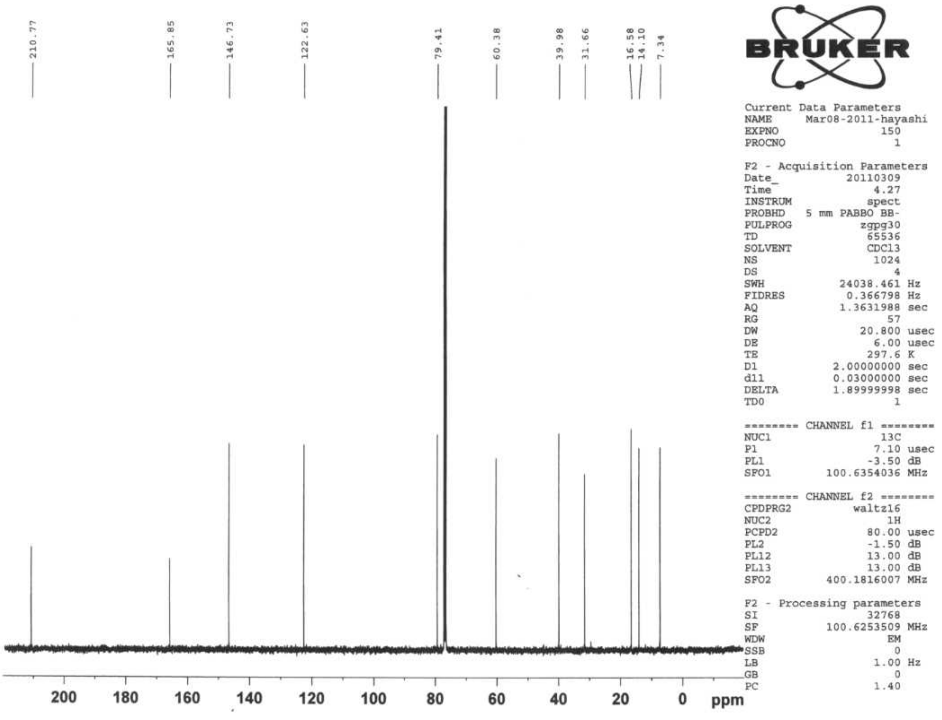
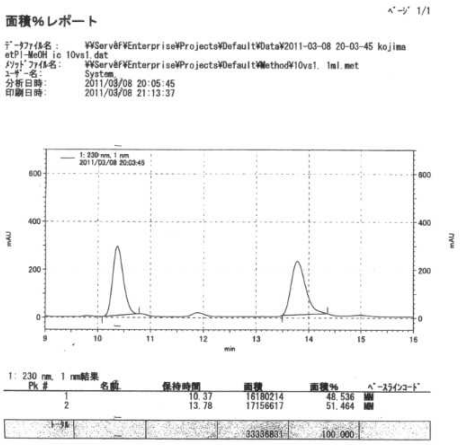


table 2-entry 12,13





面積％レポート

ページ 1/1

データファイル名： ¥¥Serv6¥¥Enterprise¥¥Projects¥¥Default¥¥Data¥¥2011-03-08 20-03-45 kojima
メソッドファイル名： ¥¥Serv6¥¥Enterprise¥¥Projects¥¥Default¥¥Method¥¥10vs1. 1ml.met
ユーザー名： System
分析日時： 2011/03/08 20:05:45
印刷日時： 2011/03/08 21:13:37

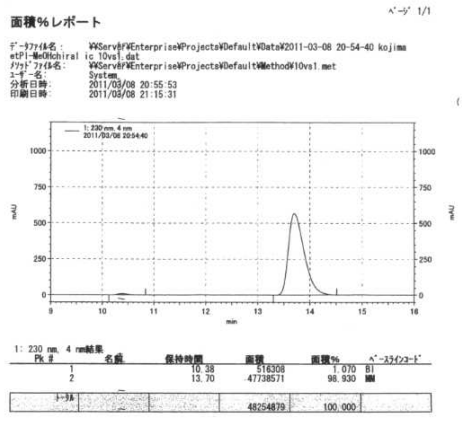
1: 230 nm, 1 nm 2011/03/08 20:03:45

mAU

min

1: 230 nm, 1 nm結果

Pk #	名前	保持時間	面積	面積%	ベースラインコード
1		10.37	16780214	48.536	MM
2		13.78	17756617	51.464	MM
トータル			33338831	100.000	



面積％レポート

ページ 1/1

データファイル名： ¥¥Serv6¥¥Enterprise¥¥Projects¥¥Default¥¥Data¥¥2011-03-08 20-54-40 kojima
メソッドファイル名： ¥¥Serv6¥¥Enterprise¥¥Projects¥¥Default¥¥Method¥¥10vs1.met
ユーザー名： System
分析日時： 2011/03/08 20:55:53
印刷日時： 2011/03/08 21:15:31

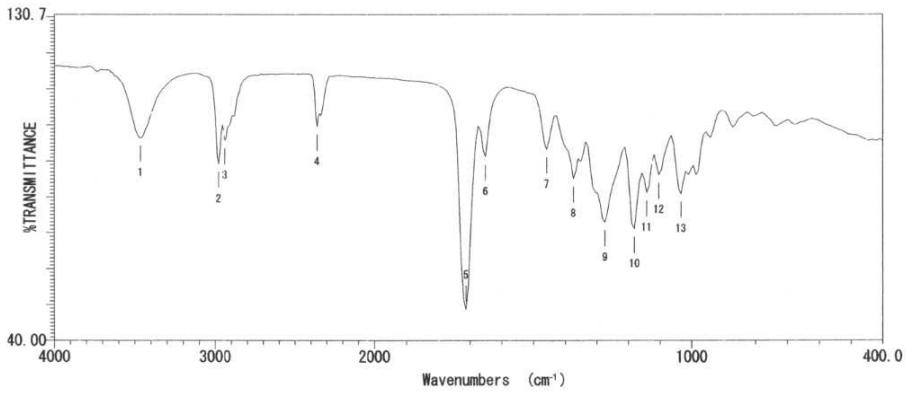
1: 230 nm, 4 nm 2011/03/08 20:54:40

mAU

min

1: 230 nm, 4 nm結果

Pk #	名前	保持時間	面積	面積%	ベースラインコード
1		10.38	516308	1.070	BV
2		13.70	47738571	98.930	VB
トータル			48254879	100.000	



ファイル名 : kojiEtPI
タイトル :
測定日時 : 2011年03月31日 16時21分40秒
測定分解能 : 16 cm-1
スキャン回数 : 16 回
測定ゲイン : 1
コメント :

ピーク番号	波数(cm-1)	透過率(%)
01	3463.53	96.5723
02	2977.55	89.1598
03	2938.98	95.7716
04	2360.44	99.5498
05	1712.48	48.6702
06	1650.77	91.2062
07	1457.92	93.1995
08	1373.07	85.0766
09	1272.79	72.9176
10	1180.22	71.1038
11	1141.65	81.1192
12	1103.08	86.1802
13	1033.66	80.8741

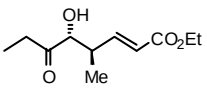


table 2-entry 12,13

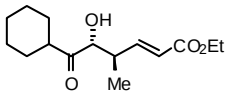
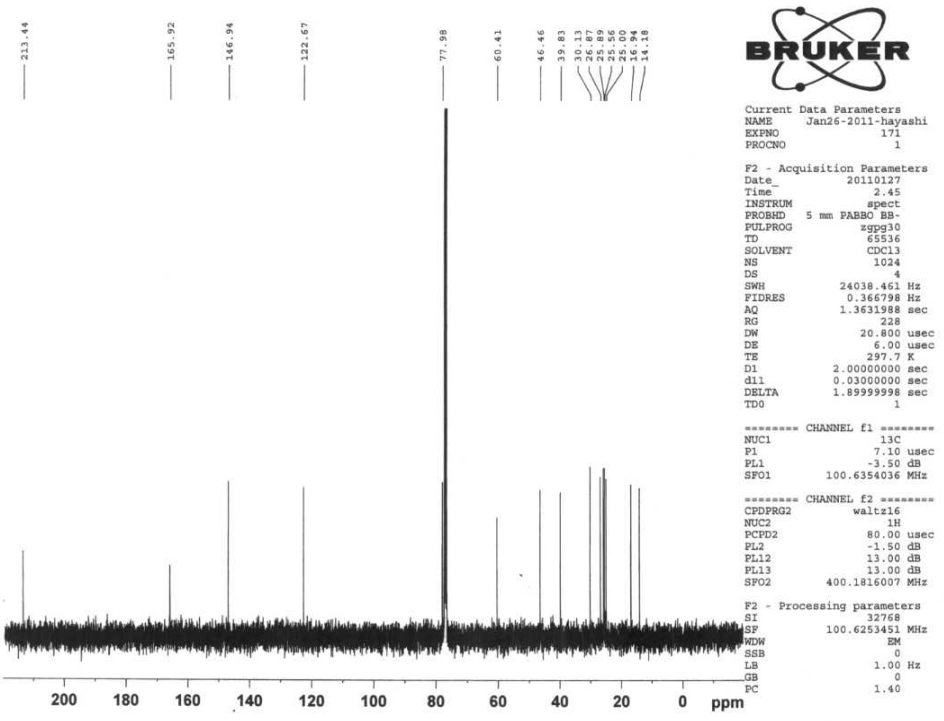
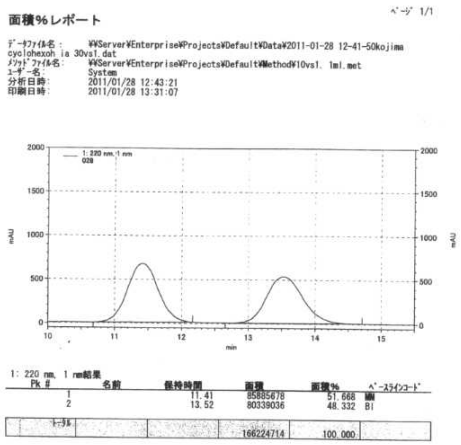


table 2-entry 14,15





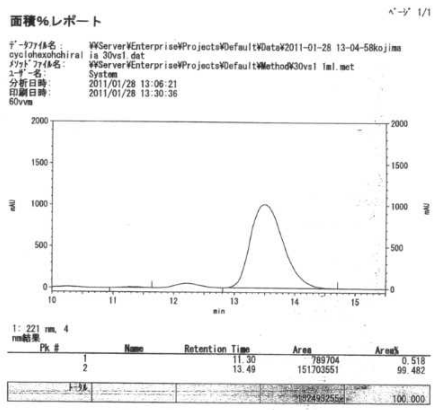
面積％レポート

ﾍﾟｰｼﾞ 1/1

ﾃﾞｰﾀﾌｧｲﾙ名： ¥¥Server¥Enterprise¥Projects¥Default¥Data¥2011-01-28 12-41-50kojima
cyclohexoh ia 30vs1.dat
ﾒｿｯﾄﾞﾌｧｲﾙ名： ¥¥Server¥Enterprise¥Projects¥Default¥Method¥10vs1. 1ml.met
ﾕｰｻﾞｰ名： System
分析日時： 2011/01/28 12:43:21
印刷日時： 2011/01/28 13:31:07

1: 220 nm, 1 nm結果

Pk #	名前	保持時間	面積	面積%	ﾍﾟｰｽﾀｲﾌﾟ
1		11.41	85885678	51.668	BM
2		13.52	80339036	48.332	BI
ﾄｰﾀﾙ			166224714	100.000	



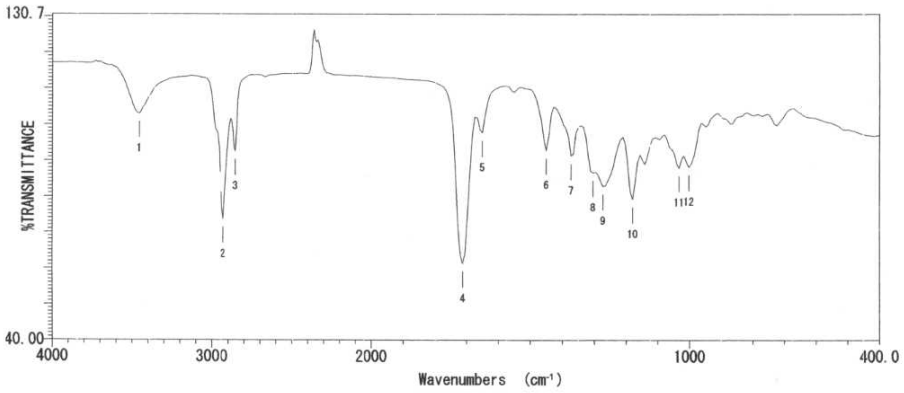
面積％レポート

ﾍﾟｰｼﾞ 1/1

ﾃﾞｰﾀﾌｧｲﾙ名： ¥¥Server¥Enterprise¥Projects¥Default¥Data¥2011-01-28 13-04-58kojima
cyclohexohchiral ia 30vs1.dat
ﾒｿｯﾄﾞﾌｧｲﾙ名： ¥¥Server¥Enterprise¥Projects¥Default¥Method¥30vs1 1ml.met
ﾕｰｻﾞｰ名： System
分析日時： 2011/01/28 13:06:21
印刷日時： 2011/01/28 13:30:36
60vvm

1: 221 nm, 4 nm結果

Pk #	Name	Retention Time	Area	Area%
1		11.30	789704	0.518
2		13.49	151703551	99.482
ﾄｰﾀﾙ			[illegible]	100.000



ファイル名 : kojHexPI
タイトル :
測定日時 : 2011年03月31日 16時12分31秒
測定分解能 : 16 cm-1
スキャン回数 : 16 回
測定ゲイン : 1
コメント :

ﾋﾟｰｸ番号	波数(cm-1)	透過率(%)
01	3455.81	103.066
02	2931.27	73.6572
03	2854.13	92.5419
04	1712.48	61.3382
05	1650.77	97.7289
06	1450.21	92.8646
07	1373.07	91.2893
08	1303.64	86.6037
09	1272.79	82.8561
10	1180.22	79.1643
11	1033.66	87.9921
12	1002.80	88.2468

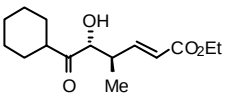


table 2-entry 14,15

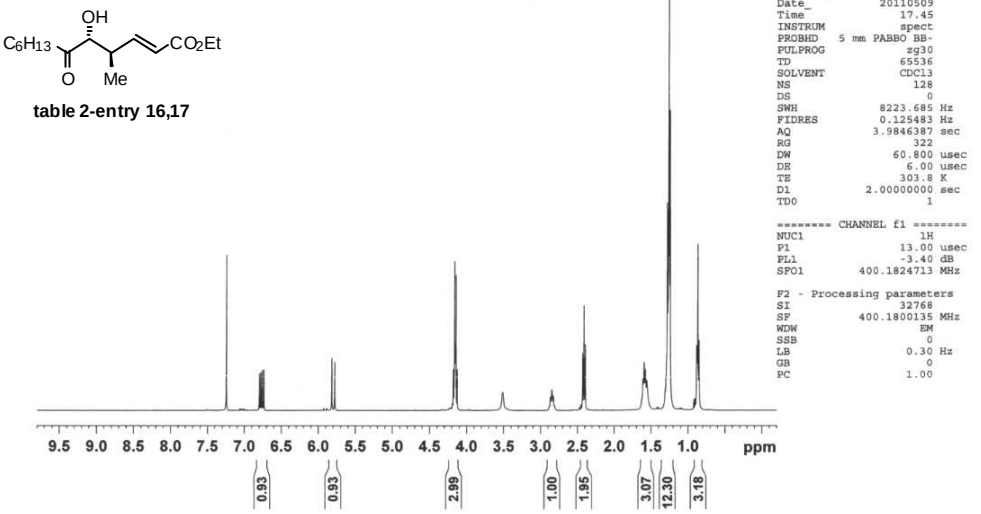
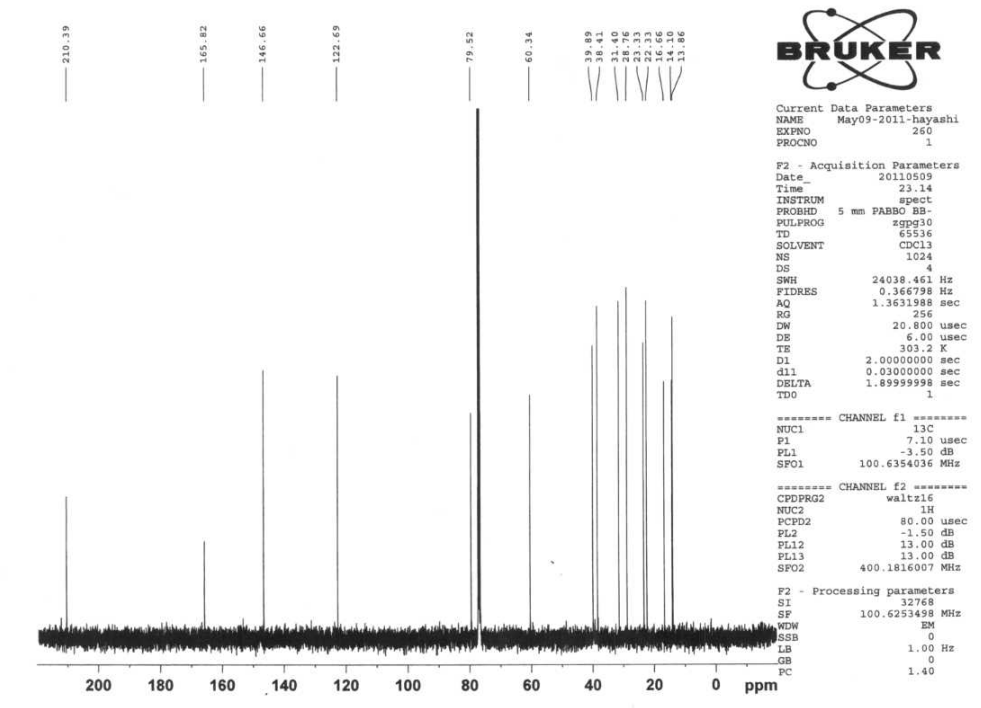


table 2-entry 16,17

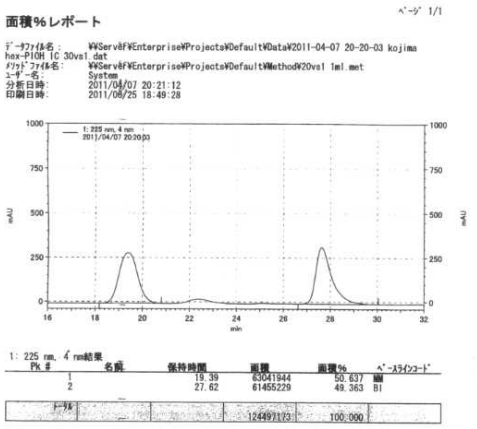
BRUKER

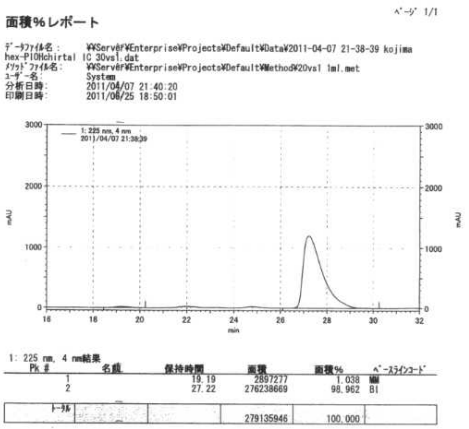
```
Current Data Parameters
NAME      May09-2011-hayashi
EXPNO              140
PROCNO               1

F2 - Acquisition Parameters
Date_           20110509
Time              17.45
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG           zg30
TD               65536
SOLVENT          CDCl3
NS                 128
DS                   0
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG                 322
DW              60.800 usec
DE               6.00 usec
TE              303.8 K
D1            2.00000000 sec
TD0                  1

======== CHANNEL f1 ========
NUC1                1H
P1               13.00 usec
PL1              -3.40 dB
SFO1        400.1824713 MHz

F2 - Processing parameters
SI               32768
SF          400.1800135 MHz
WDW                 EM
SSB                  0
LB                0.30 Hz
GB                   0
PC                1.00
```

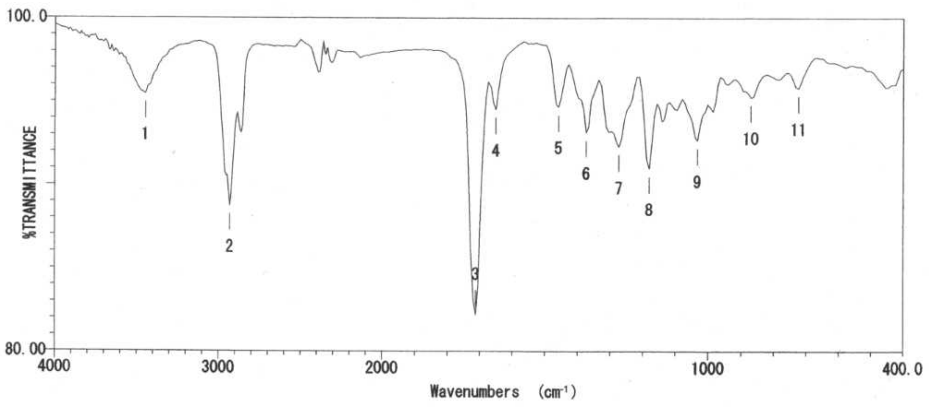


BRUKER

```
Current Data Parameters
NAME      May09-2011-hayashi
EXPNO              260
PROCNO               1

F2 - Acquisition Parameters
Date_           20110509
Time              23.14
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD               65536
SOLVENT          CDCl3
NS                1024
DS                   4
SWH          24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG                 256
DW              20.800 usec
DE               6.00 usec
TE              303.2 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.89999998 sec
TD0                  1

======== CHANNEL f1 ========
NUC1                13C
P1               7.10 usec
PL1              -3.50 dB
SFO1        100.6354036 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2            80.00 usec
PL2              -1.50 dB
PL12             13.00 dB
PL13             13.00 dB
SFO2        400.1816007 MHz

F2 - Processing parameters
SI               32768
SF          100.6253498 MHz
WDW                 EM
SSB                  0
LB               1.00 Hz
GB                   0
PC                1.40
```


面積％レポート


面積％レポート



ファイル名	KOJC6P1
タイトル	
測定日時	2011年06月11日 16時14分42秒
測定分解能	16 cm-1
スキャン回数	16 回
測定ゲイン	1
コメント	

ピーク番号	波数(cm-1)	透過率(%)
01	3448.10	95.4612
02	2931.27	88.7130
03	1712.48	82.2081
04	1650.77	94.5194
05	1457.92	94.6733
06	1373.07	93.1471
07	1272.79	92.2762
08	1180.22	90.9803
09	1033.66	92.6619
10	871.667	95.2403
11	725.104	95.7945

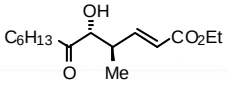
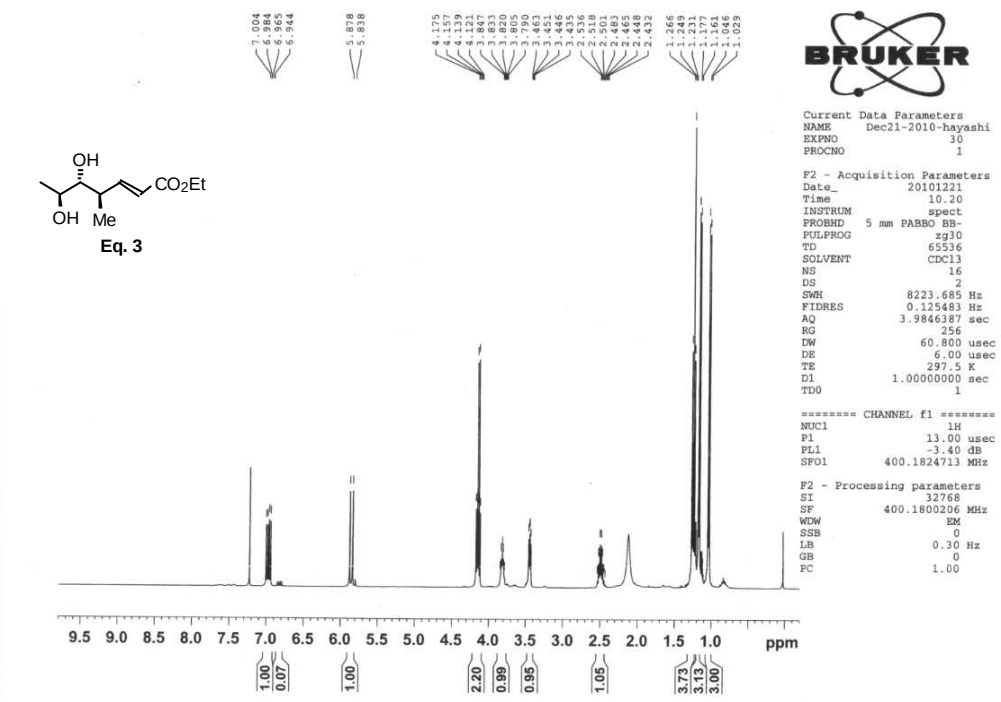
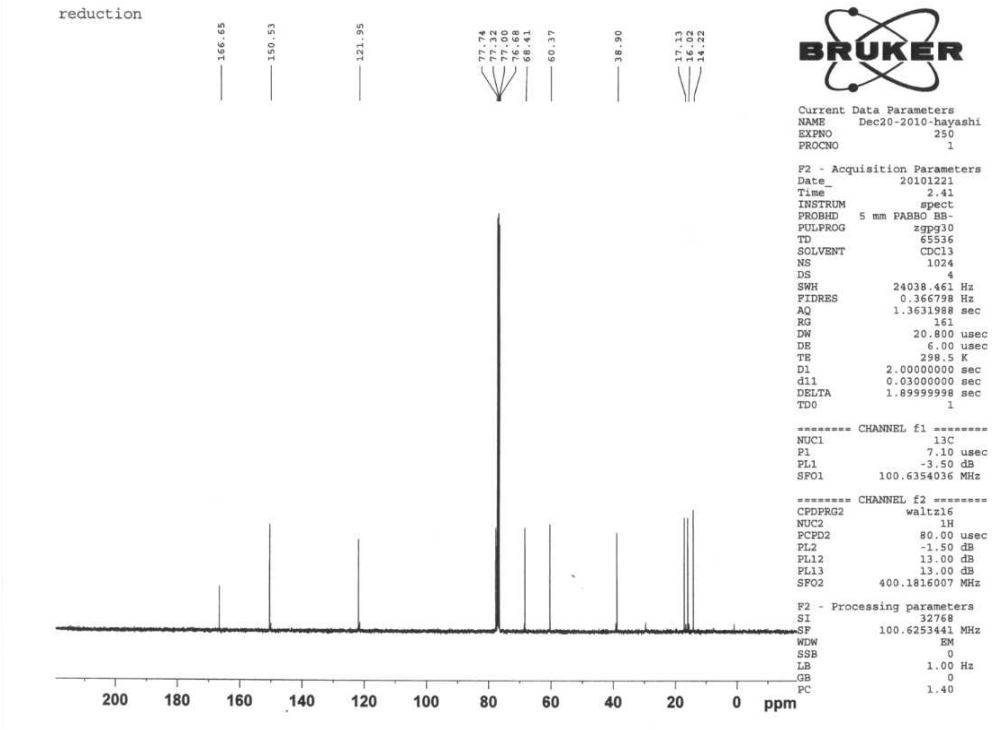
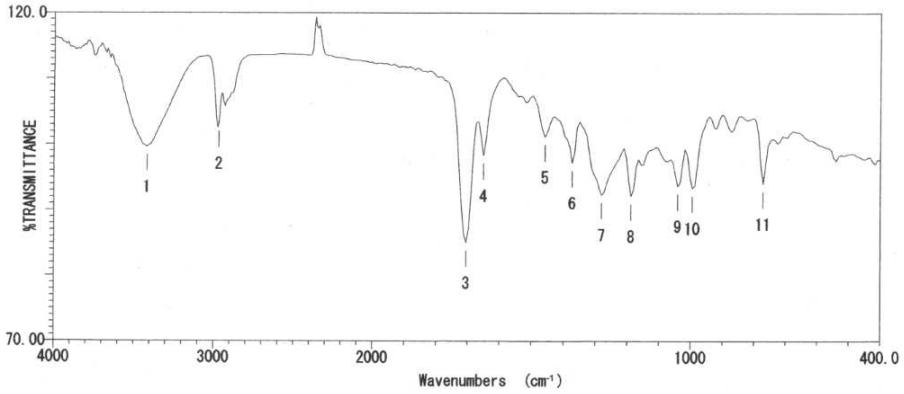


table 2-entry 16,17

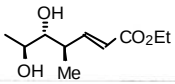

OH
CO2Et
OH
Me
Eq. 3
7.004
6.984
6.965
6.944
5.878
5.838
4.175
4.157
4.139
4.121
3.847
3.833
3.820
3.805
3.790
3.463
3.451
3.446
3.436
2.536
2.518
2.501
2.483
2.465
2.448
2.432
1.266
1.249
1.231
1.177
1.161
1.146
1.029
BRUKER
Current Data Parameters
NAME Dec21-2010-hayashi
EXPNO 30
PROCNO 1
F2 - Acquisition Parameters
Date_ 20101221
Time 10.20
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 256
DW 60.800 usec
DE 6.00 usec
TE 297.5 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 13.00 usec
PL1 -3.40 dB
SFO1 400.1824713 MHz
F2 - Processing parameters
SI 32768
SF 400.1800206 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0
ppm
1.00
0.07
1.00
2.20
0.99
0.95
1.05
3.73
3.13
3.00


reduction
166.65
150.53
121.95
77.74
77.32
77.00
76.68
68.41
60.37
38.90
17.13
16.02
14.22
BRUKER
Current Data Parameters
NAME Dec20-2010-hayashi
EXPNO 250
PROCNO 1
F2 - Acquisition Parameters
Date_ 20101221
Time 2.41
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1024
DS 4
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631988 sec
RG 161
DW 20.800 usec
DE 6.00 usec
TE 298.5 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 7.10 usec
PL1 -3.50 dB
SFO1 100.6354036 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -1.50 dB
PL12 13.00 dB
PL13 13.00 dB
SFO2 400.1816007 MHz
F2 - Processing parameters
SI 32768
SF 100.6253441 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
200 180 160 140 120 100 80 60 40 20 0
ppm

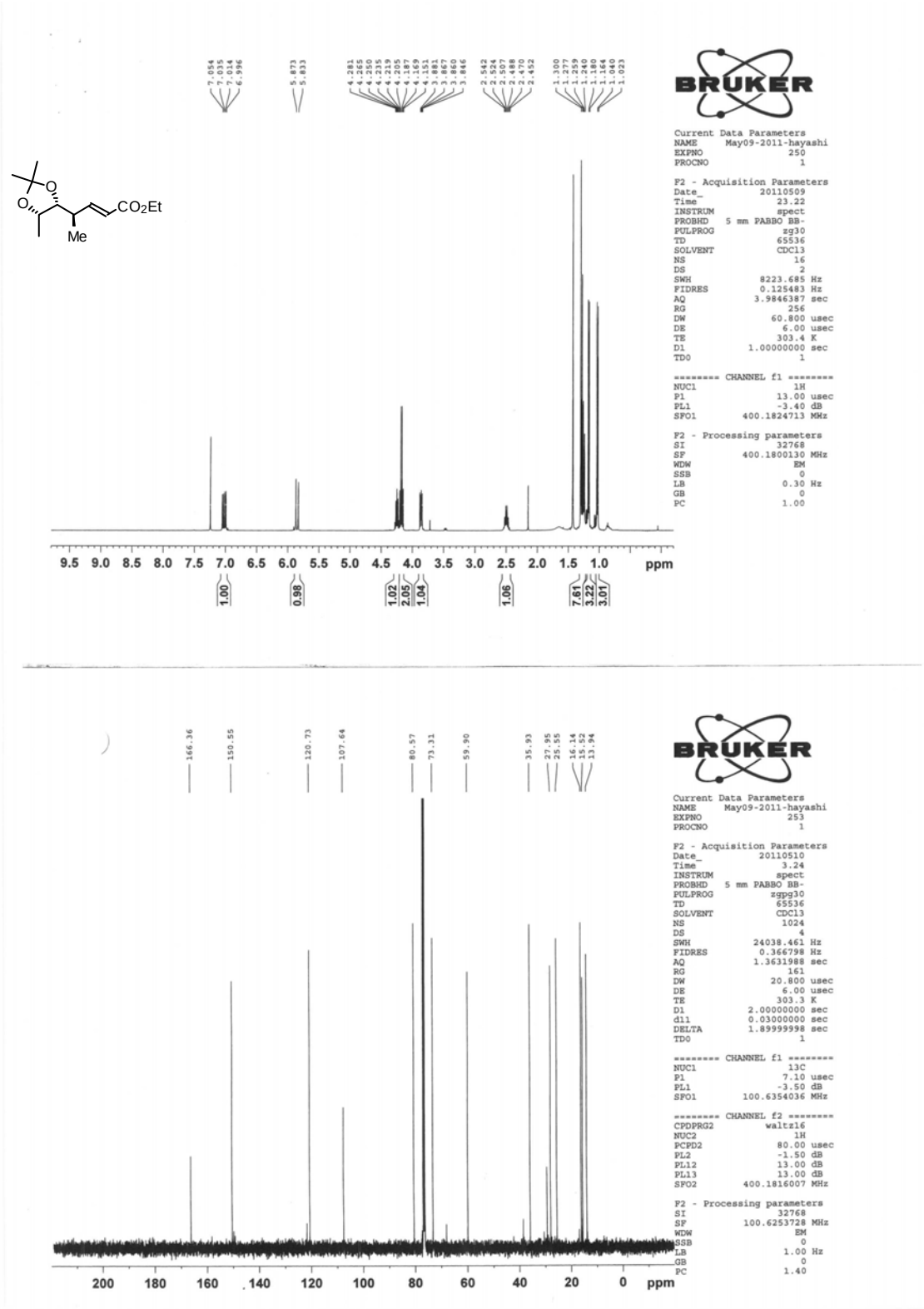


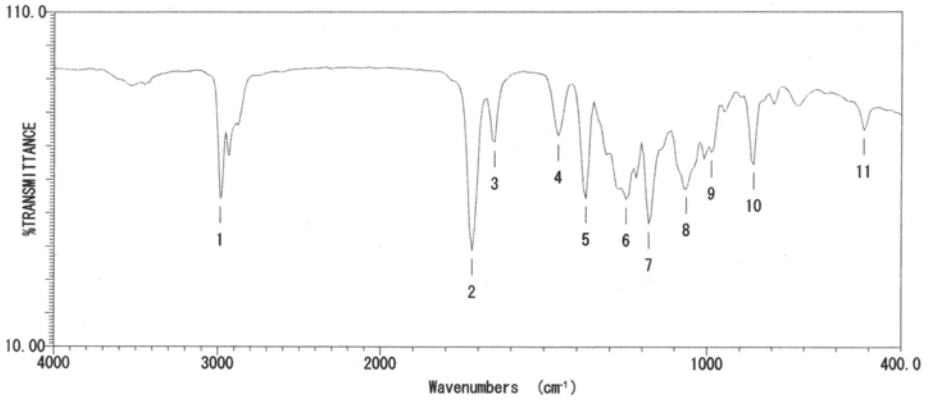
ファイル名	PlantRed
タイトル	
測定日時	2011年05月06日 09時50分55秒
測定分解能	16 cm-1
スキャン回数	16 回
測定ゲイン	1
コメント	

ピーク番号	波数(cm-1)	透過率(%)
01	3417.24	99.6763
02	2969.84	103.219
03	1704.76	85.0386
04	1650.77	98.3438
05	1457.92	101.183
06	1373.07	97.2511
07	1280.50	92.3461
08	1187.94	92.1598
09	1041.37	93.6951
10	995.089	93.3657
11	771.387	94.0449



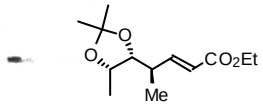
Eq. 3

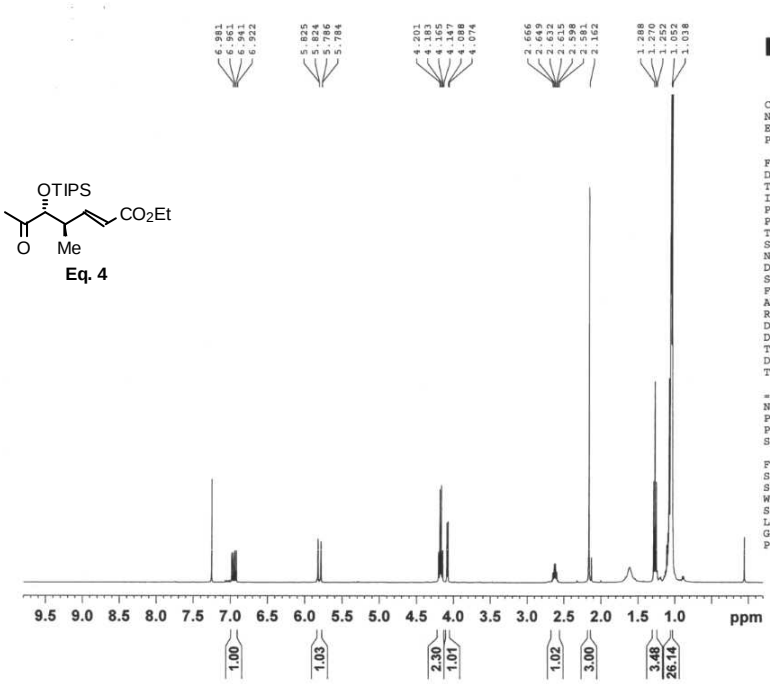

7.054
7.035
7.014
6.996
5.873
5.833
4.281
4.265
4.250
4.235
4.219
4.205
4.187
4.169
4.151
3.881
3.867
3.860
3.846
2.542
2.524
2.507
2.488
2.470
2.452
1.300
1.277
1.259
1.240
1.180
1.164
1.040
1.023
O
O
CO2Et
Me
BRUKER
Current Data Parameters
NAME May09-2011-hayashi
EXPNO 250
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110509
Time 23.22
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 256
DW 60.800 usec
DE 6.00 usec
TE 303.4 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 13.00 usec
PL1 -3.40 dB
SFO1 400.1824713 MHz
F2 - Processing parameters
SI 32768
SF 400.1800130 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 ppm
1.00
0.98
1.02
2.05
1.04
1.06
7.61
3.22
3.01
166.36
150.55
120.73
107.64
80.57
73.31
59.90
35.93
27.95
25.55
16.14
15.52
13.94
BRUKER
Current Data Parameters
NAME May09-2011-hayashi
EXPNO 253
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110510
Time 3.24
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1024
DS 4
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631988 sec
RG 161
DW 20.800 usec
DE 6.00 usec
TE 303.3 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 7.10 usec
PL1 -3.50 dB
SFO1 100.6354036 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -1.50 dB
PL12 13.00 dB
PL13 13.00 dB
SFO2 400.1816007 MHz
F2 - Processing parameters
SI 32768
SF 100.6253728 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
200 180 160 140 120 100 80 60 40 20 0 ppm



ファイル名 : K0Pantwa
タイトル :
測定日時 : 2011年06月11日 16時24分23秒
測定分解能 : 16 cm-1
スキャン回数 : 16 回
測定ゲイン : 1
コメント :

ピーク番号	波数(cm-1)	透過率(%)
01	2985.27	54.2788
02	1720.19	38.7665
03	1650.77	71.1079
04	1457.92	73.1094
05	1373.07	54.5094
06	1249.65	54.1458
07	1180.22	46.8072
08	1064.51	57.3504
09	987.375	68.2024
10	856.239	64.5100
11	516.829	74.8386

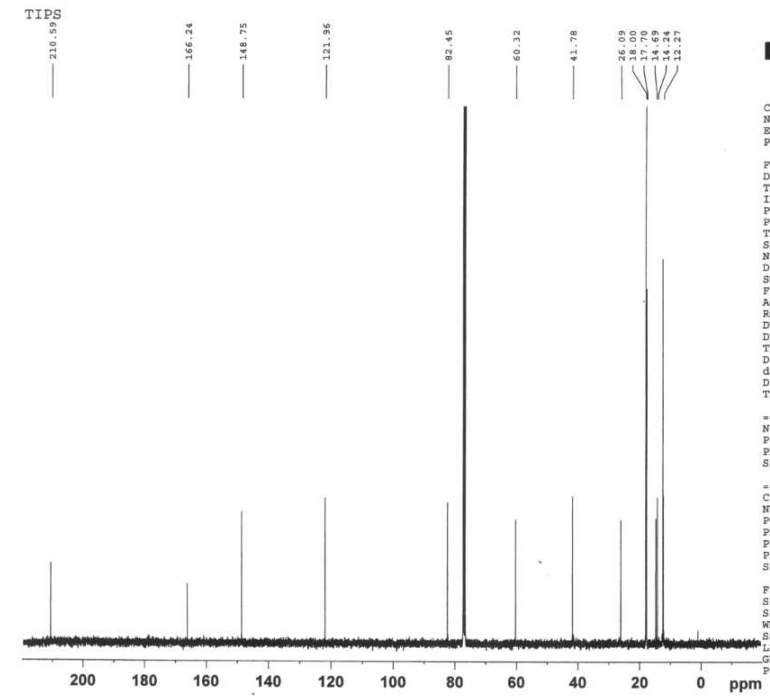




Eq. 4

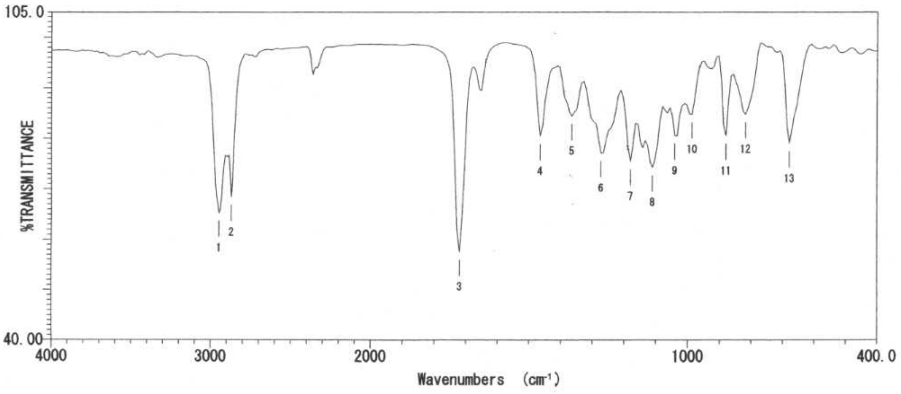
BRUKER

```
Current Data Parameters
NAME        Jun10-2011-hayashi
EXPNO                       20
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20110610
Time                     13.41
INSTRUM                  spect
PROBHD   5 mm PABBO BB-
PULPROG                  zg30
TD                      65536
SOLVENT                 CDCl3
NS                        128
DS                          0
SWH                  8223.685 Hz
FIDRES               0.125483 Hz
AQ                   3.9846387 sec
RG                        203
DW                    60.800 usec
DE                     6.00 usec
TE                     294.7 K
D1                 2.00000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                       1H
P1                    13.00 usec
PL1                    -3.40 dB
SFO1            400.1824713 MHz

F2 - Processing parameters
SI                        32768
SF               400.1800108 MHz
WDW                          EM
SSB                           0
LB                     0.30 Hz
GB                            0
PC                         1.00
```



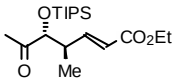
BRUKER

```
Current Data Parameters
NAME        Jun11-2011-hayashi
EXPNO                       20
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20110611
Time                      8.03
INSTRUM                  spect
PROBHD   5 mm PABBO BB-
PULPROG                zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                       1024
DS                          4
SWH                 24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631988 sec
RG                         50.8
DW                    20.800 usec
DE                     6.00 usec
TE                     296.0 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                      13C
P1                     7.10 usec
PL1                    -3.50 dB
SFO1            100.6354036 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                 80.00 usec
PL2                    -1.50 dB
PL12                   13.00 dB
PL13                   13.00 dB
SFO2            400.1816007 MHz

F2 - Processing parameters
SI                        32768
SF               100.6253417 MHz
WDW                          EM
SSB                           0
LB                     1.00 Hz
GB                            0
PC                         1.40
```

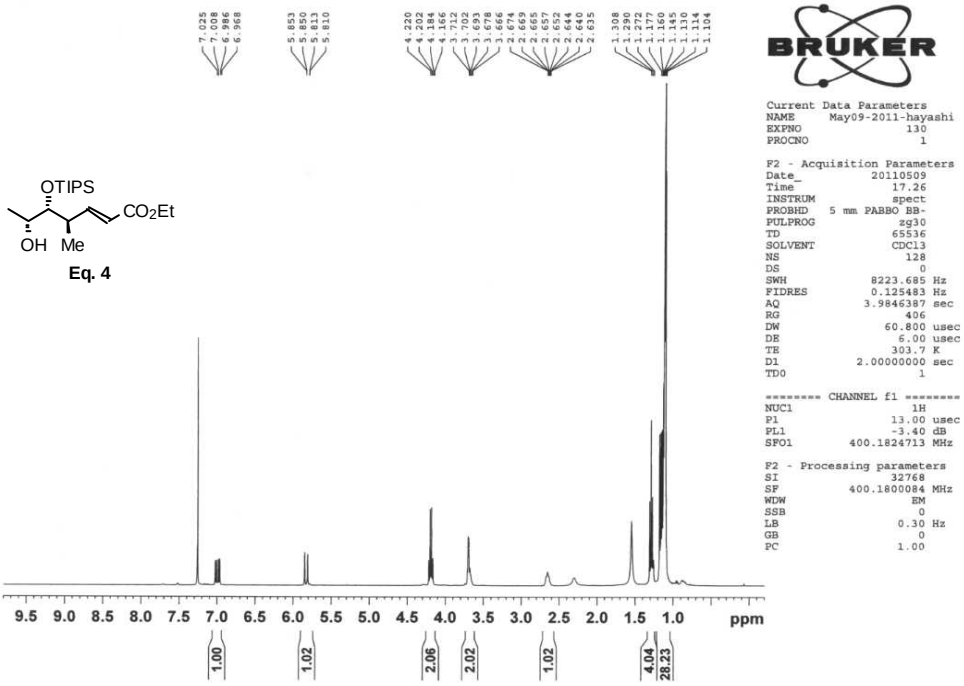


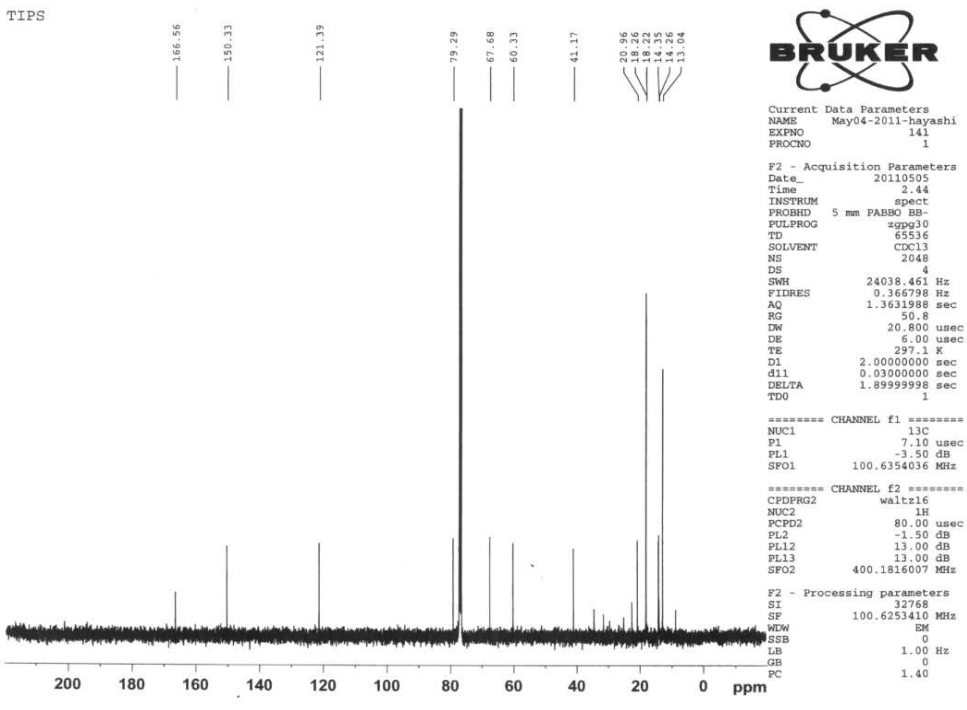
ファイル名	KOJPITIP
タイトル	
測定日時	2011年06月16日 22時17分56秒
測定分解能	16 cm-1
スキャン回数	16 回
測定ゲイン	1
コメント	

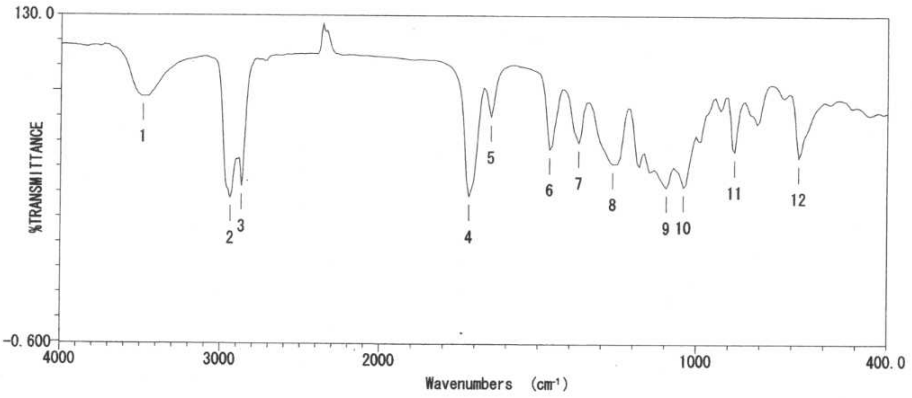
ピーク番号	波数(cm-1)	透過率(%)
01	2946.70	65.2522
02	2869.56	68.4372
03	1720.19	57.5587
04	1465.63	80.5311
05	1365.35	84.4852
06	1272.79	77.1421
07	1180.22	75.4931
08	1110.80	74.3496
09	1041.37	80.6235
10	987.375	84.8726
11	879.381	80.5913
12	817.670	84.8792
13	678.820	79.0684



Eq. 4

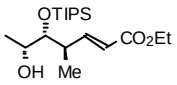

OTIPS
CO2Et
OH Me
Eq. 4
7.025
7.008
6.986
6.968
5.853
5.850
5.813
5.810
4.220
4.202
4.184
4.166
3.722
3.702
3.693
3.678
3.666
3.654
2.669
2.665
2.657
2.652
2.644
2.640
2.635
1.308
1.290
1.272
1.177
1.160
1.145
1.130
1.114
1.104
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 ppm
1.00
1.02
2.06
2.02
1.02
4.04
28.23
BRUKER
Current Data Parameters
NAME May09-2011-hayashi
EXPNO 130
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110509
Time 17.26
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 128
DS 0
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 406
DW 60.800 usec
DE 6.00 usec
TE 303.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 13.00 usec
PL1 -3.40 dB
SFO1 400.1824713 MHz
F2 - Processing parameters
SI 32768
SF 400.1800084 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00


TIPS
166.56
150.31
121.39
79.29
67.68
60.33
41.17
20.96
18.26
18.22
14.35
14.26
13.04
200 180 160 140 120 100 80 60 40 20 0 ppm
BRUKER
Current Data Parameters
NAME May04-2011-hayashi
EXPNO 141
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110505
Time 2.44
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 2048
DS 4
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631988 sec
RG 50.8
DW 20.800 usec
DE 6.00 usec
TE 297.1 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 7.10 usec
PL1 -3.50 dB
SFO1 100.6354036 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -1.50 dB
PL12 13.00 dB
PL13 13.00 dB
SFO2 400.1816007 MHz
F2 - Processing parameters
SI 32768
SF 100.6253410 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

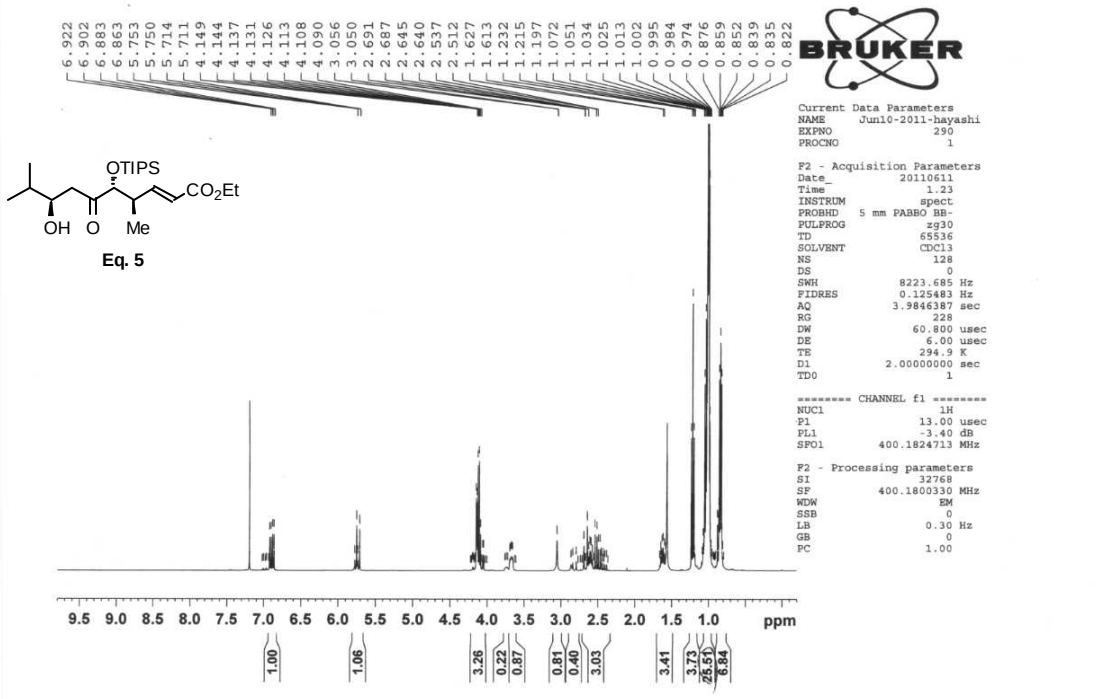


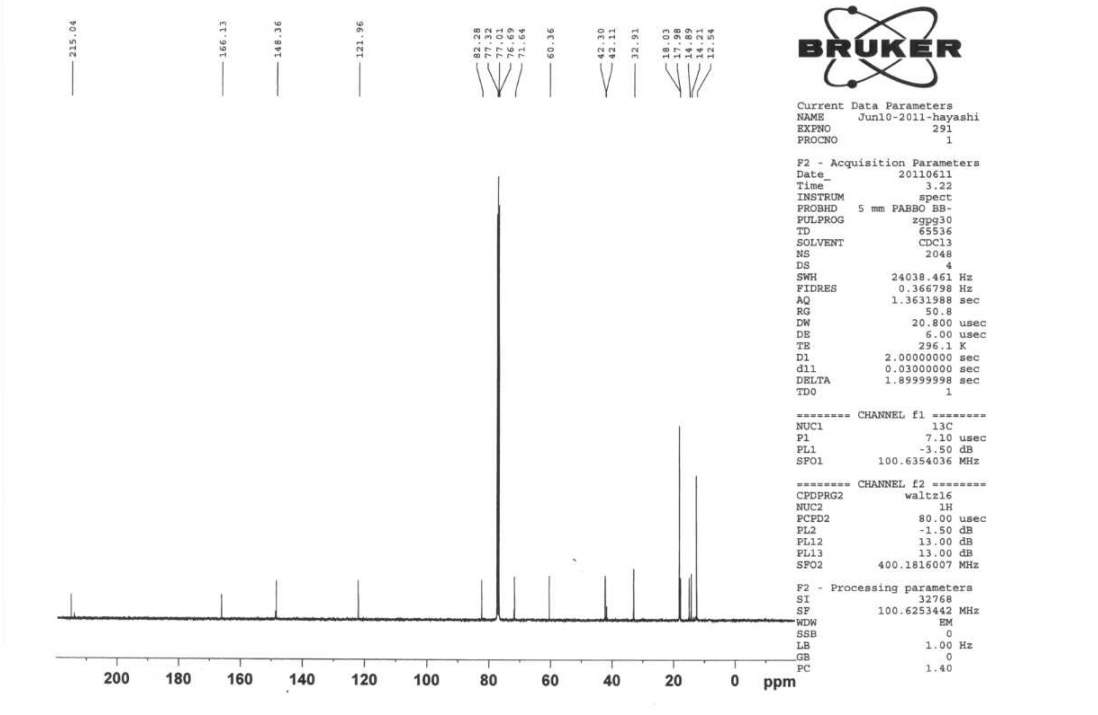
ファイル名	KojTIPOH
タイトル	
測定日時	2011年05月06日 09時22分19秒
測定分解能	16 cm-1
スキャン回数	16 回
測定ゲイン	1
コメント	

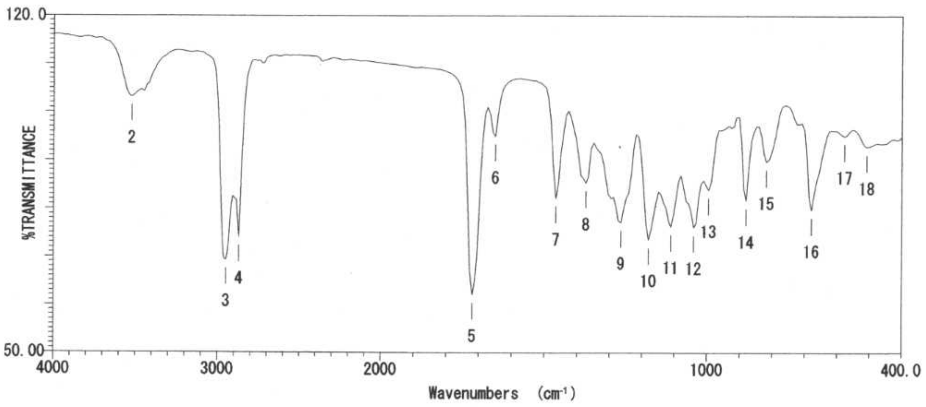
ピーク番号	波数(cm-1)	透過率(%)
01	3486.67	97.6610
02	2938.98	57.5221
03	2869.56	62.1408
04	1720.19	58.2041
05	1650.77	89.7827
06	1465.63	76.9960
07	1373.07	79.6586
08	1265.07	71.3047
09	1095.37	61.9716
10	1041.37	62.2820
11	879.381	76.1259
12	678.820	73.7313



Eq. 4

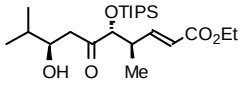

6.922
6.902
6.883
6.863
5.753
5.750
5.714
5.711
4.149
4.144
4.137
4.131
4.126
4.113
4.108
4.090
3.056
3.050
2.691
2.687
2.645
2.640
2.537
2.512
1.627
1.613
1.232
1.215
1.197
1.072
1.051
1.034
1.025
1.013
1.002
0.995
0.984
0.974
0.876
0.859
0.852
0.839
0.835
0.822
OTIPS
CO2Et
OH O Me
Eq. 5
BRUKER
Current Data Parameters
NAME Jun10-2011-hayashi
EXPNO 290
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110611
Time 1.23
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 128
DS 0
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 228
DW 60.800 usec
DE 6.00 usec
TE 294.9 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 13.00 usec
PL1 -3.40 dB
SFO1 400.1824713 MHz
F2 - Processing parameters
SI 32768
SF 400.1800330 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 ppm
1.00
1.06
3.26
0.22
0.87
0.81
0.40
3.03
3.41
3.73
25.51
6.84


215.04
166.13
148.36
121.96
82.28
77.32
77.01
76.69
71.64
60.36
42.30
42.11
32.91
18.03
17.88
14.89
14.21
12.54
BRUKER
Current Data Parameters
NAME Jun10-2011-hayashi
EXPNO 291
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110611
Time 3.22
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 2048
DS 4
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631988 sec
RG 50.8
DW 20.800 usec
DE 6.00 usec
TE 296.1 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 7.10 usec
PL1 -3.50 dB
SFO1 100.6354036 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -1.50 dB
PL12 13.00 dB
PL13 13.00 dB
SFO2 400.1816007 MHz
F2 - Processing parameters
SI 32768
SF 100.6253442 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
200 180 160 140 120 100 80 60 40 20 0 ppm

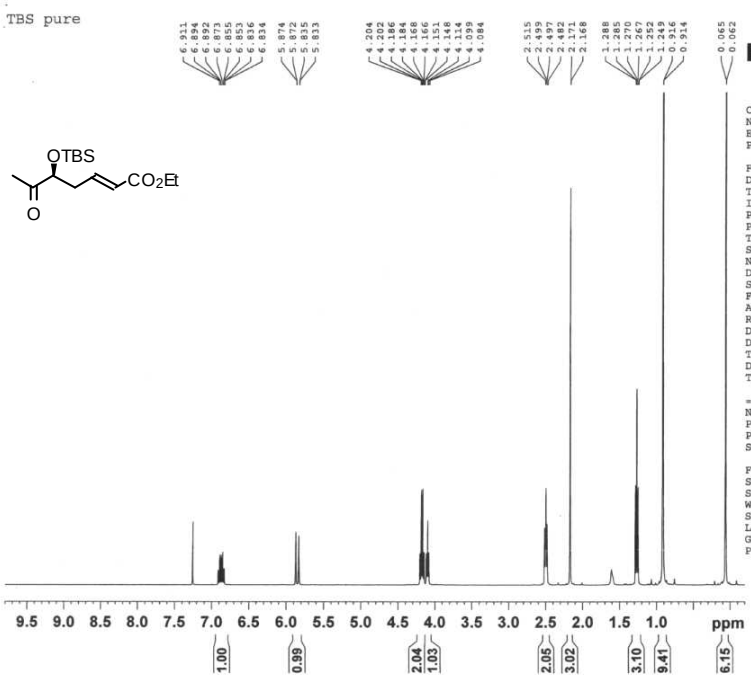


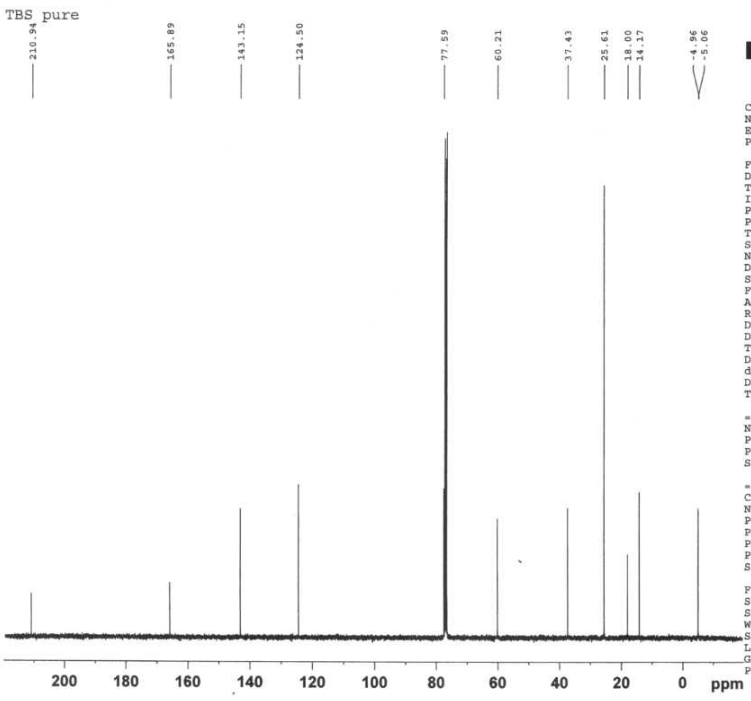
ファイル名 :
タイトル :
測定日時 : 2011年06月11日 14時57分04秒
測定分解能 : 16 cm-1
スキャン回数 : 16 回
測定ゲイン : 1
コメント :

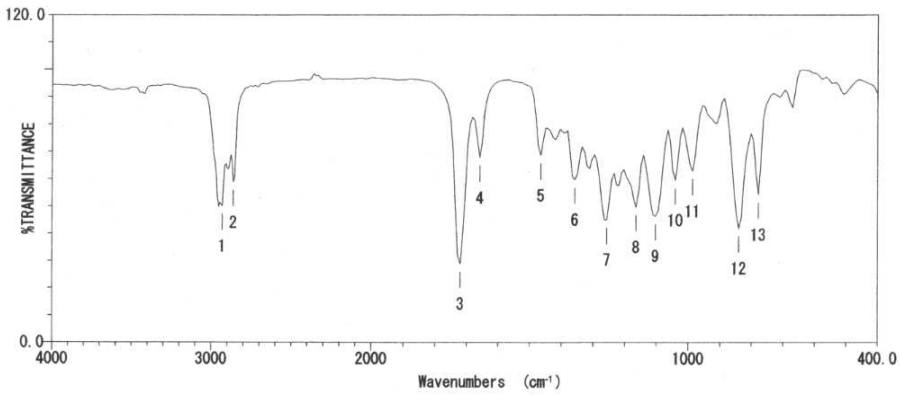
ピーク番号	波数(cm-1)	透過率(%)	ピーク番号	波数(cm-1)	透過率(%)
01	4327.48	115.732	18	509.115	92.9623
02	3525.24	103.227			
03	2946.70	69.3217			
04	2869.56	74.1074			
05	1720.19	62.0819			
06	1650.77	95.0368			
07	1465.63	82.2741			
08	1373.07	85.4348			
09	1265.07	77.2739			
10	1180.22	73.6392			
11	1110.80	76.3884			
12	1041.37	76.2447			
13	995.089	83.9974			
14	879.381	81.7640			
15	817.670	89.8310			
16	678.820	79.8187			
17	578.540	95.1682			



Eq. 5

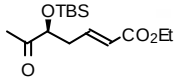

TBS pure
OTBS
CO2Et
O
BRUKER
Current Data Parameters
NAME May28-2011-hayashi
EXPNO 170
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110528
Time 21.10
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 128
DS 0
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 181
DW 60.800 usec
DE 6.00 usec
TE 303.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 13.00 usec
PL1 -3.40 dB
SFO1 400.1824713 MHz
F2 - Processing parameters
SI 32768
SF 400.1800088 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 ppm
1.00 0.99 2.04 1.03 2.05 3.02 3.10 9.41 6.15

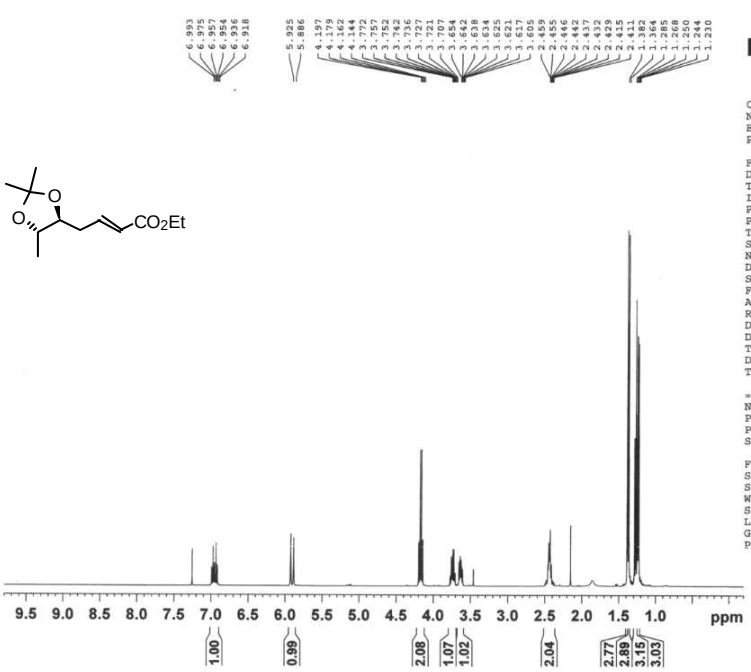

TBS pure
210.94 165.89 143.15 124.50 77.59 60.21 37.43 25.61 18.00 14.17 -4.96 -5.06
BRUKER
Current Data Parameters
NAME May28-2011-hayashi
EXPNO 171
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110528
Time 22.11
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1024
DS 4
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631988 sec
RG 50.8
DW 20.800 usec
DE 6.00 usec
TE 303.5 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 7.10 usec
PL1 -3.50 dB
SFO1 100.6354036 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -1.50 dB
PL12 13.00 dB
PL13 13.00 dB
SFO2 400.1816007 MHz
F2 - Processing parameters
SI 32768
SF 100.6253459 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
200 180 160 140 120 100 80 60 40 20 0 ppm



ファイル名 : KOJP1TBS
タイトル :
測定日時 : 2011年06月11日 16時39分30秒
測定分解能 : 16 cm-1
スキャン回数 : 16 回
測定ゲイン : 1
コメント :

ピーク番号	波数(cm-1)	透過率(%)
01	2931.27	50.1632
02	2861.84	58.8036
03	1720.19	28.8916
04	1658.48	67.8010
05	1465.63	68.6378
06	1357.64	59.7688
07	1257.36	45.1201
08	1164.79	49.8030
09	1103.08	46.4245
10	1041.37	59.5722
11	987.375	62.9289
12	840.812	41.9622
13	779.101	54.2788





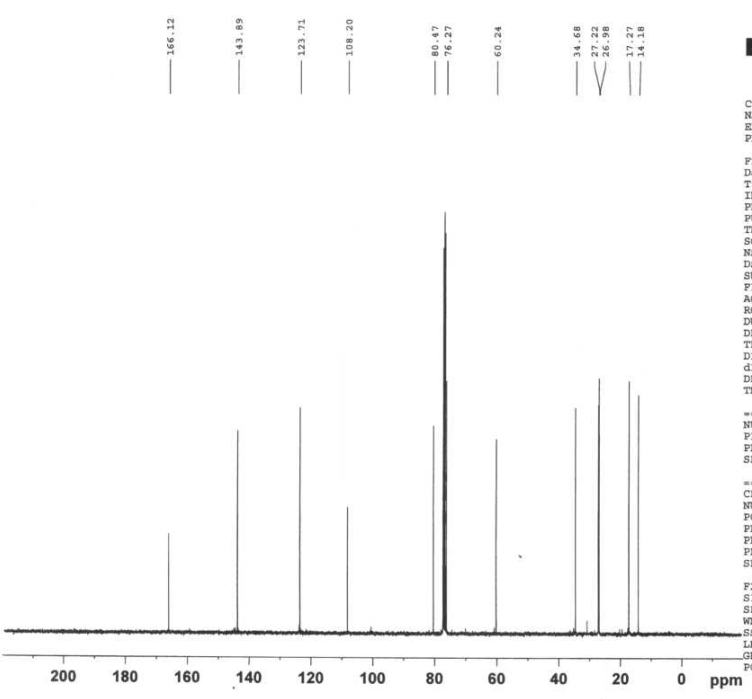
BRUKER

Current Data Parameters
NAME Jun11-2011-hayashi
EXPNO 30
PROCNO 1

F2 - Acquisition Parameters
Date_ 20110611
Time 8.22
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 128
DS 0
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 90.5
DW 60.800 usec
DE 6.00 usec
TE 294.8 K
D1 2.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 13.00 usec
PL1 -3.40 dB
SFO1 400.1824713 MHz

F2 - Processing parameters
SI 32768
SF 400.1800088 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



BRUKER

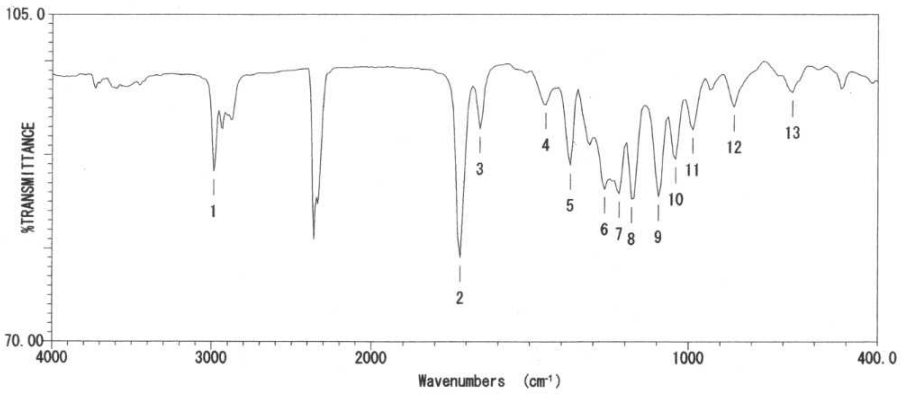
Current Data Parameters
NAME Jun11-2011-hayashi
EXPNO 31
PROCNO 1

F2 - Acquisition Parameters
Date_ 20110611
Time 9.23
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1024
DS 4
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631988 sec
RG 50.8
DW 20.800 usec
DE 6.00 usec
TE 296.3 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1

======== CHANNEL f1 ========
NUC1 13C
P1 7.10 usec
PL1 -3.50 dB
SFO1 100.6354036 MHz

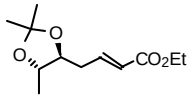
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -1.50 dB
PL12 13.00 dB
PL13 13.00 dB
SFO2 400.1816007 MHz

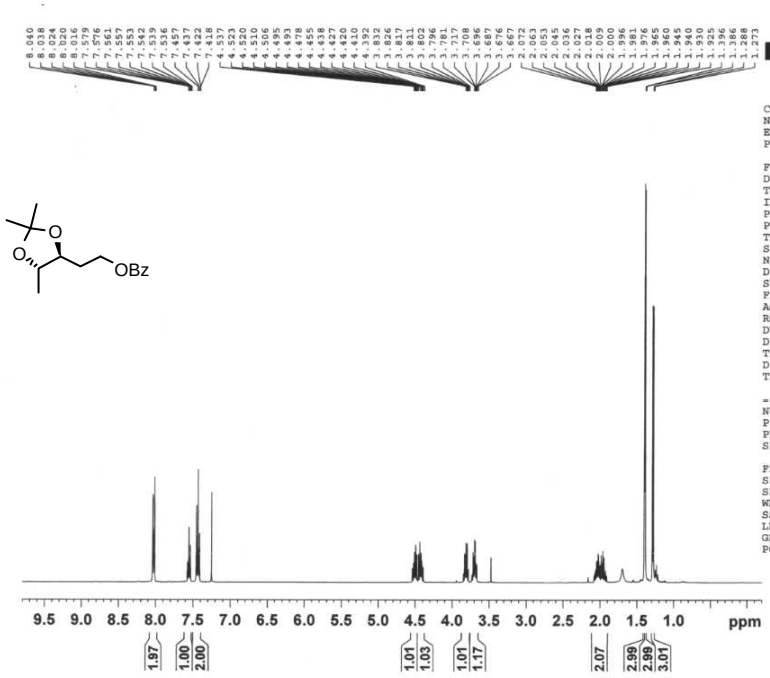
F2 - Processing parameters
SI 32768
SF 100.6253479 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40



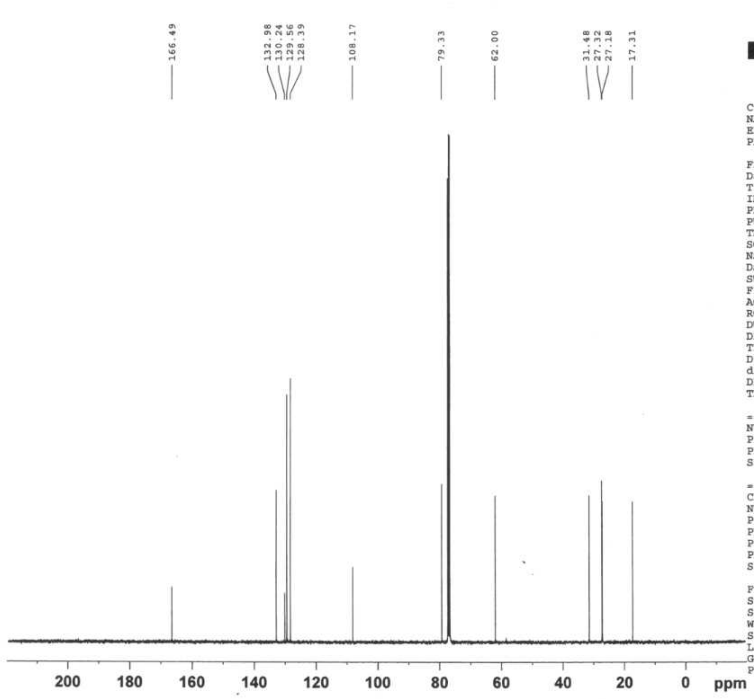
ファイル名 : KOJZkan
タイトル :
測定日時 : 2011年06月11日 16時47分45秒
測定分解能 : 16 cm-1
スキャン回数 : 16 回
測定ゲイン : 1
コメント :

ピーク番号	波数(cm-1)	透過率(%)
01	2985.27	88.2323
02	1720.19	78.9932
03	1658.48	92.7987
04	1450.21	95.3723
05	1373.07	88.9004
06	1265.07	86.3415
07	1218.79	85.8369
08	1180.22	85.3017
09	1095.37	85.5300
10	1041.37	89.5373
11	987.375	92.6941
12	856.239	95.1081
13	671.106	96.6706

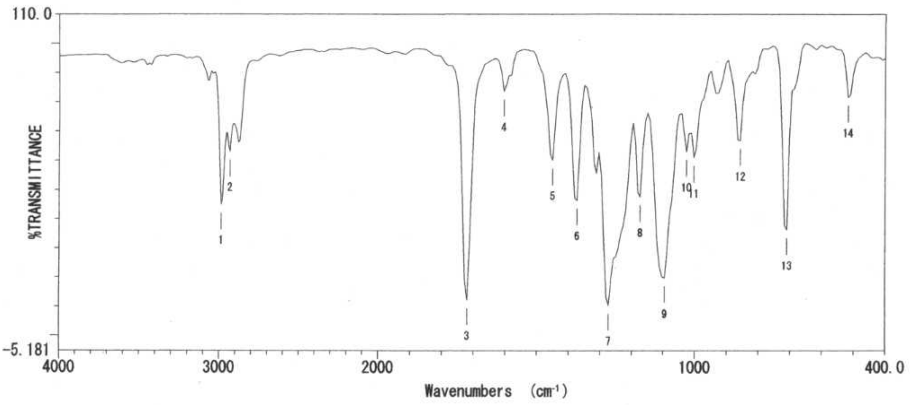





```
Current Data Parameters
NAME        Jun12-2011-hayashi
EXPNO                       50
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20110612
Time                     20.11
INSTRUM                  spect
PROBHD    5 mm PABBO BB-
PULPROG                  zg30
TD                      65536
SOLVENT                 CDCl3
NS                        128
DS                          0
SWH                  8223.685 Hz
FIDRES               0.125483 Hz
AQ                   3.9846387 sec
RG                        203
DW                     60.800 usec
DE                      6.00 usec
TE                     294.6 K
D1                   2.00000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                        1H
P1                      13.00 usec
PL1                     -3.40 dB
SFO1                400.1824713 MHz

F2 - Processing parameters
SI                        32768
SF                  400.1800102 MHz
WDW                          EM
SSB                          0
LB                        0.30 Hz
GB                           0
PC                        1.00
```




```
Current Data Parameters
NAME        Jun12-2011-hayashi
EXPNO                       51
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20110612
Time                     22.11
INSTRUM                  spect
PROBHD    5 mm PABBO BB-
PULPROG                 zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                         2048
DS                            4
SWH                 24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631988 sec
RG                         50.8
DW                     20.800 usec
DE                      6.00 usec
TE                     296.1 K
D1                   2.00000000 sec
d11                  0.03000000 sec
DELTA                1.89999998 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                       13C
P1                      7.10 usec
PL1                     -3.50 dB
SFO1                100.6354036 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                        1H
PCPD2                  80.00 usec
PL2                     -1.50 dB
PL12                    13.00 dB
PL13                    13.00 dB
SFO2                400.1816007 MHz

F2 - Processing parameters
SI                        32768
SF                  100.6253410 MHz
WDW                          EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```



ファイル名 :
タイトル :
測定日時 : 2011年06月16日 22時10分25秒
測定分解能 : 16 cm-1
スキャン回数 : 16 回
測定ゲイン : 1
コメント :

ピーク番号	波数(cm-1)	透過率(%)
01	2985.27	44.8838
02	2931.27	63.0303
03	1720.19	12.2167
04	1604.48	83.6925
05	1450.21	60.1925
06	1373.07	46.3926
07	1272.79	10.3404
08	1172.51	47.5186
09	1095.37	19.7162
10	1025.94	63.0785
11	1002.80	61.0461
12	856.239	66.8169
13	709.676	36.2383
14	516.829	81.7170