Supporting Information for

Catalytic Enantioselective Desymmetrization of *meso* Cyclic Anhydrides via Iridium–Catalyzed Hydrogenation **

Tang-Lin Liu, Wei Li, Huiling Geng, Chun-Jiang Wang, Xumu Zhang**

[*]T.-L. Liu, H. Geng, Prof. Dr. C.-J. Wang and Prof. X. Zhang

College of Chemistry and Molecular Sciences

Wuhan University, Wuhan, Hubei, 430072 P. R. China

E-mail: cjwang@whu.edu.cn

[*]T.-L. Liu, Dr. W. Li and Prof. X. Zhang

Department of Chemistry and Chemical Biology & Department of Pharmaceutical Chemistry

Rutgers, the State University of New Jersey. Piscataway, NJ 08854, USA

E-mail: xumu@rci.rutgers.edu

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General Remarks.

General Information Unless otherwise noted, all reagents and solvents were purchased from commercial suppliers and used without further purification. NMR spectra were recorded on 400 MHz for ^1H NMR and 100 MHz for ^{13}C NMR. CDCl_3 was the solvent used for the NMR analysis, with tetramethylsilane as the internal standard. Chemical shifts were reported upfield to TMS (0.00 ppm) for ^1H NMR and relative to CDCl_3 (77.0 ppm) for ^{13}C NMR. Optical rotation was determined using a Perkin Elmer 343 polarimeter. GC analysis was performed with an Agilent

7890A GC System. HPLC analysis was conducted on an Agilent 1200 Series instrument. Column chromatography was performed with silica gel Merck 60 (230-400 mesh).

General procedure of the hydrogenation: A stock solution of $[\text{Ir}(\text{COD})\text{Cl}]_2$ (COD=cycloocta-1,5-diene) and C_3^* -DTBM-TunePhos in a 1:2.2 molar ratio was stirred in EtOAc at room temperature for 30 min in a nitrogen-filled glovebox. The catalyst solution (0.1 mL, 0.0001 mmol) was then transferred by syringe into the vials charged with different substrates (0.1 mmol) in EtOAc (1 mL). All the vials were placed in a steel autoclave, into which hydrogen gas (80 bar) was introduced. After stirring at 80 or 125 $^\circ\text{C}$ for 20 h, the hydrogen was released, the solution was concentrated, and then the crude reaction mixture was eluted (EtOAc) through a short column of silica gel to remove the metal complex. The purified product mixture was analyzed by chiral GC or chiral HPLC to determine the *ee* value.

(3aR,6aS)-1,3-dibenzyltetrahydro-1H-furo[3,4-d]imidazole-2,4-dione^[1] (3)

The title compound was prepared according to the general procedure as described above in >99% conversion, 96% yield. ^1H NMR (CDCl_3 , TMS, 400 MHz) δ 7.38-7.24 (m, 10H), 5.04 (d, J = 14.8 Hz, 1H), 4.62 (d, J = 15.2 Hz, 1H), 4.62 (dd, J = 7.2 Hz, 14.8 Hz, 2H), 4.15-4.10 (m, 3H), 3.92 (d, J = 8.8 Hz, 1H); ^{13}C NMR (CDCl_3 , TMS, 100 MHz) δ 172.79, 158.31, 136.00, 135.89,

129.06, 128.84, 128.79, 128.61, 128.26, 128.14, 127.92, 54.45, 52.54, 46.99, 45.30; The product was analyzed by HPLC to determine the enantiomeric excess: 96% ee (Chiralcel OD-H, *i*-propanol/hexane = 30/70, flow rate 0.5 mL/min, λ = 220 nm); t_r = 25.85 and 36.15 min.

(3a*S*,7a*R*)-hexahydroisobenzofuran-1(3H)-one^[2] (10)

The title compound was prepared according to the general procedure as described above in >99% conversion, 94% yield. ¹H NMR (CDCl₃, TMS, 400 MHz) δ 4.20 (dd, J = 4.8 Hz, 8.8 Hz, 1H), 3.96 (dd, J = 1.2 Hz, 8.8 Hz, 1H), 2.65-2.64 (m, 1H), 2.48 (m, 1H), 2.11-2.10 (m, 2H), 1.68-1.59 (m, 4H), 1.35-1.21 (m, 4H); ¹³C NMR (CDCl₃, TMS, 100 MHz) δ 177.45, 70.71, 38.49, 34.43, 26.19, 22.44, 21.95, 21.51; The product was analyzed by GC to determine the enantiomeric excess: 91% ee (Beta Dex 225 column, 150 °C, 1.0 mL/min.); t_r = 12.78 and 14.60 min.

(3a*S*,7a*R*)-5,6-dimethylhexahydroisobenzofuran-1(3H)-one (13)

The title compound was prepared according to the general procedure as described above in >99% conversion, 93% yield. ¹H NMR (CDCl₃, TMS, 400 MHz) δ 4.31 (dd, J = 5.6 Hz, 8.8 Hz, 1H), 3.97 (dd, J = 2.4 Hz, 8.8 Hz, 1H), 2.77-2.74 (m, 1H), 2.69-2.63 (m, 1H), 2.38-1.85 (m, 4H), 1.66 (d, J = 8.0 Hz, 6H); ¹³C NMR (CDCl₃, TMS, 100 MHz) δ 179.67, 70.96, 41.77, 36.24, 27.09, 25.67, 24.85, 24.56, 21.60, 19.74; The product was analyzed by GC to determine the enantiomeric excess: 94% ee (Gama Dex 120 column, 140 °C, 1.0 mL/min.); t_r = 39.94 and 40.23 min.

(3a*S*,6a*R*)-hexahydro-1*H*-cyclopenta[*c*]furan-1-one^[3] (15)

The title compound was prepared according to the general procedure as described above in >99% conversion, 97% yield. ¹H NMR (CDCl₃, TMS, 400 MHz) δ 4.46 (dd, *J* = 8.0 Hz, 9.2 Hz, 1H), 3.99 (dd, *J* = 2.4 Hz, 9.2 Hz, 1H), 3.01-2.95 (m, 2H), 2.08-1.43 (m, 6H); ¹³C NMR (CDCl₃, TMS, 100 MHz) δ 181.05, 73.58, 44.49, 38.98, 33.74, 30.68, 25.49; The product was analyzed by GC to determine the enantiomeric excess: 80% ee (Beta Dex 225 column, 150 °C, 1.0 mL/min.); *t_r* = 14.11 and 19.05 min.

(3a*S*,4*R*,7*S*,7a*R*)-hexahydro-4,7-methanoisobenzofuran-1(3*H*)-one^[4] (17)

The title compound was prepared according to the general procedure as described above in >99% conversion, 92% yield. ¹H NMR (CDCl₃, TMS, 400 MHz) δ 4.32-4.22 (m, 2H), 3.00-2.95 (m, 1H), 2.90-2.86 (m, 1H), 2.67-2.66 (m, 1H), 2.37-2.36 (m, 1H), 1.58-1.48 (m, 6H); ¹³C NMR (CDCl₃, TMS, 100 MHz) δ 177.69, 67.39, 45.76, 41.00, 40.94, 39.43, 38.86, 24.45, 20.57; The product was analyzed by GC to determine the enantiomeric excess: 87% ee (Beta Dex 225 column, 150 °C, 1.0 mL/min.); *t_r* = 35.75 and 37.27 min.

(3a*S*,4*S*,7*R*,7a*R*)-hexahydro-4,7-ethanoisobenzofuran-1(3*H*)-one^[5] (19)

The title compound was prepared according to the general procedure as described above in >99% conversion, 98% yield. ¹H NMR (CDCl₃, TMS, 400 MHz) δ 4.44 (dd, *J* = 8.8 Hz, 16.8 Hz, 1H), 4.20 (dd, *J* = 3.2 Hz, 9.6 Hz, 1H), 2.68-2.66 (m, 2H), 2.07-2.06 (m, 1H), 1.71-1.53 (m, 9H); ¹³C NMR (CDCl₃, TMS, 100 MHz) δ 179.88, 70.92, 41.78, 36.24, 27.09, 25.69, 24.85, 24.56, 21.60, 19.68; The product was analyzed by GC to determine the enantiomeric excess: 99% ee (Beta Dex 120 column, 170 °C, 1.0 mL/min.); *t_r* = 14.80 and 19.52 min.

References:

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- [3] I. J. Jakovac, H. B. Goodbrand, K. P Lok, J. B. Jones, *J. Am. Chem. Soc.* **1982**, 104, 4659.
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LTL-2-24-1
PROTON CDCl3 {E:\NMR Data} t1 50

7.384
7.367
7.363
7.351
7.346
7.344
7.337
7.333
7.324
7.320
7.316
7.309
7.303
7.293
7.284
7.275
7.270
7.260
7.257
7.251
7.240
5.054
5.017
4.641
4.603
4.393
4.369
4.356
4.331
4.158
4.155
4.148
4.134
4.121
4.112
4.103
3.932
3.910
2.055
2.035
1.271
1.253
1.235
0.000

NAME Jul20-2012-t1

EXPNO 7
PROCNO 1
Date_ 20120720
Time_ 21.31
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 64
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 161
DM 60.800 usec
DE 6.50 usec
TE 300.4 K
D1 1.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 8.76 usec
PL1 -2.00 dB
PL1W 31.17179108 W
SFO1 400.1324710 MHz
SI 32768
SE 400.1300107 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

LTL-2-24-1-C
C13CPD CDCl3 {E:\NMR Data} t1 50

172.794
158.305
136.001
135.886
129.058
128.840
128.788
128.608
128.256
128.135
127.922
77.370
77.052
76.734
70.167
54.454
52.538
46.988
45.301

NAME Jul20-2012-t1
EXPNO 8
PROCNO 1
Date_ 20120720
Time_ 22.31
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 2050
DM 20.800 usec
DE 6.50 usec
TE 301.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 8.50 usec
PL1 1.00 dB
PL1W 75.02186584 W
SFO1 100.6228298 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 2.00 dB
PL12 18.23 dB
PL13 19.00 dB
PL2W 31.17179108 W
PL12W 0.29563907 W
PL13W 0.24760634 W
SFO2 400.1316005 MHz
SI 32768
SF 100.6127685 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

NAME	JUL20-2012-t1
JEXENO	9
PROCNO	1
Date	20120720

O=C1OC2CCCCC2C1

=====	CHANNEL, f1	1H
NUC1		
P1	8.76	used
PL1	-2.00	dB
PLW	31.17179108	W
SFO1	400.1324710	MHz
SI	32768	
SF	400.1300040	MHz
MDW		EM
SSB		0
LB	0.30	Hz
GB	0	
GC	1.00

LTL-2-24-2-C
C13CPD CDCl3 {E:\NMR Data} t1 51

177.448

76.332
76.014
75.697
70.705

38.489
34.433
26.185
22.439
21.946
21.514

NAME Jul20-2012-t1
EXPNO 10
PROCNO 1
Date_ 20120720
Time_ 18.05
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
DS 1024
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631988 sec
RG 2050
DM 20.800 usec
DE 6.50 usec
TE 302.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 8.50 usec
PL1 1.00 dB
PL1W 75.02186584 W
SFO1 100.6228298 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 2.00 dB
PL12 18.23 dB
PL13 19.00 dB
PL2W 31.17179108 W
PL12W 0.29563907 W
PL13W 0.24760634 W
SFO2 400.1316005 MHz
ST 32768
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GC 1.40

LTI-2-64B
PROTON CDCl3 {E:\NMR Data} t1 46

4.323
4.309
4.301
4.288
3.986
3.980
3.964
3.958
2.770
2.763
2.750
2.743
2.668
2.662
2.653
2.649
2.644
2.630
2.381
2.317
2.315
2.155
2.150
2.124
2.121
1.913
1.897
1.888
1.867
1.849
1.668
1.648
1.646
1.259
0.930
0.901
0.891
0.885
0.876
0.873
0.851
0.833
0.820
0.808

NAME No09-2012-t1
EXPNO 3
PROCNO 1
Date_ 20121109
Time_ 13.17
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 32
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 144
DM 60.800 usec
DE 6.50 usec
TE 298.2 K
D1 1.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 8.76 usec
PL1 -2.00 dB
PL1W 31.17179108 W
SFO1 400.1324710 MHz
SI 32768
SE 400.1300040 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

LTL-2-64B-C
C13CPD32 CDCl3 {E:\NMR Data\} t1 46

179.668

13

77.352
77.034
76.717
70.958

41.770
36.237
27.085
25.668
24.850
24.557
21.603
19.743

NAME Nov09-2012-t1
EXPNO 2
PROCNO 1
Date_ 20121109
Time_ 17.10
INSTRUM spect
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PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 512
DS 2
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631988 sec
RG 2050
DM 20.800 usec
DE 6.50 usec
TE 301.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 8.50 usec
PL1 1.00 dB
PL1W 75.02186584 W
SFO1 100.6228298 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 2.00 dB
PL12 18.23 dB
PL13 19.00 dB
PL2W 31.17179108 W
PL12W 0.29563907 W
PL13W 0.24760634 W
SFO2 400.1316005 MHz
ST 39768
SF 100.6127690 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

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NAME	JUL16-2012-CL
EXENO	7
PROCNO	1
Date	20120716

15

=====	CHANNEL f1	1H
NR1	8.76	usec
PI	-2.00	db
PI1	31.17179108	M
PIW	400.1324710	MHz
SI	32768	
SE	400.1300075	MHz
NMW	EM	
NSB	0	
LB	0.30	Hz
GB	0	
PC	1.00

LTL-2-13-6-C
C13CPD CDCl3 {E:\NMR Data} t1 8

181.049

77.407
77.089
76.770
73.576

44.486
38.980
33.743
30.682
25.488

NAME Aug29-2012-t1
EXPNO 7
PROCNO 1
Date_ 20120829
Time_ 21.04
INSTRUM spect
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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 2050
DM 20.800 usec
DE 6.50 usec
TE 303.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 8.50 usec
PL1 1.00 dB
PL1W 75.02186584 W
SFO1 100.6228298 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 2.00 dB
PL12 18.23 dB
PL13 19.00 dB
PL2W 31.17179108 W
PL12W 0.29563907 W
PL13W 0.24760634 W
SFO2 400.1316005 MHz
SI 32768
SF 100.6127690 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

LTL-2-24-3
 PROTON CDCl3 {E:\NMR Data} t1 52

NAME Jul20-2012-t1
 EXPNO 11
 PROCNO 1
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 Time_ 22.45
 INSTRUM spect
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 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 32
 DS 2
 SWH 8223.685 Hz
 FIDRES 0.125483 Hz
 AQ 3.9846387 sec
 RG 181
 DW 60.800 usec
 DE 6.50 usec
 TE 300.2 K
 D1 1.00000000 sec
 TD0 1

===== CHANNEL f1 =====
 NUC1 1H
 P1 8.76 usec
 PL1 -2.00 dB
 PL1W 31.17179108 W
 SFO1 400.1324710 MHz
 SI 32768
 SE 400.1300042 MHz
 WDW EM
 SSB 0
 GB 0.30 Hz
 PC 1.00

LTL-2-24-3-C
C13CPD CDCl3 {E:\NMR Data} t1 52

177.694

76.352
76.034
75.717
67.387

45.757
41.004
40.937
39.429
38.861
24.452
20.567

NAME Jul20-2012-t1
EXPNO 12
PROCNO 1
Date_ 20120720
Time_ 19.08
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 2050
DM 20.800 usec
DE 6.50 usec
TE 302.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 8.50 usec
PL1 1.00 dB
PL1W 75.02186584 W
SFO1 100.6228298 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 2.00 dB
PL12 18.23 dB
PL13 19.00 dB
PL2W 31.17179108 W
PL12W 0.29563907 W
PL13W 0.24760634 W
SFO2 400.1316005 MHz
SI 32768
SF 100.6128689 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

LTL-2-64C
PROTON CDCl3 {E:\NMR Data\ t1 47

NAME Nov09-2012-t1
EXPNO 1
PROCNO 1
Date_ 2012102
Time 11.52
INSTRUM spect
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PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 32
DS 2
SWH 823.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 161
RG 60.800 usec
DE 25.00 usec
TE 300.2 K
D1 1.0000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 8.16 usec
PL1 -2.00 dB
PL1W 31.17179108 W
SFO1 400.1324710 MHz
SI 32768
SF 400.1300035 MHz
WDW EM
SSB 0
GB 0
PC 1.00

LTL-2-64C-C
C13CPD32 CDCl3 {E:\NMR Data} t1 47

179.875

77.352
77.034
76.717
70.915

41.779
36.237
27.085
25.688
24.850
24.557
21.603
19.678

NAME Nov09-2012-t1
EXPNO 12
PROCNO 1
Date_ 20121109
Time 17:10
INSTRUM spect
PROBHD 5 mm PABO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 312
DS 4
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FIDRES 0.366798 Hz
AQ 1.361398 sec
RG 2050
RW 20.800 usec
DE 30.49 usec
TE 300.2 K
D1 2.0000000 sec
D11 0.0300000 sec
TD0 1

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PL1 1.00 dB
PL1W 75.02186584 W
SFO1 100.628298 MHz

===== CHANNEL f2 =====
GEORG2 VALL214
MHC2 1H
PCPG2 90.00 usec
PL2 -2.00 dB
PL12 18.23 dB
PL13 18.00 dB
PL1W 31.1212209 W
PL1M 0.2462209 M
PL1W 0.2466634 W
SFO2 400.131605 MHz
SI 32768
SF 100.6127690 MHz
WDW EN
SSB 0
GB 1.00 Hz
PC 1.40

Data File C:\CHEM32\1\DATA\LTL\LTL-13-1000001.D
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                                           Inj Volume : 2 µl
Acq. Method     : C:\CHEM32\1\METHODS\ODH-30-70-05-220.M
Last changed    : 1/30/2012 6:14:43 PM by LTL
Analysis Method : C:\CHEM32\1\DATA\LTL\LTL-13-1000001.D\DA.M (ODH-30-70-05-220.M)
Last changed    : 7/20/2012 11:33:04 AM by XZ
                  (modified after loading)
Sample Info     : LTL-13-1
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Area Percent Report

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Sorted By      : Signal
Multiplier     : 1.0000
Dilution       : 1.0000
Use Multiplier & Dilution Factor with ISTDs
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Signal 1: WMD1 A, Wavelength=220 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height [mAU]	Area %
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2	32.586	BB	2.1694	3.22630e4	208.99203	49.9405

Totals : 6.46028e4 463.33913

*** End of Report ***

Data File C:\CHEM32\1\DATA\LTL\LTL-2-24-100001.D
Sample Name: LTL-2-24-1

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Acq. Instrument : Instrument 1          Location : Vial 52
Injection Date  : 7/21/2012 11:09:06 AM
                                           Inj Volume : 2 µl
Acq. Method     : C:\CHEM32\1\METHODS\ODH-30-70-05-220.M
Last changed    : 7/21/2012 11:37:33 AM by LTL
                  (modified after loading)
Analysis Method : C:\CHEM32\1\DATA\LTL\LTL-2-24-100001.D\DA.M (ODH-30-70-05-220.M)
Last changed    : 8/26/2012 12:42:08 PM by LSK
                  (modified after loading)
Sample Info     : LTL-2-24-1, OD-H, HEX:IPR=70:30, 220NM, 1MIN/ML
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Area Percent Report

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=====
Sorted By      : Signal
Multiplier     : 1.0000
Dilution       : 1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: WVD1 A, Wavelength=220 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height [mAU]	Area %
1	25.851	BB	1.8795	4.17840e4	306.63101	98.4005
2	36.152	MM	2.2079	679.21191	5.12711	1.5995

Totals : 4.24632e4 311.75812

*** End of Report ***

Data File C:\CHEM32\1\DATA\LTL\LTL-2-13-200001.D
Sample Name: LTL-2-13-2

```
=====
Acq. Operator   : LTL
Acq. Instrument : GC7890                      Location : Vial 10
Injection Date  : 7/17/2012 11:14:14 AM      Inj Volume : External
Acq. Method     : C:\CHEM32\1\METHODS\BETA-225-1500C-25MIN.M
Last changed    : 7/17/2012 11:08:13 AM by LTL
Analysis Method : C:\CHEM32\1\METHODS\OVERNIGHT.M
Last changed    : 7/17/2012 3:31:39 PM by LTL
                  (modified after loading)
Sample Info     : LTL-2-13-2, BETA-225,150 OC 25MIN, 2uL, 1mL/min
=====
```

Area Percent Report

```
=====
Sorted By      : Signal
Multiplier     : 1.0000
Dilution       : 1.0000
Sample Amount   : 1.00000 [mg/L] (not used in calc.)
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: FID1 A, Front Signal

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	12.777	BV	0.1645	531.77710	44.14301	49.58611
2	14.603	BB	0.2085	540.65442	32.49796	50.41389
Totals :				1072.43152	76.64096	

*** End of Report ***

Data File C:\CHEM32\1\DATA\LTL\LTL-2-29-300001.D
Sample Name: LTL-2-29-3

```
=====
Acq. Operator   : LTL
Acq. Instrument : GC7890                      Location : Vial 10
Injection Date  : 8/4/2012 11:25:40 AM
                                           Inj Volume : External
Acq. Method     : C:\CHEM32\1\METHODS\BETA-225-1500C-25MIN.M
Last changed    : 8/4/2012 10:59:05 AM by CMX
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\16-X.M
Last changed    : 8/4/2012 12:15:38 PM by LTL
                  (modified after loading)
Sample Info     : LTL-2-29-3, BETA-225,150 oC, 1ML/MIN, 25MIN
=====
```

Area Percent Report

```
=====
Sorted By      : Signal
Multiplier     : 1.0000
Dilution       : 1.0000
Sample Amount  : 1.00000 [mg/L] (not used in calc.)
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: FID1 A, Front Signal

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	12.587	BV	0.1567	783.78424	64.98504	95.39994
2	14.703	MM	0.1438	37.79303	4.38119	4.60006
Totals :				821.57727	69.36623	

*** End of Report ***

Data File C:\CHEM32\1\DATA\LTL\LTL-2-62B000050.D
Sample Name: LTL-2-62B

```
=====
Acq. Operator   : LTL
Acq. Instrument : GC7890                      Location : Vial 4
Injection Date  : 11/7/2012 12:20:47 PM
                                           Inj Volume : External
Acq. Method     : C:\CHEM32\1\METHODS\BETA-120-1400C-200MIN.M
Last changed    : 11/7/2012 12:16:13 PM by LTL
Analysis Method : C:\CHEM32\1\METHODS\BETA-120-1400C-200MIN.M
Last changed    : 11/11/2012 3:10:02 PM by LTL
                  (modified after loading)
Sample Info     : LTL-2-62B, Beta120, 140C, 1ML/MIN
=====
```

Area Percent Report

```
=====
Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Sample Amount  :      1.00000 [mg/L] (not used in calc.)
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: FID1 A, Front Signal

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	39.829	BV	0.2655	82.67277	4.74948	49.37702
2	40.257	VB	0.2783	84.75890	4.68497	50.62298
Totals :				167.43166	9.43445	

*** End of Report ***

Data File C:\CHEM32\1\DATA\LTL\LTL-2-64B000055.D
Sample Name: LTL-2-64B

```
=====
Acq. Operator   : LTL
Acq. Instrument : GC7890                      Location : Vial 8
Injection Date  : 11/9/2012 4:18:15 PM
                                           Inj Volume : External
Acq. Method     : C:\CHEM32\1\METHODS\BETA-120-1400C-200MIN.M
Last changed    : 11/7/2012 12:16:13 PM by LTL
Analysis Method : C:\CHEM32\1\METHODS\BETA-120-1400C-200MIN.M
Last changed    : 11/11/2012 3:11:38 PM by LTL
                  (modified after loading)
Sample Info     : LTL-2-64B, Beta120, 140C, 1ML/MIN
=====
```

Area Percent Report

```
=====
Sorted By      : Signal
Multiplier     : 1.0000
Dilution       : 1.0000
Sample Amount  : 1.00000 [mg/L] (not used in calc.)
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: FID1 A, Front Signal

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	39.936	MF	0.1850	36.01166	3.24512	3.10609
2	40.228	FM	0.3068	1123.37634	61.03107	96.89391

Totals : 1159.38800 64.27619

*** End of Report ***

Data File C:\CHEM32\1\DATA\LTL\LTL-2-13-600009.D
Sample Name: LTL-2-13-6

```
=====
Acq. Operator   : LTL
Acq. Instrument : GC7890                      Location : Vial 7
Injection Date  : 7/17/2012 6:14:10 PM
                                           Inj Volume : External
Acq. Method     : C:\CHEM32\1\METHODS\BETA-225-1500C-25MIN.M
Last changed    : 7/17/2012 6:09:53 PM by LTL
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\OVERNIGHT.M
Last changed    : 7/18/2012 11:51:36 AM by LTL
                  (modified after loading)
Sample Info     : LTL-2-13-6, BETA-225,150 OC , 2uL, 1mL/min
=====
```

Area Percent Report

```
=====
Sorted By      : Signal
Multiplier     : 1.0000
Dilution       : 1.0000
Sample Amount  : 1.00000 [mg/L] (not used in calc.)
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: FID1 A, Front Signal

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	14.551	MM	0.2058	266.53815	21.58477	53.01618
2	18.955	MM	0.3375	236.21053	11.66311	46.98382
Totals :				502.74867	33.24788	

*** End of Report ***

Data File C:\CHEM32\1\DATA\LTL\LTL 2012-07-23 14-03-15\003F0101.D
Sample Name: LTL-2-25-5

```
=====
Acq. Operator   : LTL                               Seq. Line :    1
Acq. Instrument : GC7890                           Location  : Vial 3
Injection Date  : 7/23/2012 2:05:09 PM              Inj       :    1
                                                    Inj Volume: External
Acq. Method     : C:\Chem32\1\DATA\LTL\LTL 2012-07-23 14-03-15\BETA-225-1500C-25MIN.M
Last changed    : 7/23/2012 2:03:15 PM by LTL
Analysis Method : C:\CHEM32\1\METHODS\16-X.M
Last changed    : 7/23/2012 2:59:39 PM by LSD
                  (modified after loading)
=====
```

Area Percent Report

```
=====
Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: FID1 A, Front Signal

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	14.107	MM	0.4420	1209.49829	45.61128	89.06216
2	19.045	MM	0.2832	148.54012	8.74204	10.93784
Totals :				1358.03841	54.35332	

*** End of Report ***

Data File C:\CHEM32\1\DATA\LTL\LTL-2-13-300006.D
Sample Name: LTL-2-13-3

```
=====
Acq. Operator   : LTL
Acq. Instrument : GC7890                      Location : Vial 9
Injection Date  : 7/17/2012 2:19:29 PM
                                           Inj Volume : External
Acq. Method     : C:\CHEM32\1\METHODS\BETA-225-1500C-25MIN.M
Last changed    : 7/17/2012 2:15:08 PM by LTL
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\OVERNIGHT.M
Last changed    : 7/18/2012 11:53:15 AM by LTL
                  (modified after loading)
Sample Info     : LTL-2-13-3, BETA-225,140 OC , 2uL, 1mL/min
=====
```

Area Percent Report

```
=====
Sorted By      : Signal
Multiplier     : 1.0000
Dilution       : 1.0000
Sample Amount  : 1.00000 [mg/L] (not used in calc.)
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: FID1 A, Front Signal

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	35.745	BV	0.4371	727.89484	20.63814	49.53190
2	37.265	VB	0.5866	741.65277	15.60274	50.46810
Totals :				1469.54761	36.24088	

*** End of Report ***

Data File C:\CHEM32\1\DATA\LTL\LTL-2-29-200003.D
Sample Name: LTL-2-29-2

```
=====
Acq. Operator   : LTL
Acq. Instrument : GC7890
Injection Date  : 8/4/2012 12:56:46 PM
Location       : Vial 8
Inj Volume     : External
Acq. Method    : C:\CHEM32\1\METHODS\BETA-225-1400C-45MIN.M
Last changed   : 7/21/2012 12:09:51 PM by LTL
Analysis Method: C:\CHEM32\1\METHODS\16-X.M
Last changed   : 8/4/2012 2:06:24 PM by LTL
                (modified after loading)
Sample Info    : LTL-2-29-2, BETA-225,150 oC, 1ML/MIN, 45MIN
=====
```

Area Percent Report

```
=====
Sorted By      : Signal
Multiplier     : 1.0000
Dilution       : 1.0000
Sample Amount  : 1.00000 [mg/L] (not used in calc.)
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: FID1 A, Front Signal

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	35.519	BV	0.5520	1219.78223	26.70951	92.47763
2	37.997	VB	0.5678	99.22027	2.07386	7.52237

Totals : 1319.00249 28.78337

*** End of Report ***

Data File C:\CHEM32\1\DATA\LTL\LTL-2-62C000051.D
Sample Name: LTL-2-62C

```
=====
Acq. Operator   : LTL
Acq. Instrument : GC7890
Injection Date  : 11/7/2012 1:53:04 PM
Location        : Vial 3
Inj Volume      : External
Acq. Method     : C:\CHEM32\1\METHODS\BETA-120-1700C-200MIN.M
Last changed    : 10/15/2012 11:13:01 AM by LSK
Analysis Method : C:\CHEM32\1\METHODS\BETA-120-1400C-200MIN.M
Last changed    : 11/11/2012 3:04:37 PM by LTL
                  (modified after loading)
Sample Info     : LTL-2-62C, Beta120, 170C, 1ML/MIN
=====
```

Area Percent Report

```
=====
Sorted By      : Signal
Multiplier     : 1.0000
Dilution       : 1.0000
Sample Amount  : 1.00000 [mg/L] (not used in calc.)
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: FID1 A, Front Signal

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	14.813	MM	0.1144	198.67223	28.93324	46.30459
2	19.489	MM	0.1497	230.38289	25.64468	53.69541

Totals : 429.05511 54.57792

*** End of Report ***

Data File C:\CHEM32\1\DATA\LTL\LTL-2-64C000060.D
Sample Name: LTL-2-64C

```
=====
Acq. Operator   : LTL
Acq. Instrument : GC7890                      Location : Vial 7
Injection Date  : 11/10/2012 4:13:54 PM
                                           Inj Volume : External
Acq. Method     : C:\CHEM32\1\METHODS\BETA-120-1700C-200MIN.M
Last changed    : 11/10/2012 4:07:18 PM by LTL
Analysis Method : C:\CHEM32\1\METHODS\BETA-120-1400C-200MIN.M
Last changed    : 11/11/2012 3:07:08 PM by LTL
                  (modified after loading)
Sample Info     : LTL-2-64C, Beta120, 170C, 1ML/MIN
=====
```

Area Percent Report

```
=====
Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Sample Amount  :      1.00000 [mg/L] (not used in calc.)
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: FID1 A, Front Signal

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	14.800	BB	0.1034	2.72547	4.17140e-1	0.10642
2	19.516	BB	0.1471	2558.25391	270.59009	99.89358

Totals : 2560.97938 271.00723

*** End of Report ***