Asymmetric Synthesis and Absolute Configuration of (+)- and (−)-Perhexiline

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Supporting Information

Contents

1H and 13C NMR spectra.................................................................S2
HPLC chromatogram......................................................................S8
$^1$H NMR (400 MHz, CDCl$_3$)

$^{13}$C NMR (100.6 MHz, CDCl$_3$)
$^1$H NMR (400 MHz, CDCl$_3$)

$^{13}$C NMR (100.6 MHz, CDCl$_3$)
$^1$H NMR (400 MHz, CDCl$_3$)

$^{13}$C NMR (100.6 MHz, CDCl$_3$)
$^1$H NMR (400 MHz, CDCl$_3$)

$^{13}$C NMR (100.6 MHz, CDCl$_3$)
$^1$H NMR (400 MHz, CDCl$_3$)

$^{13}$C NMR (100.6 MHz, CDCl$_3$)
$^1$H NMR (400 MHz, CDCl₃)

$^{13}$C NMR (100.6 MHz, CDCl₃)
$^1$H NMR (400 MHz, CDCl$_3$; N.B. rotamers present at 298K)
HPLC chromatogram

rac-PHX-Bz

Data File: C:\CHEM32\1\DATA\TSENG\RAC-PHX-BZ_03MAR15_2.D
Sample Name: RAC-PHX-BZ_03Mar15_2

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Acq. Operator : Jimy
Acq. Instrument : Instrument 1
Location : Vial 11
Injection Date : 3/3/2015 12:39:01 PM
Inj Volume : 3.0 µl

Acq. Method : C:\CHEM32\1\METHODS\PHX-IA.M
Last changed : 3/3/2015 12:32:53 PM by Jimy (modified after loading)

Analysis Method : C:\CHEM32\1\METHODS\DIRECTMS.M
Last changed : 3/3/2015 1:47:28 PM by manuele (modified after loading)

Method Info : Direct MS

Sample Info : RAC-PHX-BZ_03Mar15_2 (ChiralPak IA, 4.6 x 250 mm, 5um,
IPA : nHex = 3 : 97 @ 0.6 mL/min)

------------------------------------------------------------------------

Area Percent Report

Sorted By : Signal
Multiplier: 1.0000
Dilution: 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: DAD1 B, Sig=220,16 Ref=360,100

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Totals : 1.10993e4 | 351.67316

S8
Table 1, entry 1: (S)-PHX-Bz

Data File: C:\CHEM32\DATA\T2EINS\TZCC-144-S-PHX-BZ_FDOH2-BA-1.D
Sample Name: TZCC-144-S-PHX-BZ_FDOH2-BA-1

Acq. Operator: Jimmy
Acq. Instrument: Instrument 1
Injection Date: 3/3/2015 2:54:55 PM
Inj Volume: 2.0 µl

Last changed: 3/3/2015 2:50:32 PM by Jimmy
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Analysis Method: C:\CHEM32\METHODS\DIRECTMS.M
Last changed: 3/27/2015 9:33:08 AM by manuele
(modified after loading)

Method Info: Direct MS

Sample Info: TZCC-144-S-PHX-BZ_FDOH2-BA-1 (ChiralPak IA, 4.6 x 250 mm, 5µm, IPA : nHex = 3 : 97 @ 0.6 mL/min)
Data File: C:\CHEM32\DATA\TSENG\ZTCC-59-R-PHX-BZ_03MAR15_1.D
Sample Name: ZTCC-59-R-PHX-BZ_03MAR15_1

Acq. Operator: Jimmy
Acq. Instrument: Instrument 1
Injection Date: 3/3/2015 1:45:38 PM
Injection Volume: 3.0 µl

Acq. Method: C:\CHEM32\1\METHODS\PHX-IA.M
Last changed: 3/3/2015 1:06:02 PM by Jimmy
(modified after loading)

Analysis Method: C:\CHEM32\1\METHODS\DIRECTMS.M
Last changed: 3/3/2015 1:47:28 PM by manuele
(modified after loading)

Method Info: Direct MS

Sample Info: ZTCC-59-R-PHX-BZ_03MAR15_1 (ChiralPak IA, 4.6 x 250 mm,
3µm, IPA: nHex = 3 : 97 @ 0.6 mL/min)

Area Percent Report

Sorted By: Signal
Multiplier: 1.0000
Dilution: 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: DAD1 B, Sig-220,16 Ref-360,100

Peak RetTime Type Width Area Height Area
min [min] [min] [mAU’s] [mAU] %

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Totals: 2.23057e4 696.65520

S10
Table 1, entry 2: (S)-PHX-Bz

Data File: C:\CHEM32\DATA\TSENQ\ZTCC-144-S-PHX-BZ_PTO2_2.d
Sample Name: ZTCC-144-S-PHX-BZ_PTO2_2

Acq. Operator: Jimy
Acq. Instrument: Instrument 1
Injection Date: 3/3/2015 4:00:28 PM
Injection Volume: 6.0 μl

Acq. Method: C:\CHEM32\DATA\TSENQ\METHODS\PHX-IA.M
Last changed: 3/3/2015 3:51:21 PM by Jimy (modified after loading)

Analysis Method: C:\CHEM32\DATA\TSENQ\METHODS\DIRECTSMS.M
Last changed: 3/3/2015 3:12:34 PM by manuele (modified after loading)

Method Info: Direct MS

Sample Info: ZTCC-144-S-PHX-BZ_PTO2_2 (ChiralPak IA, 4.6 x 250 mm, 5 um, IPA: nHex = 3 : 97 @ 0.6 mL/min)

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Area Percent Report

Sorted By: Signal
Multiplier: 1.0000
Dilution: 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: DAD1 B, Sig=220.16 Ref=360.100 (TSENQ\ZTCC-144-S-PHX-BZ_PTO2_2.d)

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Totals: 9525.19379 293.07233
Table 1, entry 3: (S)-PHX-Bz

Data File C:\CHEM32\DATA\YSEN6\ZTCC-144-S-PHX-BZ_PD-C.D
Sample Name: ZTCC-144-S-PHX-BZ_Pd-C

Acq. Operator : Jimy
Acq. Instrument : Instrument 1
Injection Date : 3/3/2015 4:41:39 PM
Injection Volume : 2.0 µl

Analysis Method : C:\CHEM32\METHODS\DIRECTMS.M
Last changed : 3/3/2015 3:12:34 PM by manuele
(modified after loading)

Method Info : Direct MS
Sample Info : ZTCC-144-S-PHX-BZ_Pd-C (ChiralPak IA, 4.6 x 250 mm, 5µm,
IPA : nHex = 3 : 97 @ 0.6 ml/min)

Area Percent Report

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: DAD1 B, Sig=220,16 Ref=360,100

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Totals : 1.37457e4 451.72960
Table 1, entry 4: (S)-PHX-Bz

Data File: C:\CHEM32\DATA\TSEN\ZTCC-144-S-PHX-BZ_PD(OH)2-BA-2_2.D
Sample Name: ZTCC-144-S-PHX-BZ_PD(OH)2-BA-2_2

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Area Percent Report

Sorted By: Signal
Multiplier: 1.0000
Dilution: 1.0000

Signal 1: DAD1 B, Sig=220,16 Ref=360,100

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Totals: 1.19939e4 363.56446
(R)-PHX-HCl (N.B. detection as the form of benzamide derivative)