Electronic supplementary materials *Mendeleev Commun*., 2010, **20**, 104-105

Cinchona alkaloid ester derivatives as ligands in the asymmetric dihydroxylation and aminohydroxylation of alkenes

Hui Chen, Qiao Feng Wang, Xiao Li Sun, Jing Luo and Ru Jiang

Chiral HPLC analysis of diols:

(1) 1,2-Diphenyl-1,2-ethanediol. Daicel Chiralcel OJ-H. hexane/^{i}PrOH=90/10. flow rate=0.5 ml/min. t_R(min)=28.1 (major), 31.3 (minor);

(2) Ethyl-2,3-Dihydroxy-3-phenylpropionate. Daicel Chiralcel OJ-H. hexane/^{i}PrOH =90/10. flow rate=1.0ml/min. t_R(min)=15.1(major), 19.8 (minor);

(3) Methyl-2,3-Dihydroxy-3-phenylpropionate. Daicel Chiralcel OJ-H. hexane/^{i}PrOH =90/10. flow rate=1.0ml/min. t_R(min)=23.7(major), 31.1 (minor);

(4) 1-phenyl-1,2-propanediol. Daicel Chiralcel OD-H. hexane/^{i}PrOH=97/3. flow rate=0.8 ml/min. t_R(min)=31.4 (minor), 33.8(major);

(5) 2-phenyl-1,2-propanediol. Daicel Chiralcel OJ-H. hexane/^{i}PrOH=90/10. flow rate=1.0 ml/min. t_R(min)=10.5 (major), 13.6(minor);

(6) 1-phenyl-1,2-ethanediol. Daicel Chiralcel OB-H. hexane/^{i}PrOH=90/10. flow rate=0.5 ml/min. t_R(min)=15.3 (minor), 18.4 (major);

(7) 3-(*α*-naphthoxy)-1,2-propanediol. Daicel Chiralcel OD-H. hexane/^{i}PrOH =90/10. flow rate=1.0ml/min. t_R(min)=24.9(major), 30.7 (minor).

Chiral HPLC analysis of amino alcohols (table 2) :

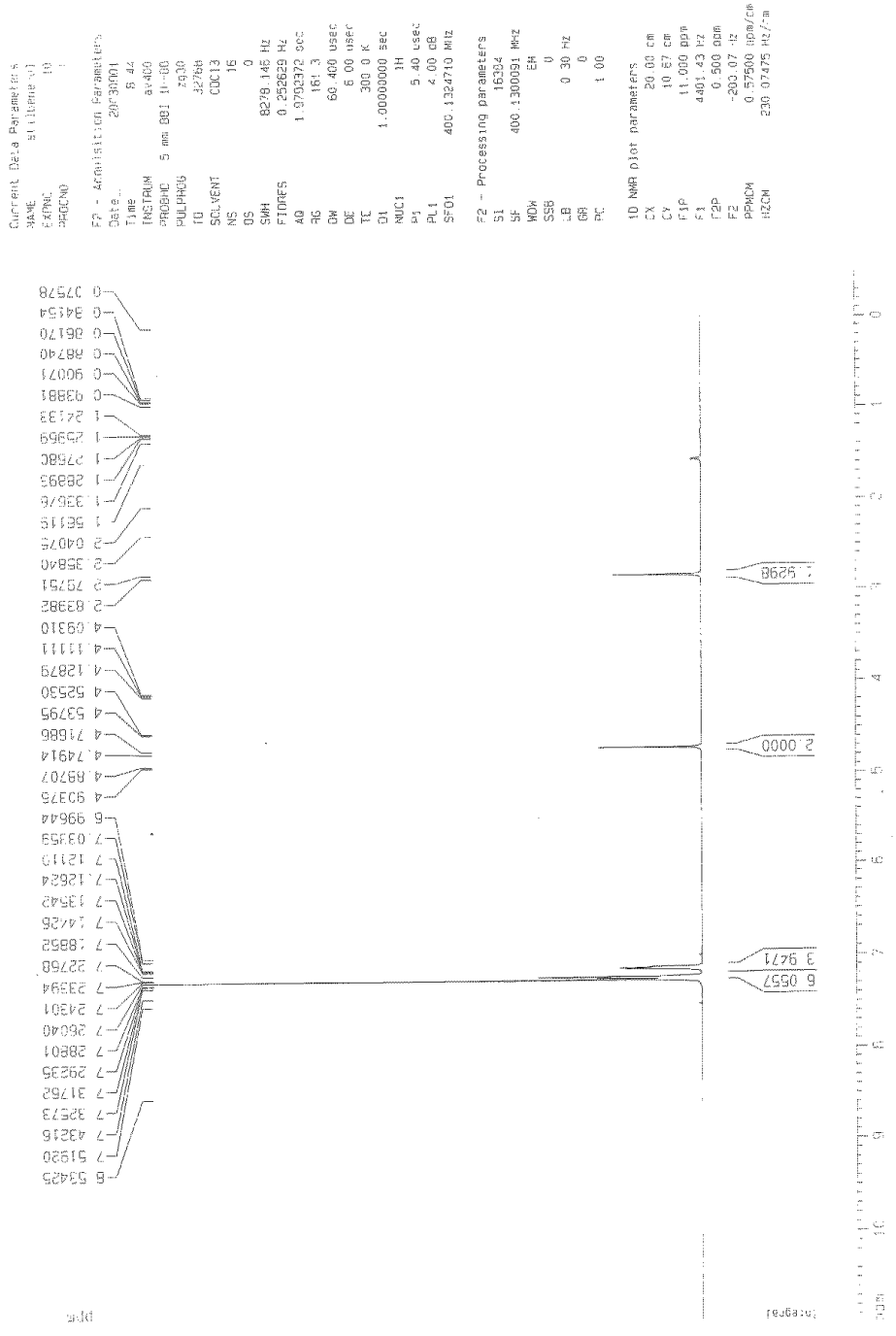
(1) The AA reaction product of styrene: Daicel Chiralcel AD. hexane/^{i}PrOH =90/10，flow rate=0.7 mL/min, t_R(min)=18.1(major), 25.3(minor);

(2) The AA reaction product of 1-chloro-4-vinylbenzene: Dalcel Chiralcel AD. hexane/^{i}PrOH =85/15．flow rate=0.7 mL/min, t_R(min)= 16.6(major), 26.3(minor);

(3) The AA reaction product of 2-vinylnaphthalene: Daicel Chiralcel AD, hexane/^{i}PrOH =70/30，flow rate=0.7 mL/min，t_R(min)= 10.5(major), 16.1(minor);

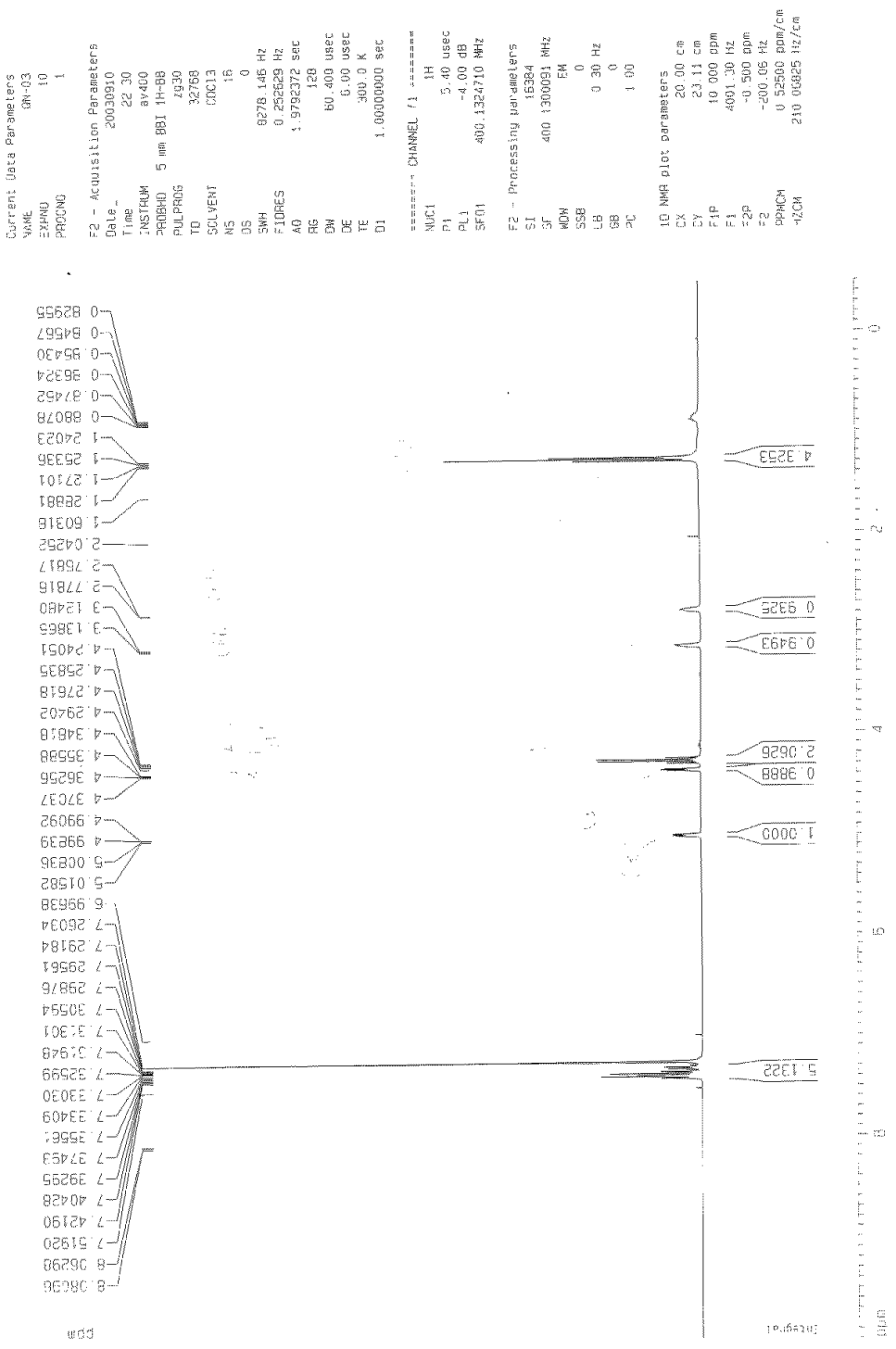
(4) The AA reaction product of ethyl cinnamate: Dalcel Chiralcel OD-H, hexane/^{i}PrOH =85/15，flow rate=0.6 mL/min，t_R(min)= 15.9 (major);

(5) The AA reaction product of propyl cinnamate: Daicel Chiralcel OD-H, hexane/^{i}PrOH =82/18．flow rate=0.4 mL/min，t_R(min)= 20.5 (minor), 22.8(major).



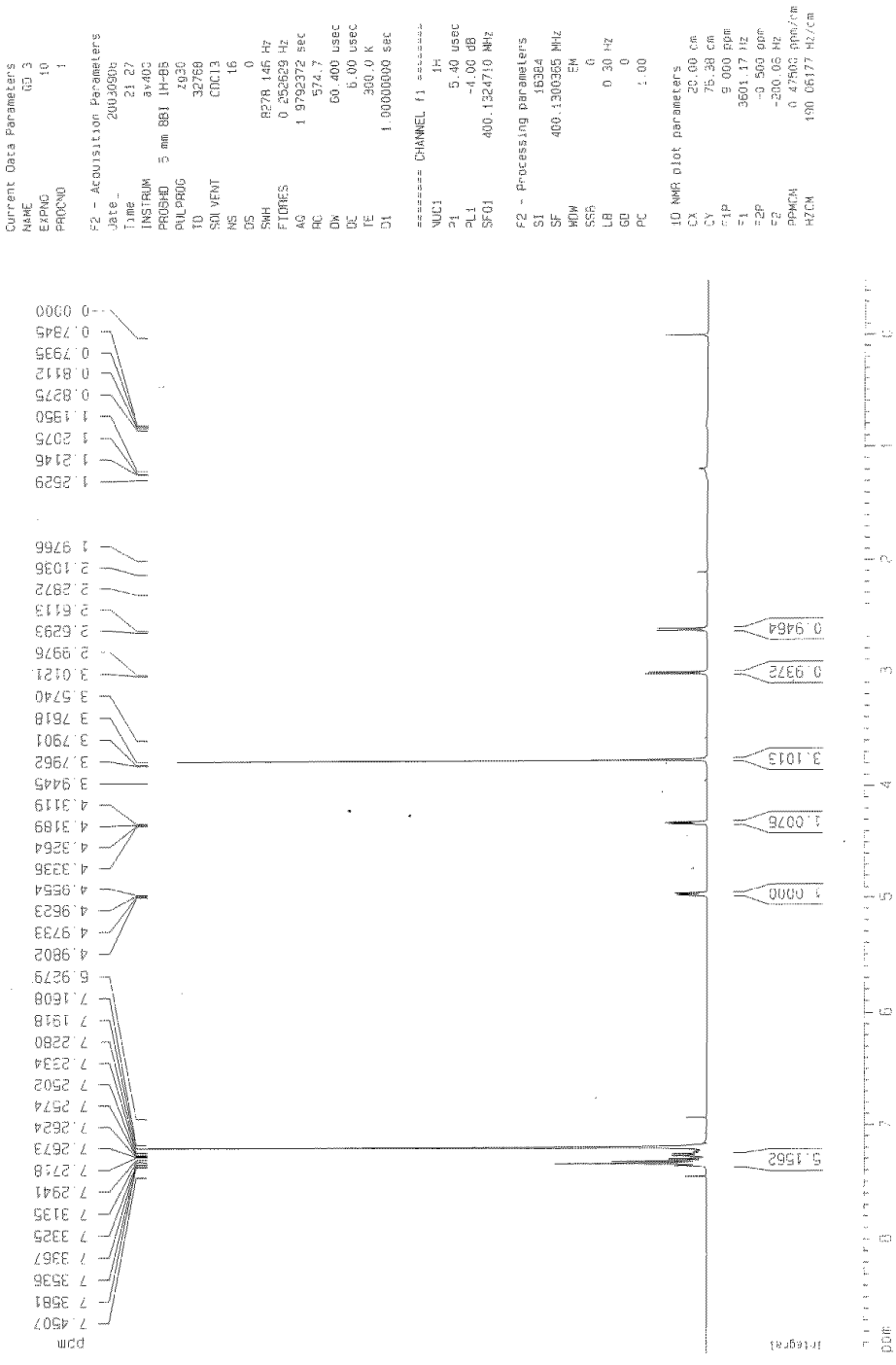
(1) 1,2-Diphenyl-1,2-ethanediol ^{1}H NMR

(Table1, entry 1)



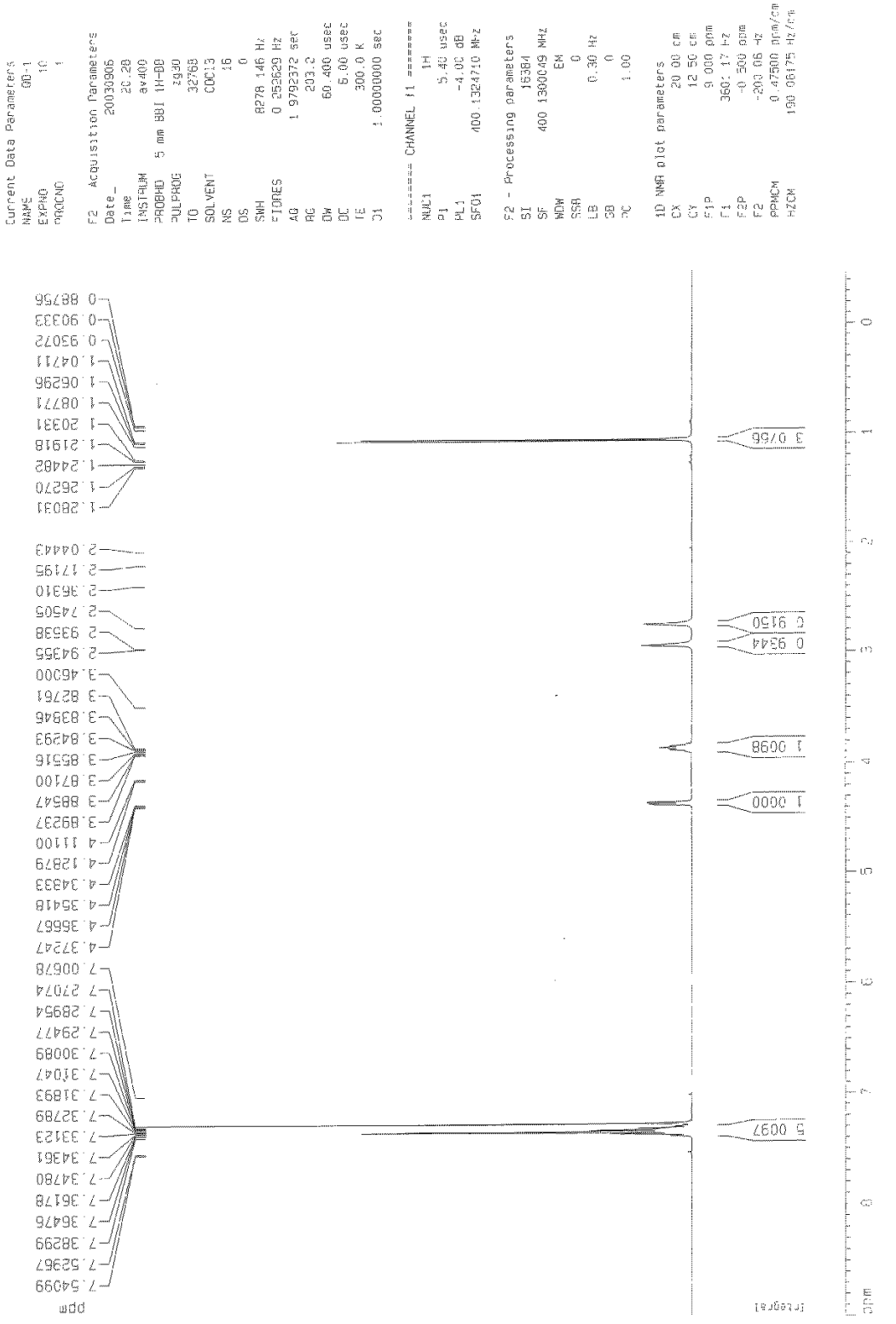
(2) Ethyl-2,3-Dihydroxy-3-phenylpropionate. ^{1}H NMR

(Table1, entry 2)



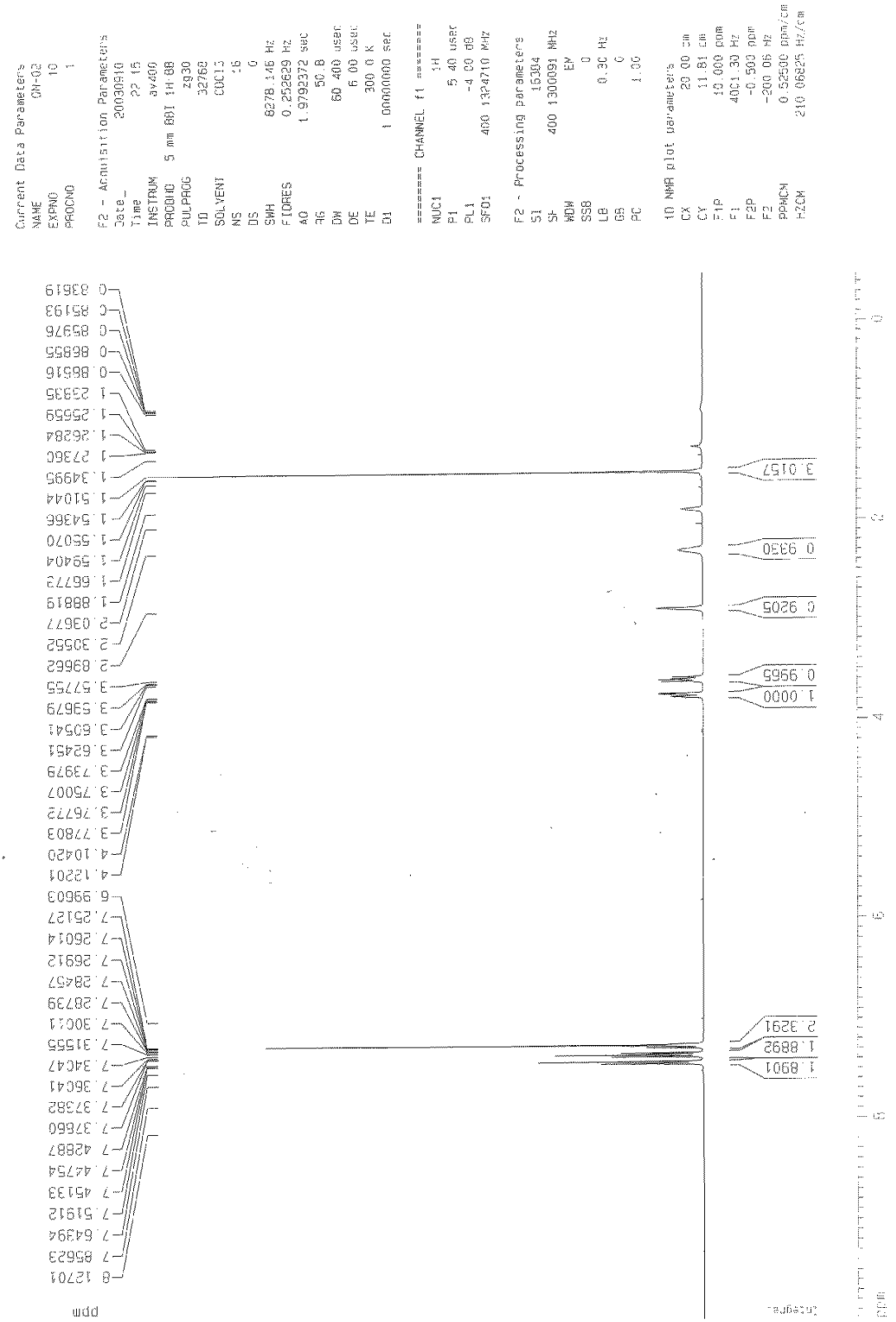
(3) Methyl-2,3-Dihydroxy-3-phenylpropionate ^{1}H NMR

(Table1, entry 3)



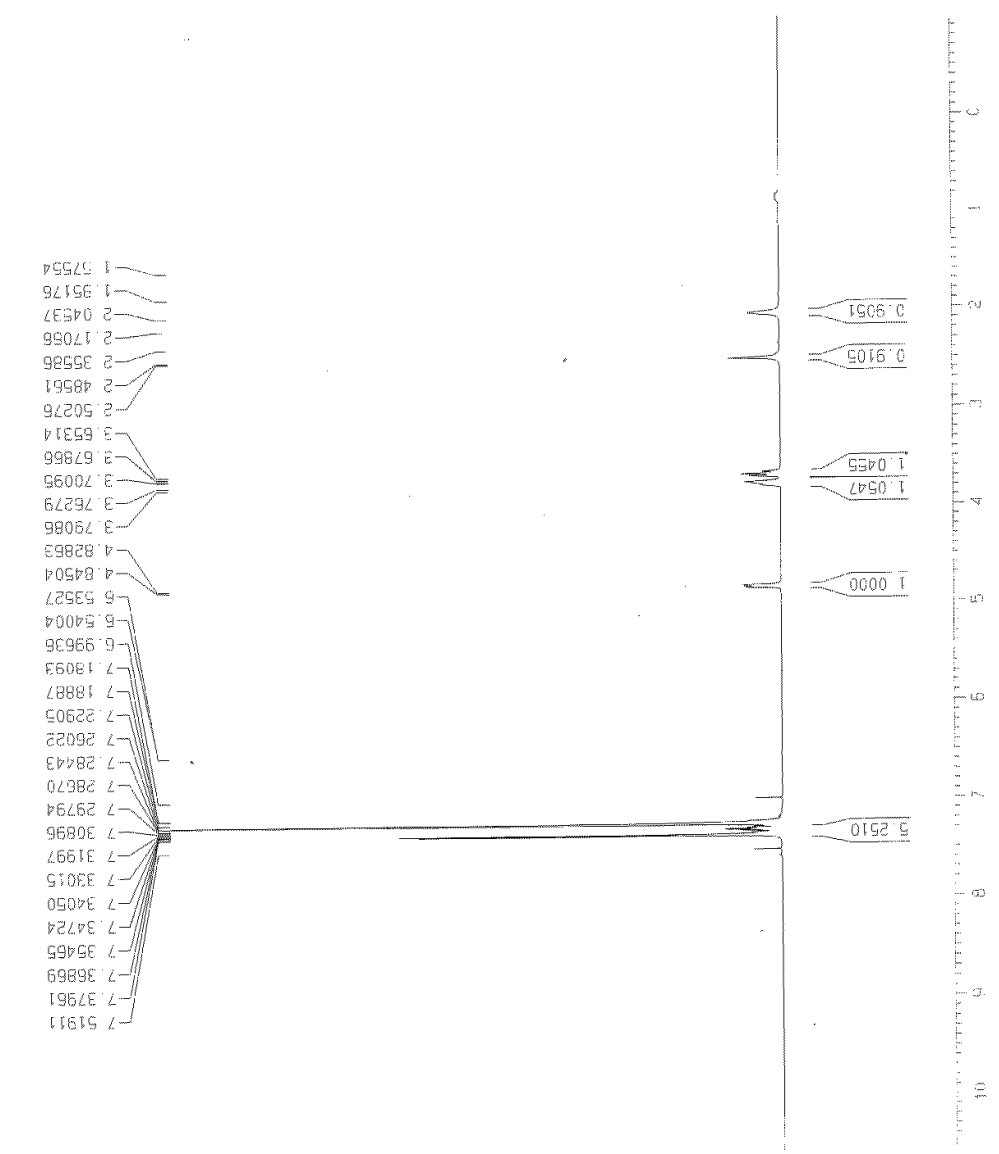
(4) 1-phenyl-1,2-propanediol ^{1}H NMR

(Table1, entry4)



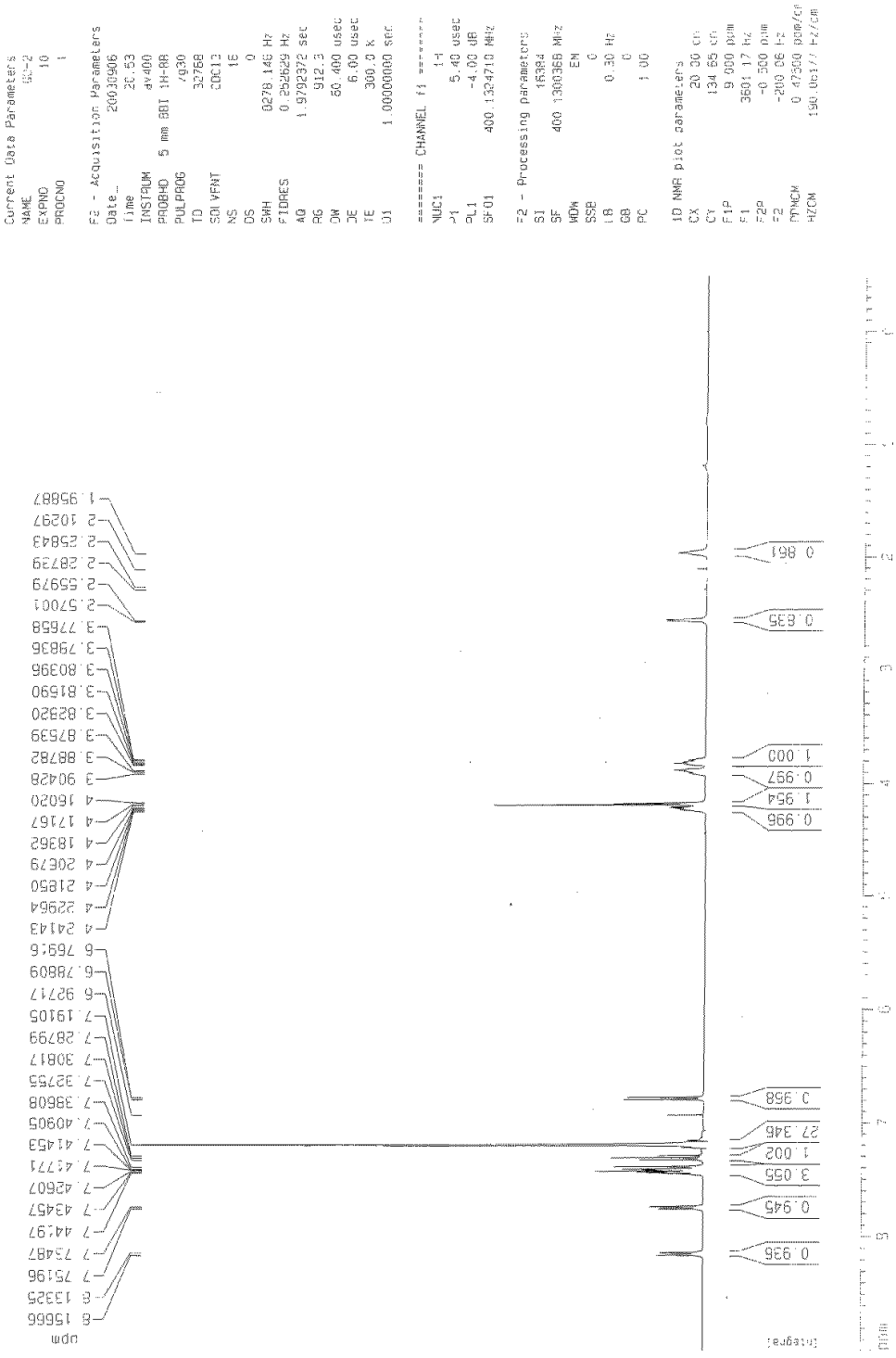
(5) 2-phenyl-1,2-propanediol ^{1}H NMR

(Table1, entry 5)



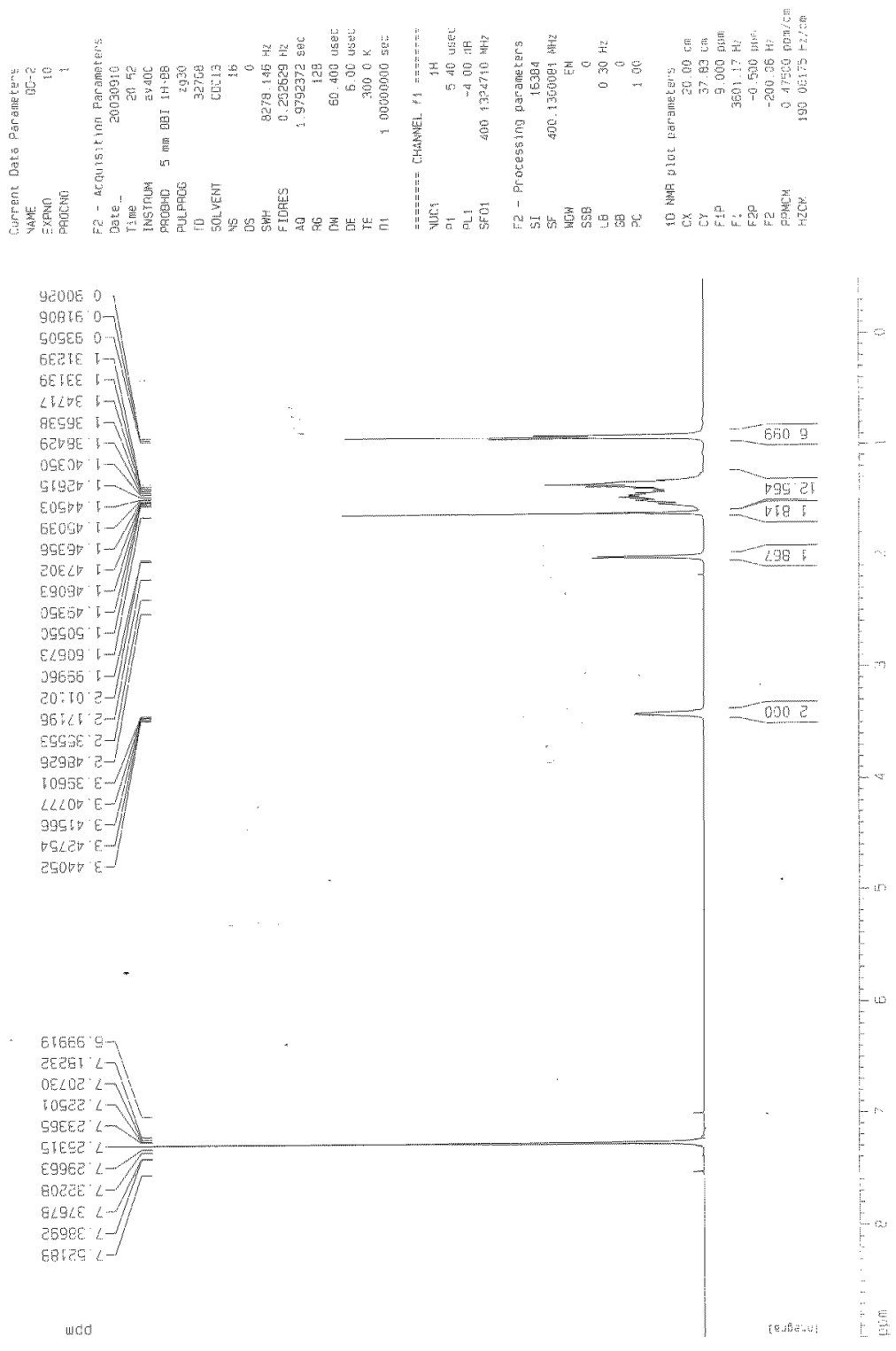
(6) 1-phenyl-1,2-ethanediol ^{1}H NMR

(Table1, entry6)



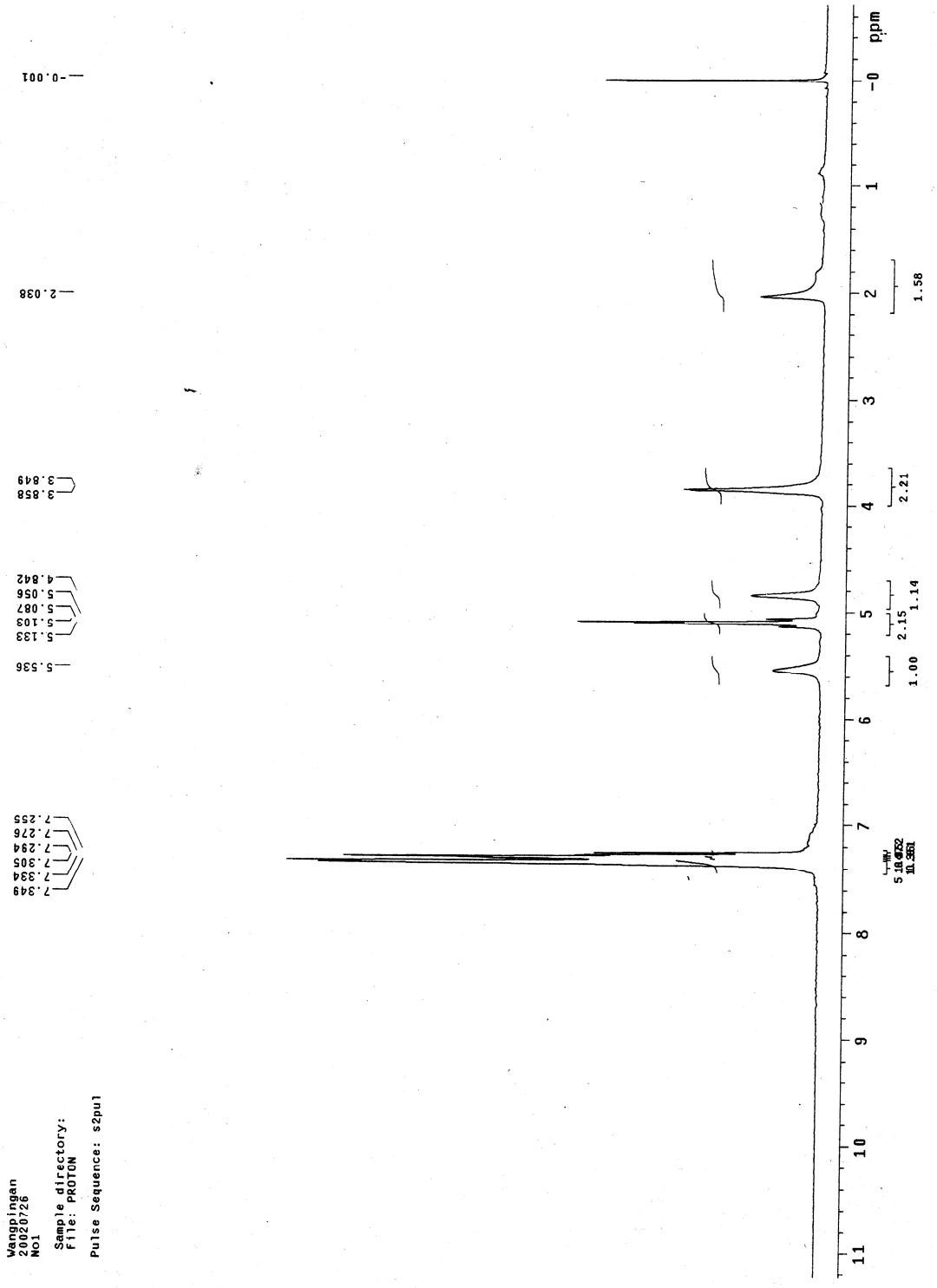
(7) 3-(*α*-naphthoxy)-1,2-propanediol ^{1}H NMR

(Table1, entry 7)

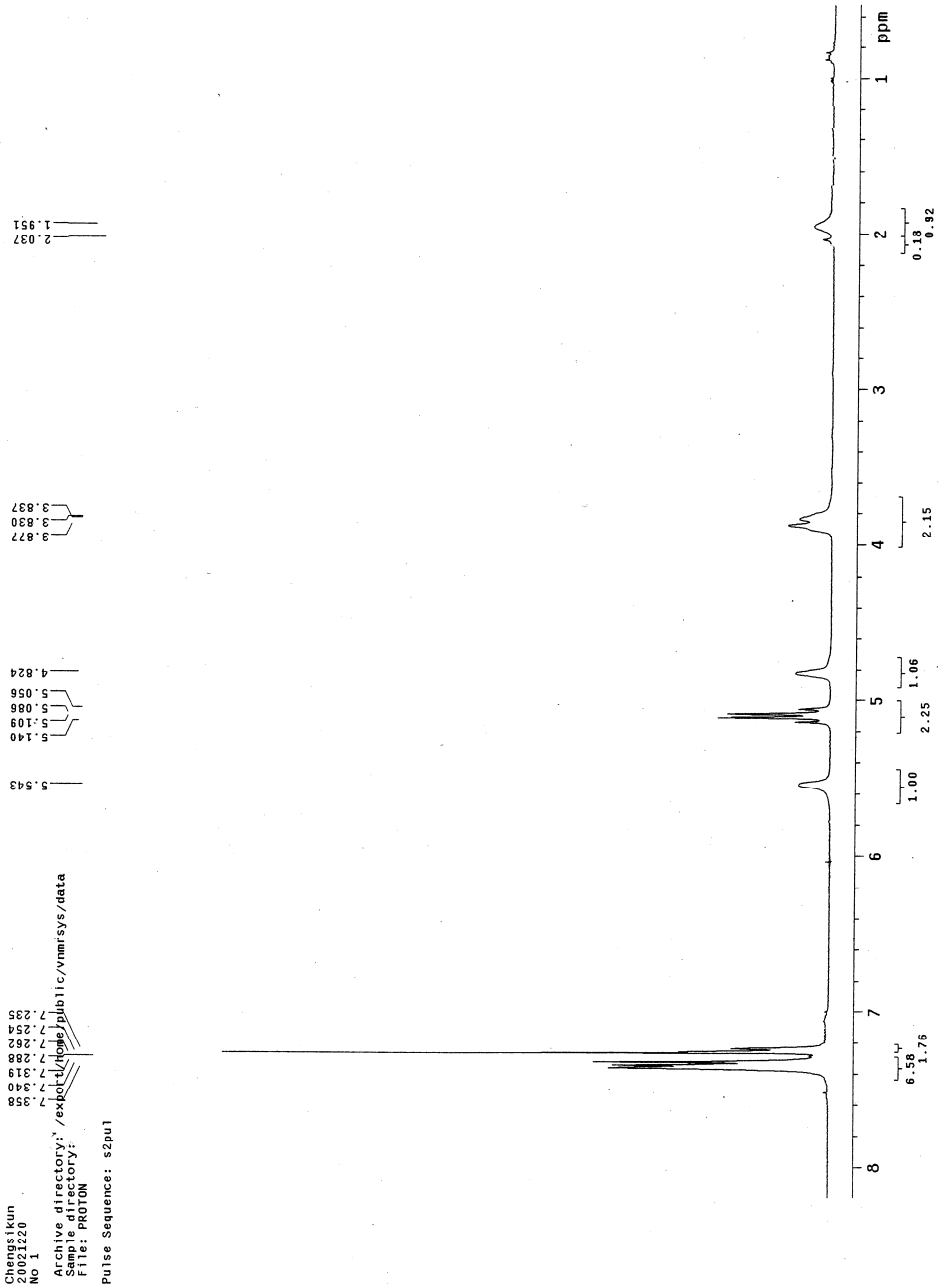


(8) decane-5,6-diol ^{1}H NMR

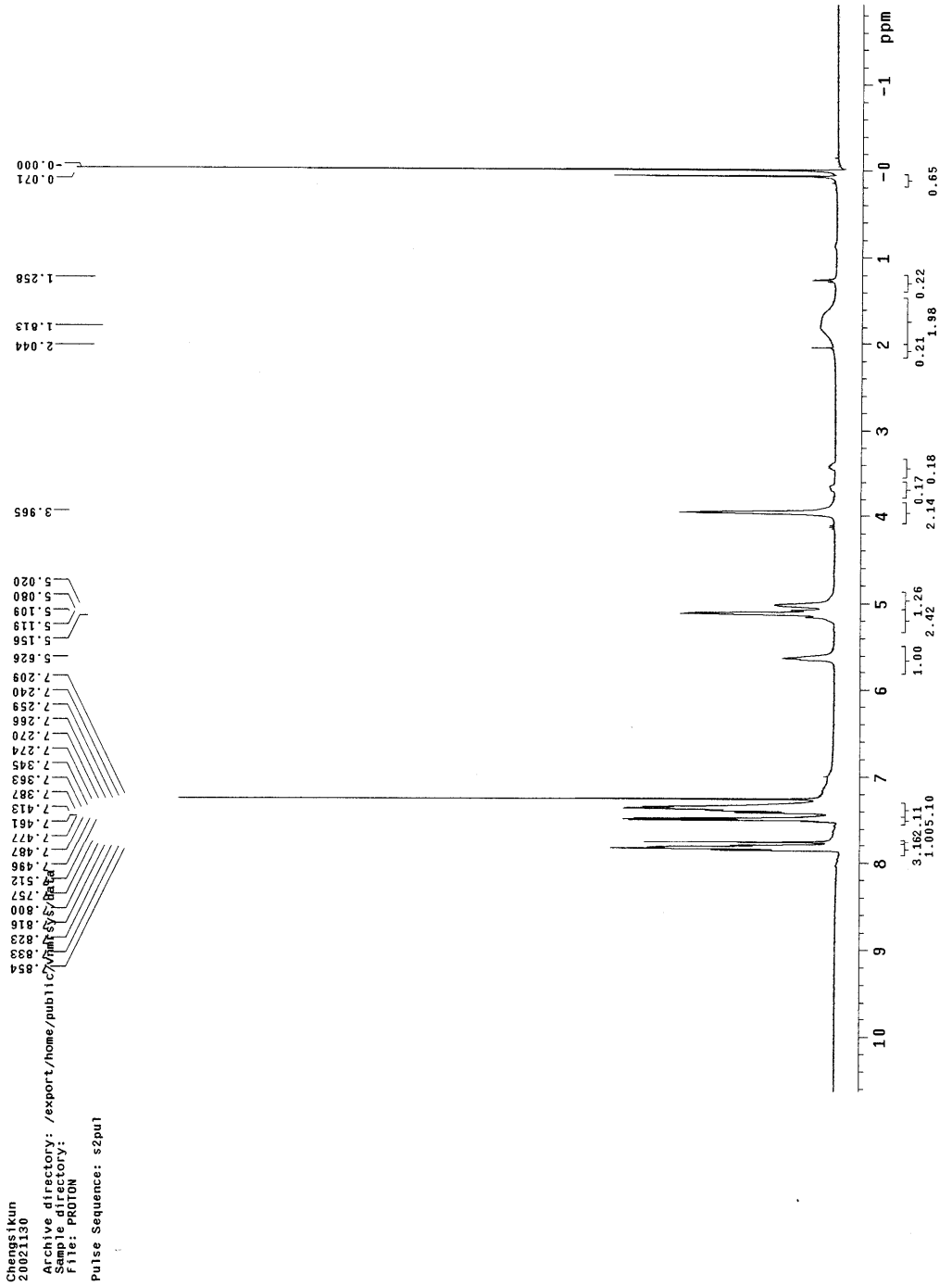
(Table1, entry 8)



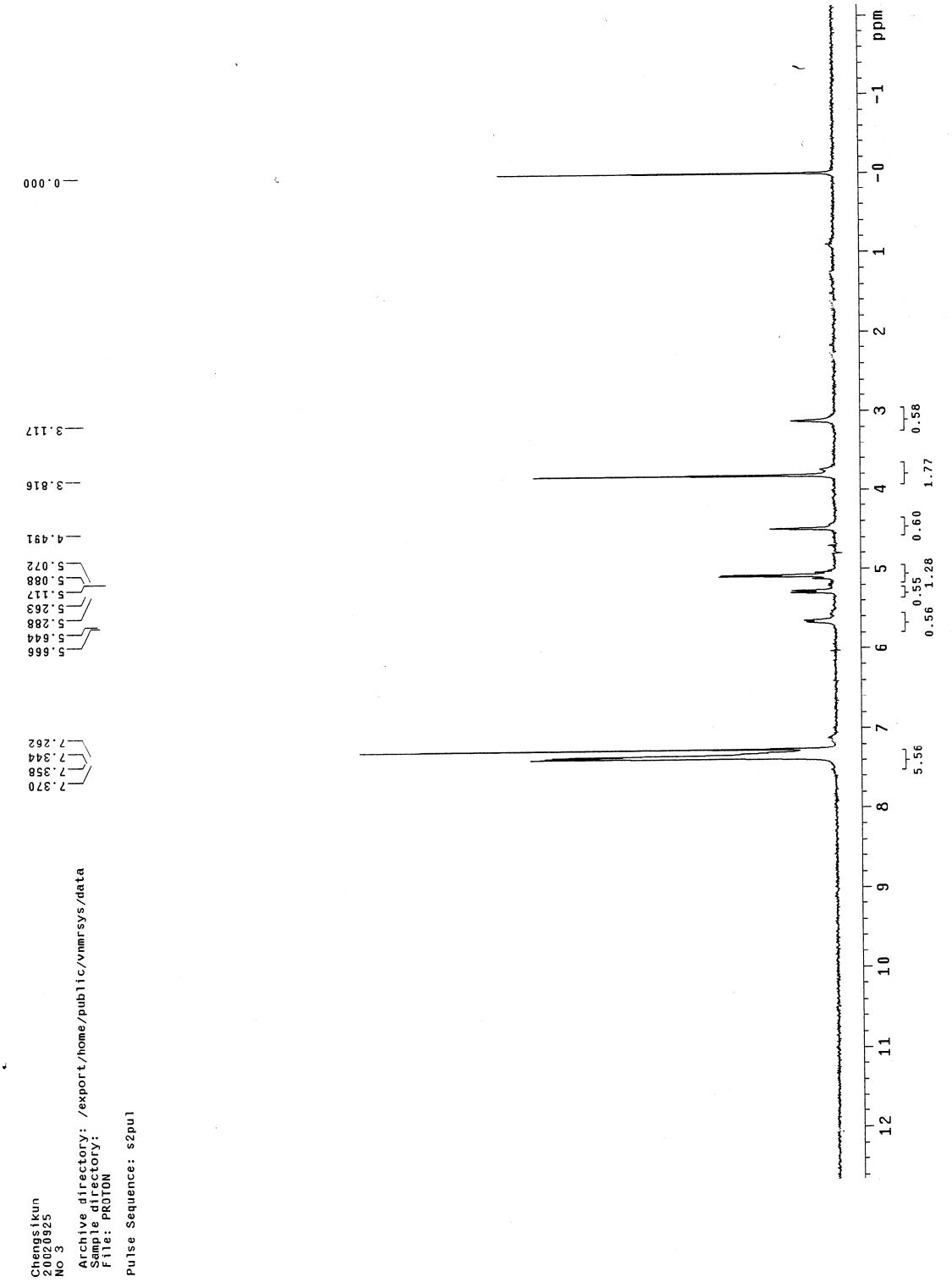
(9) The AA reaction product of styrene ^{1}H NMR
(Table2, entry 1)



(10) The AA reaction product of 1-chloro-4-vinylbenzene ^{1}H NMR (Table2, entry 2)



(11) The AA reaction product of 2-vinylnaphthalene ^{1}H NMR (Table2, entry 3)



(12) The AA reaction product of ethyl cinnamate ^{1}H NMR (Table2, entry 4)

Data File D:\HPCHEM\1\DATA\JR\NEWFOL~1\JR000037.D Sample Name: NA-11

OJ colum hex:iPrOH=90:10flow: 0.5ml/min

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Acq. Operator   : jiangru
Acq. Instrument : Instrument 1
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                  (modified after loading)
Analysis Method : D:\HPCHEM\1\METHODS\JR.M
Last changed    : 9/15/2009 4:03:03 PM by ly
                  (modified after loading)
method for analysis
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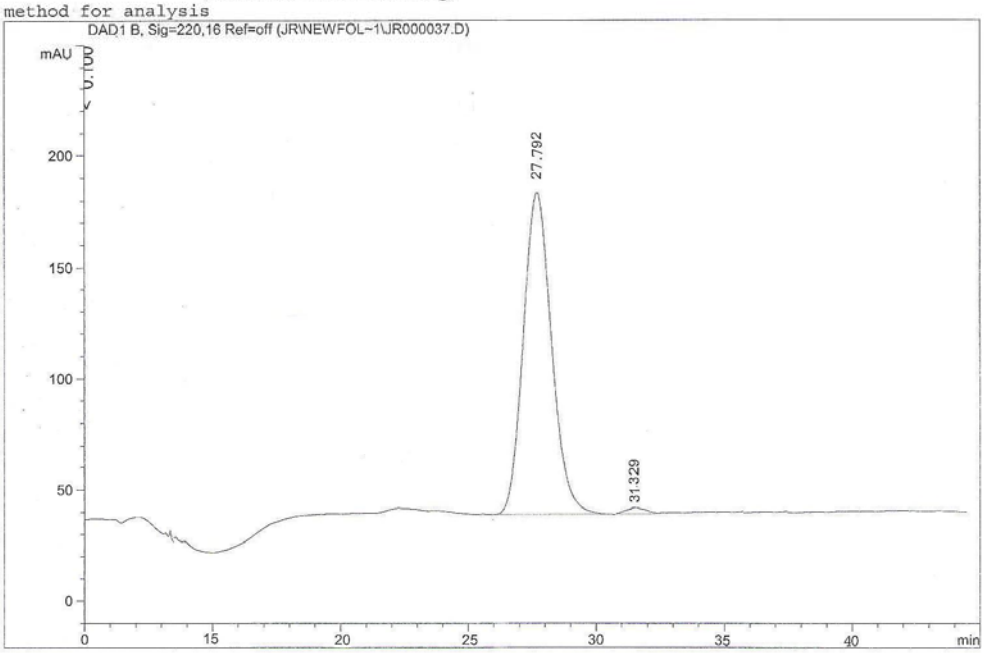


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Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: DAD1 B, Sig=220,16 Ref=off

Peak RetTime Type  Width     Area      Height      Area
  #   [min]        [min]    [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  27.792 BB    1.1756 1.11281e4   144.31137  98.5754
   2  31.329 BP    0.7011  160.81828    2.91759   1.4246

Totals :                  1.12889e4   147.22896

 Results obtained with enhanced integrator!
==================================================================
                      Summed Peaks Report
==================================================================

Signal 1: DAD1 B, Sig=220,16 Ref=off
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HPLC (1,2-Diphenyl-1,2-ethanediol)

Data File D:\HPCHEM\1\DATA\JR\NEWFOL~1\JR000024.D Sample Name: ETHYLESTER-CH

OJ colum hex:iPrOH=90:10 flow: 1.0ml/min

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Acq. Instrument : Instrument 1
Acq. Method     : C:\HPCHEM\1\JR-AD.M
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method for analysis
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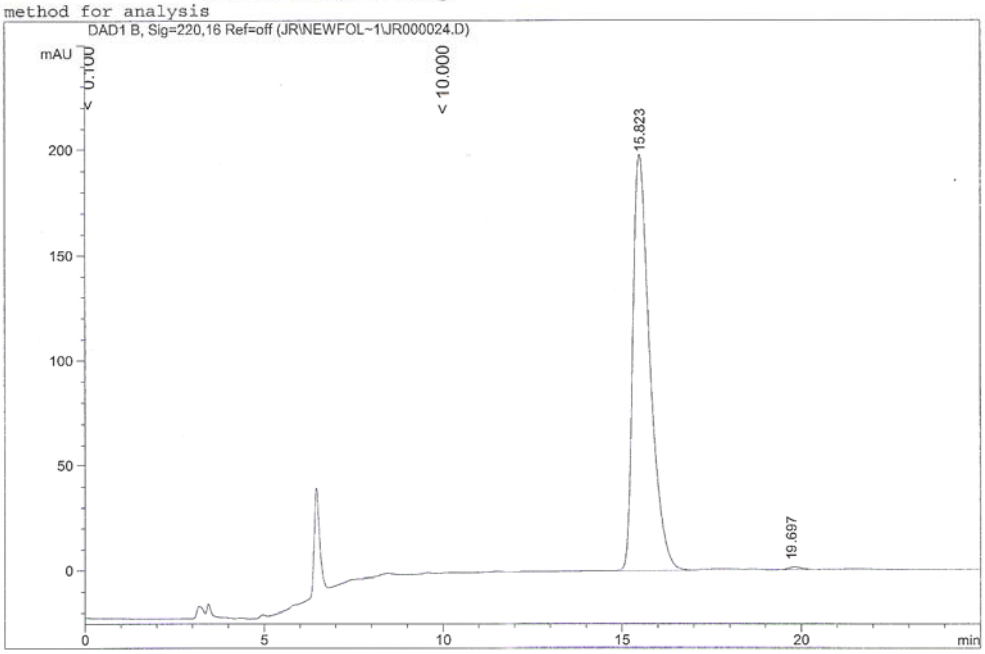


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Dilution              :      1.0000

Signal 1: DAD1 B, Sig=220,16 Ref=off

Peak RetTime Type  Width     Area      Height     Area
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   1  15.823 BB    0.5070 6591.54541  197.66968  99.4995
   2  19.697 BB    0.3560   33.15410    1.29786   0.5005

Totals :                  6624.69951  198.96754

 Results obtained with enhanced integrator!
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                      Summed Peaks Report
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Signal 1: DAD1 B, Sig=220,16 Ref=off
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HPLC (Ethyl-2,3-Dihydroxy-3-phenylpropionate)

Data File D:\HPCHEM\1\DATA\JR\NEWFOL~1\JR000007.D Sample Name: phenyl

OB colum hex:iPrOH=90:10 flew: 0.5 ml/min

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Sample Name     : phenyl                          Location : Vial 1
Acq. Operator   : jiangru
Acq. Instrument : Instrument 1
Acq. Method     : C:\HPCHEM\1\JR-AD.M
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Analysis Method : D:\HPCHEM\1\METHODS\JR.M
Last changed    : 9/13/2009 11:41:10 AM by ly
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method for analysis
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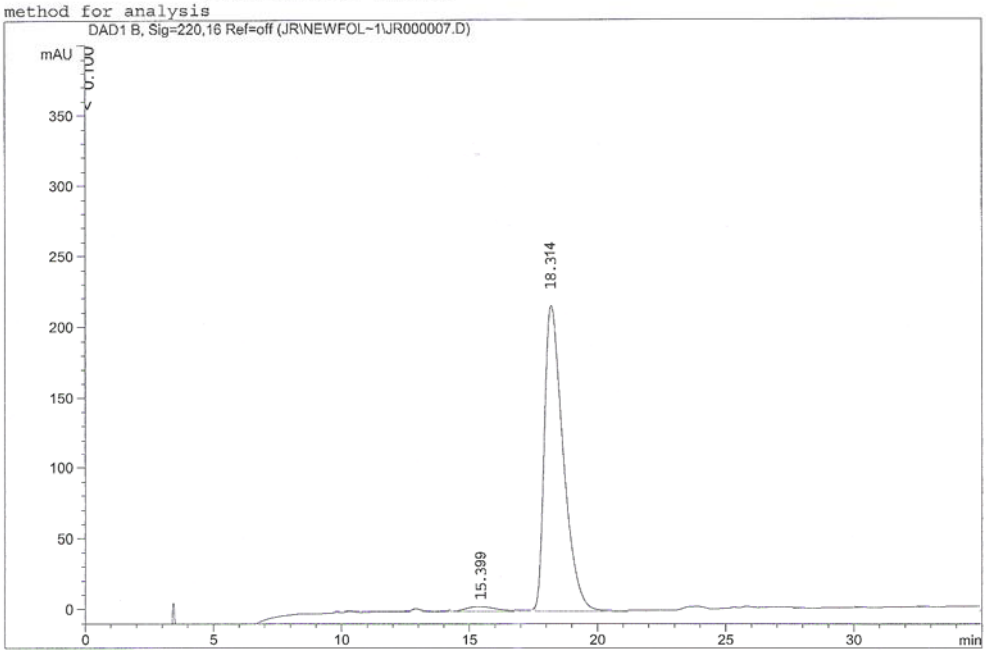


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Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000


Signal 1: DAD1 B, Sig=220,16 Ref=off

Peak RetTime Type  Width     Area      Height     Area
  #   [min]      [min]    [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  15.399 BB    1.2783  250.11389    3.09659   2.2331
   2  18.314 BBA   0.7839 1.09504e4   215.83185  97.7669

Totals :                  1.12005e4   218.92844

 Results obtained with enhanced integrator!
==================================================================
                        Summed Peaks Report
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Signal 1: DAD1 B, Sig=220,16 Ref=off
```


HPLC (1-phenyl-1,2-ethanediol. Daicel)

Data File D:\HPCHEM\1\DATA\JR\NEWFOL~1\JR000036.D Sample Name: NA-37

AD colum hex:iPrOH=90:10flow: 0.7ml/min

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Sample Name     : NA-37                          Location : Vial 1
Acq. Operator   : jiangru
Acq. Instrument : Instrument 1
Acq. Method     : C:\HPCHEM\1\JR-AA.M
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Last changed    : 9/13/2009 11:10:28 AM by ly
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method for analysis
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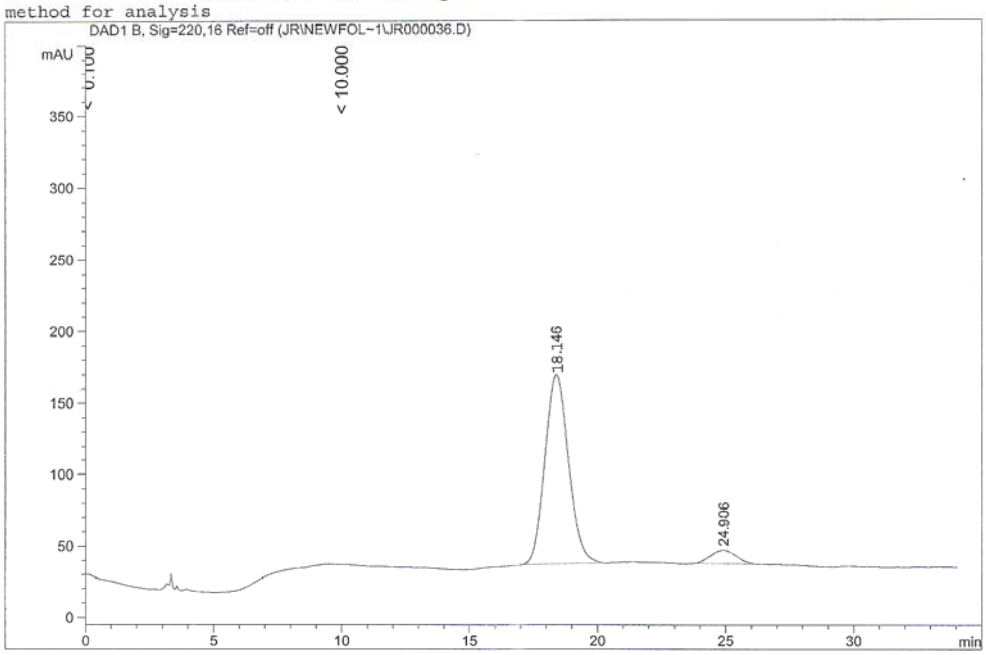


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Dilution              :      1.0000

Signal 1: DAD1 B, Sig=220,16 Ref=off

Peak RetTime Type  Width     Area      Height     Area
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----|-------|----|-------|----------|----------|--------|
   1  18.146 BB    0.9888 8428.08301  132.37822  92.8802
   2  24.906 BB    0.9602  646.06561    9.37227   7.1198

Totals :                  9074.14862  141.75049

 Results obtained with enhanced integrator!
================================================================================
                          Summed Peaks Report
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Signal 1: DAD1 B, Sig=220,16 Ref=off
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HPLC(the AA reaction product of styrene)

Data File D:\HPCHEM\1\DATA\JR\AA\AA000016.D Sample Name: stlibene-Ch07

Hex:iPr-OH=85:15, flow=0.6ml/min, CHIRALCEL OD-H

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Injection Date  : 8/6/2009 5:52:35 PM
Sample Name     : stlibene-Ch07                    Location : Vial 1
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Acq. Instrument : Instrument 1
Acq. Method     : D:\HPCHEM\1\JR\AA.M
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Analysis Method : D:\HPCHEM\1\METHODS\JR.M
Last changed    : 8/14/2009 11:33:01 AM by LY
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method for analysis
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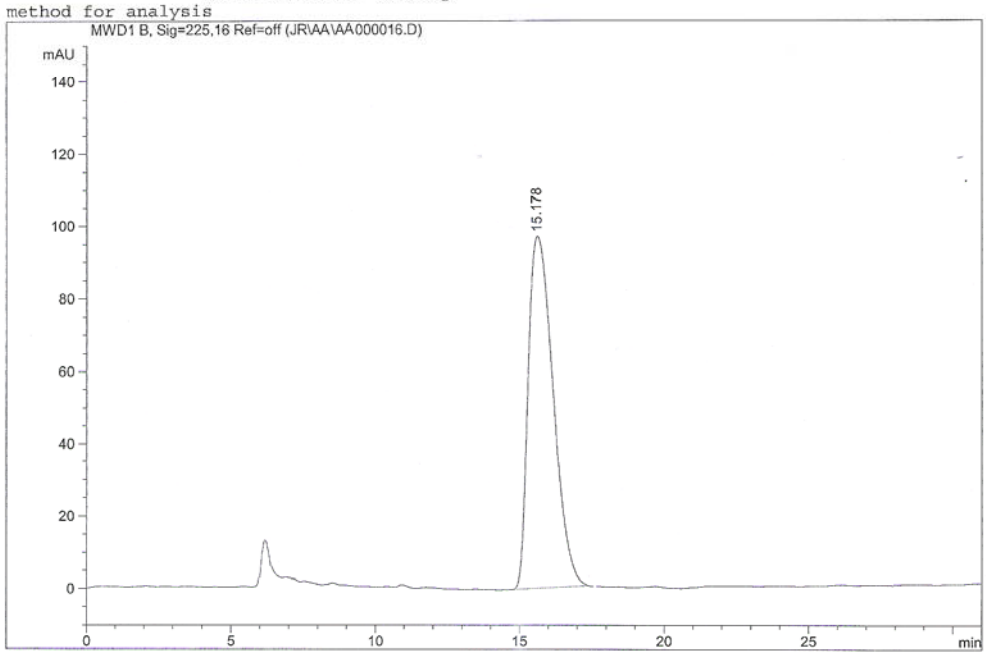


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Dilution              :      1.0000


Signal 1: MWD1 B, Sig=225,16 Ref=off

Peak RetTime Type  Width     Area      Height     Area
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   1  15.178 BB    0.9546 5798.08691   96.82544 100.0000

Totals :                  5798.08691   96.82544

 Results obtained with enhanced integrator!
==========================================================================
                        Summed Peaks Report
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Signal 1: MWD1 B, Sig=225,16 Ref=off
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HPLC(the AA reaction product of ethyl cinnamate)