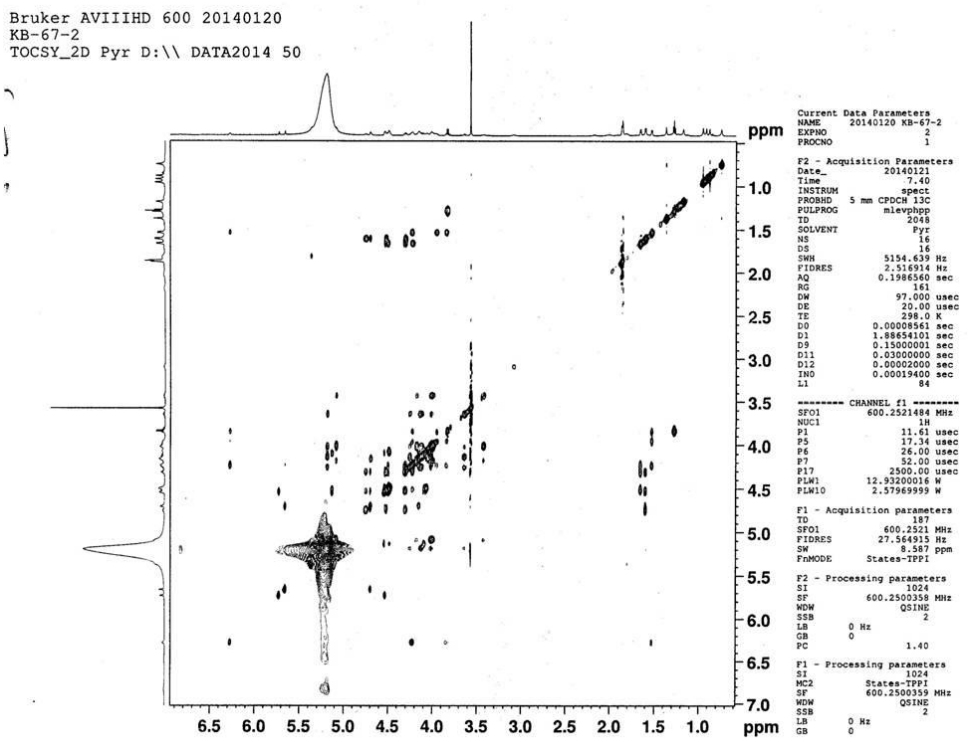
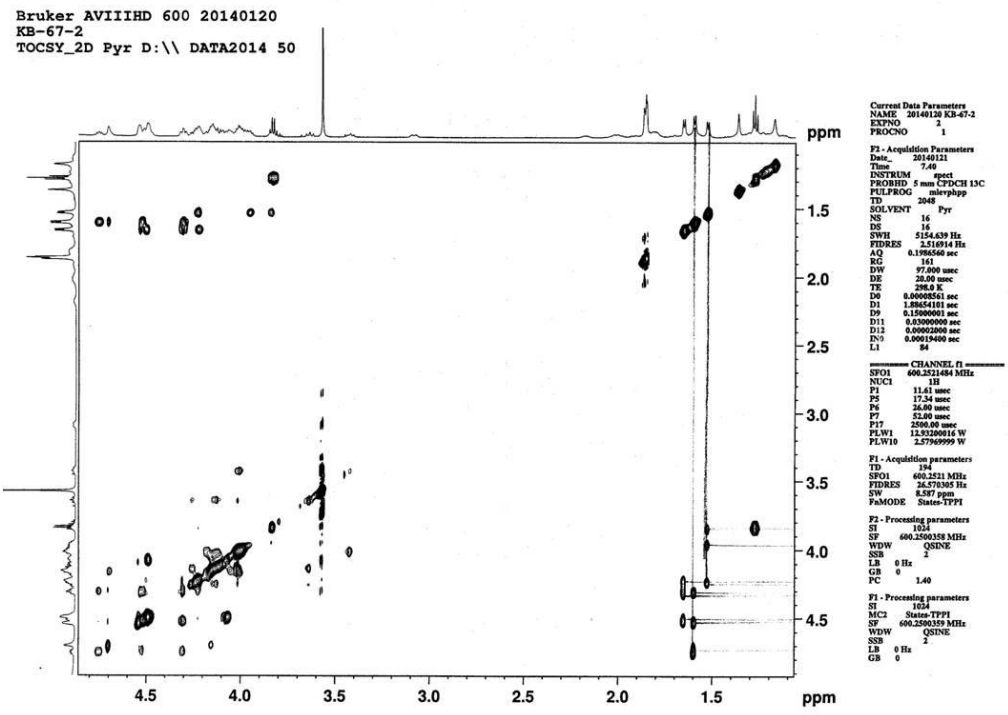
Supplementary Materials

Figure S1. The TOCSY Spectrum of Compound **C1**.

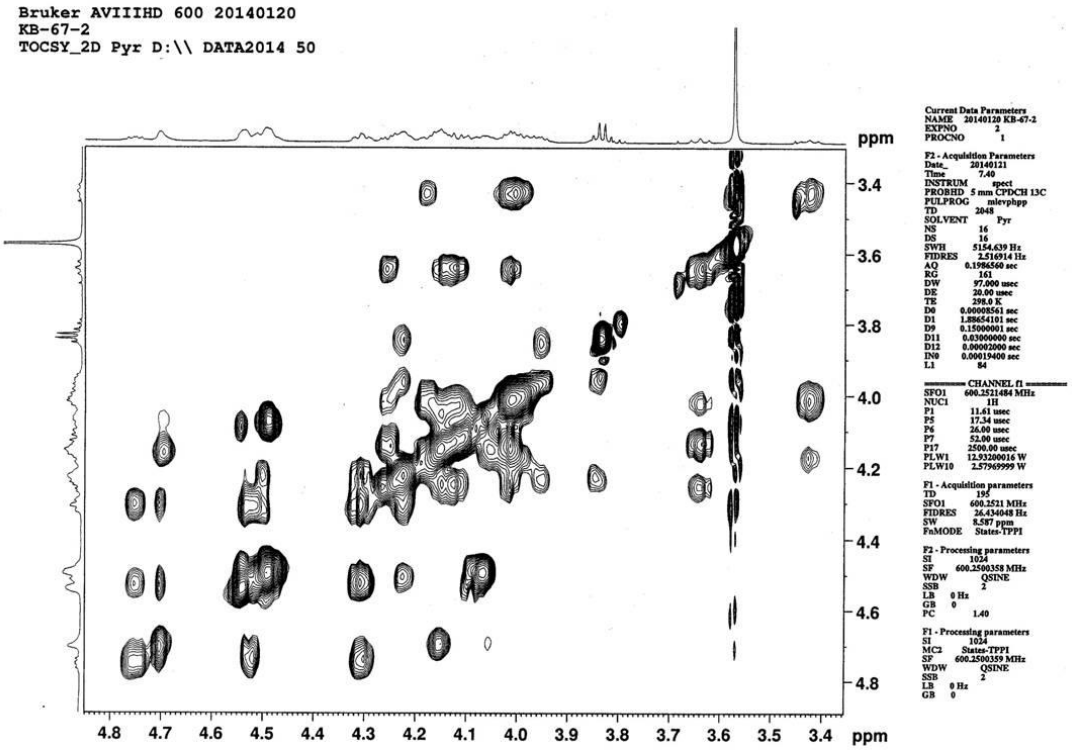


The whole TOCSY Spectrum of Compound C1.

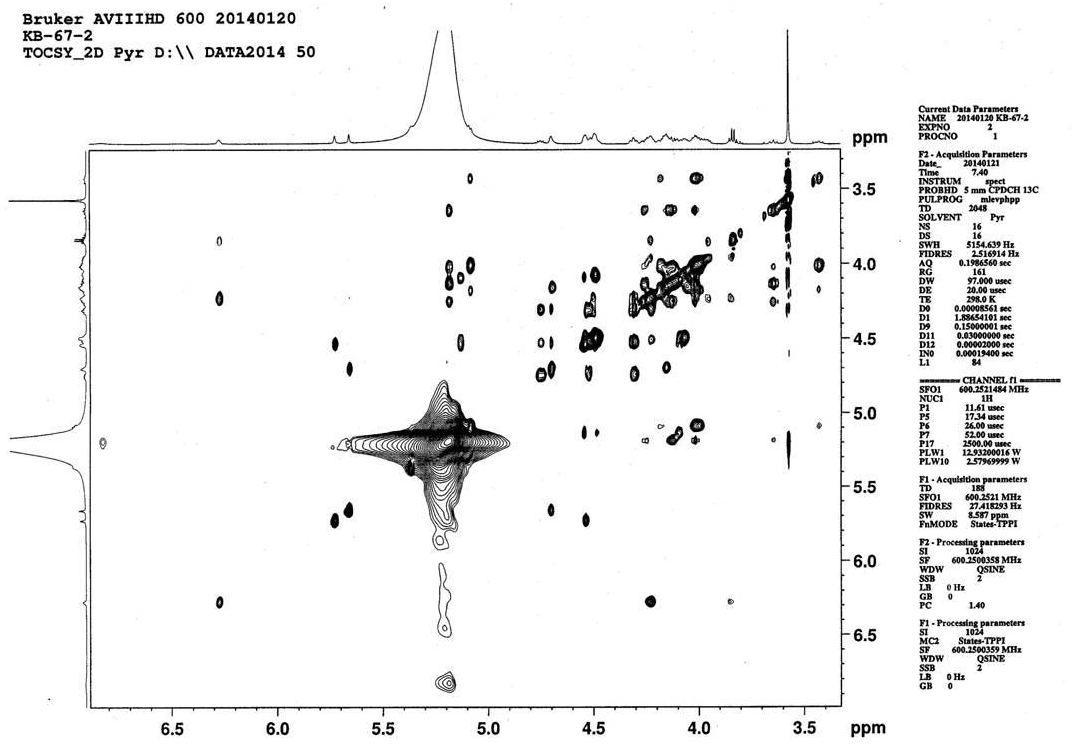


The part 1 of the TOCSY Spectrum of Compound C1.

Figure S1. *Cont.*

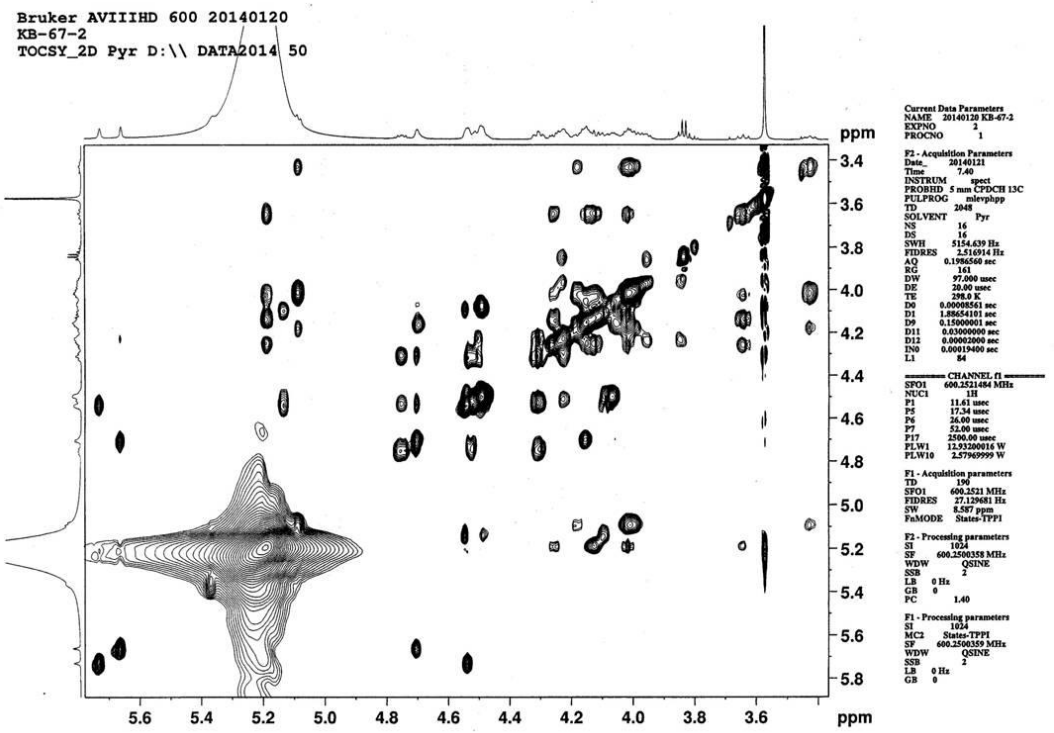


The part 2 of the TOCSY Spectrum of Compound C1.

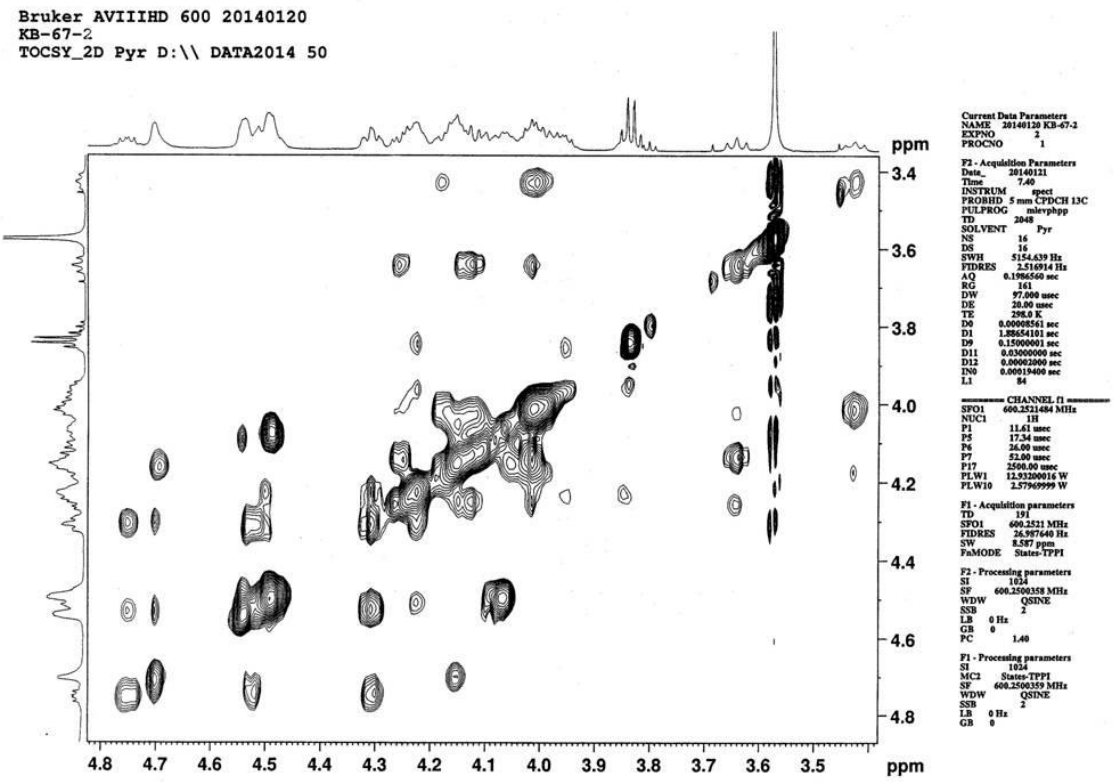


The part 3 of the TOCSY Spectrum of Compound C1.

Figure S1. *Cont.*

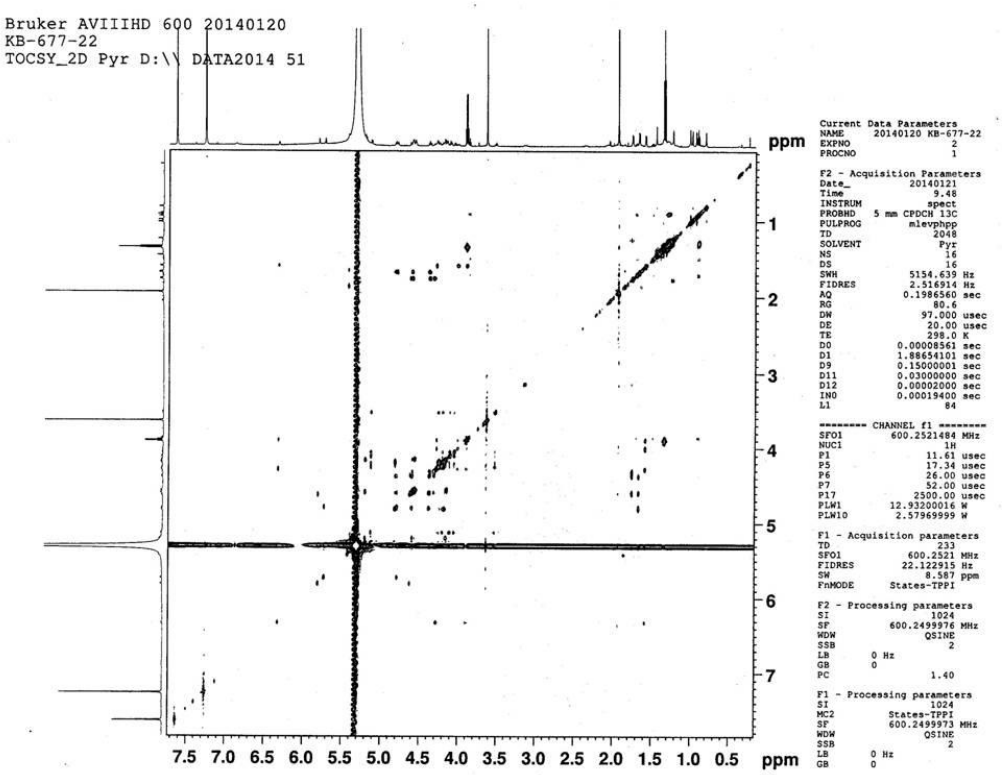


The part 4 of the TOCSY Spectrum of Compound C1.

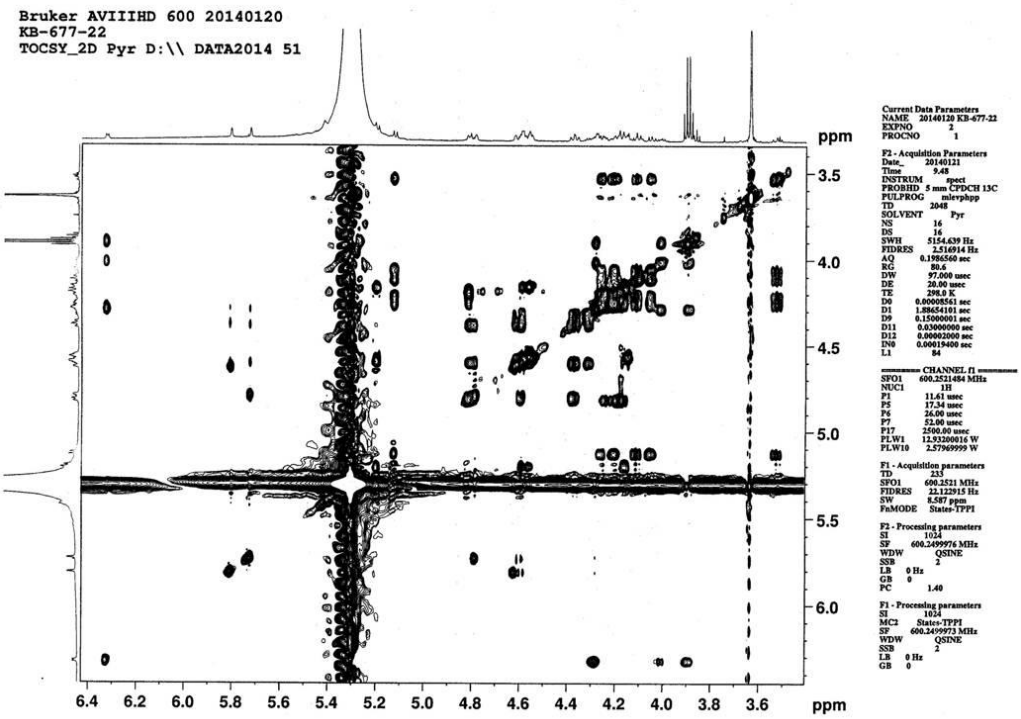


The part 5 of the TOCSY Spectrum of Compound C1.

Figure S2. The TOCSY Spectrum of Compound **C2.**

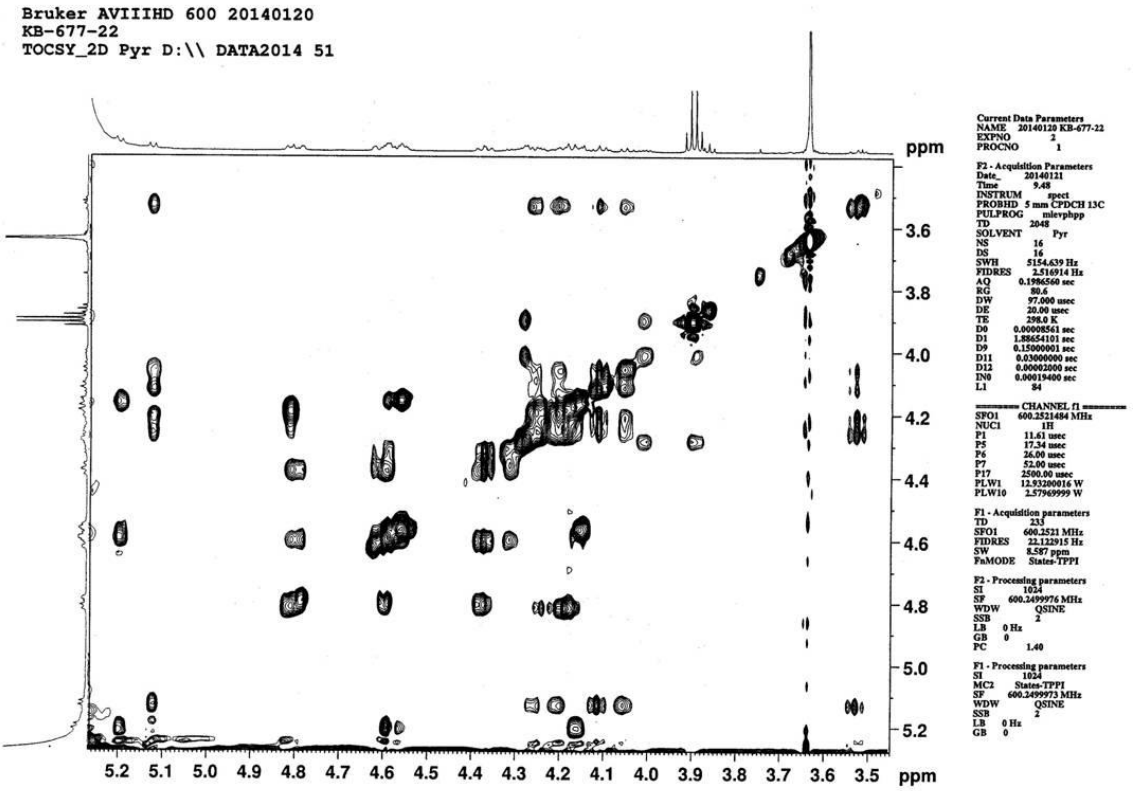


The whole TOCSY Spectrum of Compound C2.

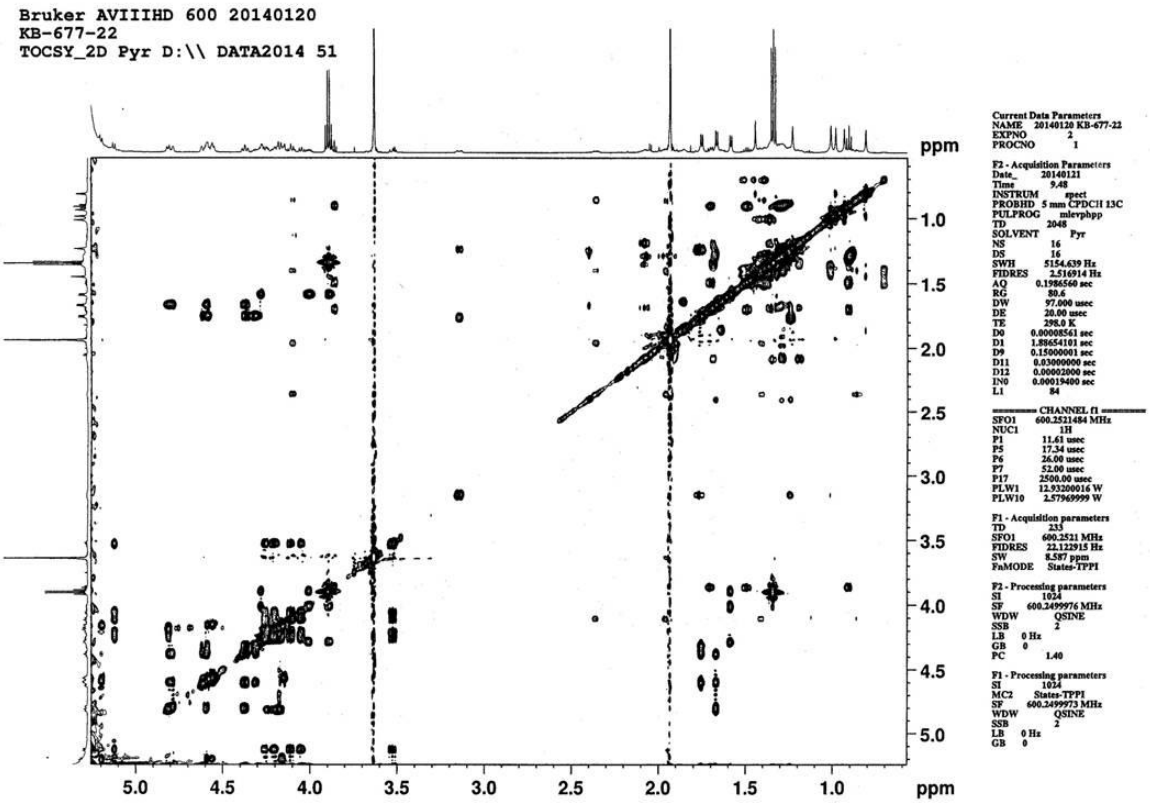


The part 1 of the TOCSY Spectrum of Compound C2.

Figure S2. *Cont.*

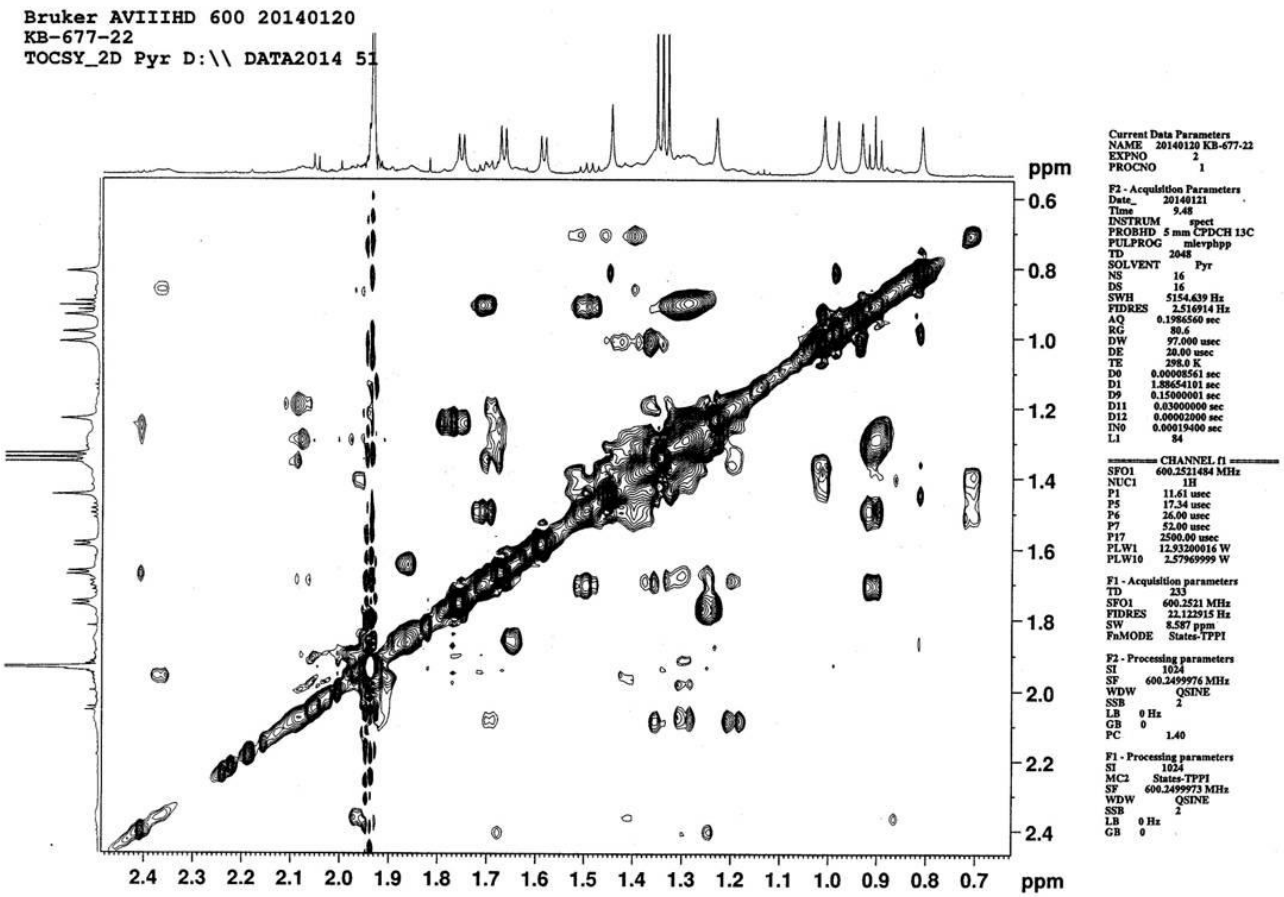


The part 2 of the TOCSY Spectrum of Compound C2.



The part 3 of the TOCSY Spectrum of Compound C2.

Figure S2. *Cont.*



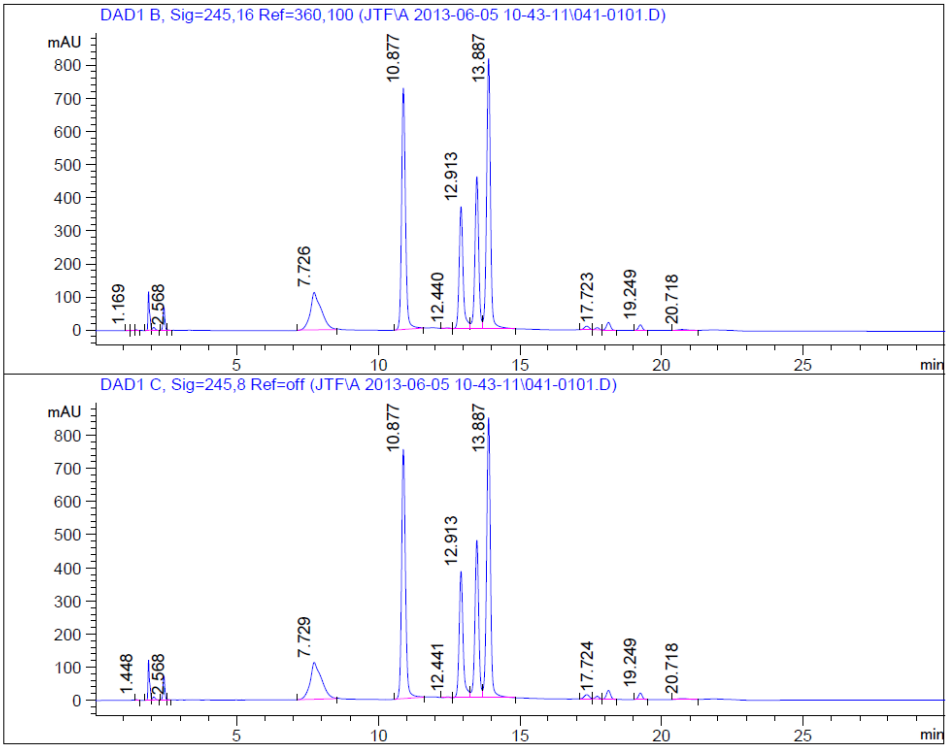
The part 4 of the TOCSY Spectrum of Compound C2.

Figure S3. The HPLC Chromatography of the derivatives of sugars in Compound **C1**.

Data file : D:\DATA\JTF\A 2013-06-05 10-43-11\041-0101.D
Sample Name: 2-1 1

Injection Date	: Wed, 5. Jun. 2013	Seq Line	: 1
Sample Name	: 2-1	Location	: Vial 41
Acq Operator	: SLL	Inj. No.	: 1
		Inj. Vol.	: 20 µl

Acq. Method : D:\DATA\JTF\A 2013-06-05 10-43-11\JTF.M
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last Changed : Wed, 26. Jun. 2013, 10:02:45 am
(modified after loading)



Customized Report: Area Pecent Report

Multiplier : 1.000000
Dilution : 1.000000
Uncalibrated Peaks : not reported

Signal 1: DAD1 B, Sig=245,16 Ref=360,100

Peak #	RT [min]	Type	Width [min]	Height [mAU]	Area %	Area [mAU*s]
1	1.169	BV	0.087	1.003	0.021	5.732
2	1.323	VV	0.123	1.387	0.037	10.096
3	1.446	VB	0.060	3.271	0.050	13.484
4	1.878	BV	0.058	118.094	1.716	466.661
5	2.060	VB	0.102	9.423	0.231	62.857

Figure S3. *Cont.*

Data file : D:\DATA\JTF\A 2013-06-05 10-43-11\041-0101.D
Sample Name: 2-1 2

Peak #	RT [min]	Type	Width [min]	Height [mAU]	Area %	Area [mAU*s]
6	2.418	BV	0.071	69.837	1.169	317.954
7	2.568	VV	0.068	1.576	0.027	7.345
8	7.726	BB	0.355	113.697	11.299	3073.369
9	10.877	BB	0.145	729.668	25.593	6961.459
10	12.440	BV	0.181	2.074	0.082	22.252
11	12.913	VV	0.148	368.248	13.189	3587.517
12	13.473	VV	0.142	458.987	15.631	4251.577
13	13.887	VB	0.145	816.262	28.463	7742.103
14	17.354	BV	0.202	11.466	0.549	149.386
15	17.723	VV	0.152	7.526	0.270	73.446
16	18.122	VB	0.157	23.426	0.865	235.264
17	19.249	BB	0.145	16.865	0.582	158.271
18	20.718	BB	0.339	2.641	0.226	61.422

Signal 2: DAD1 C, Sig=245,8 Ref=off

Peak #	RT [min]	Type	Width [min]	Height [mAU]	Area %	Area [mAU*s]
1	1.448	VB	0.063	2.545	0.038	10.583
2	1.878	BV	0.058	122.080	1.715	482.782
3	2.060	VB	0.102	9.639	0.229	64.497
4	2.418	BV	0.071	72.319	1.171	329.658
5	2.568	VV	0.069	1.667	0.028	7.841
6	7.729	BB	0.364	111.709	11.031	3104.410
7	10.877	BB	0.145	753.384	25.550	7190.292
8	12.441	BV	0.181	2.149	0.082	22.952
9	12.913	VV	0.148	381.733	13.215	3719.042
10	13.473	VV	0.142	476.033	15.669	4409.695
11	13.887	VB	0.145	846.198	28.518	8025.639
12	17.354	BV	0.202	13.212	0.613	172.390
13	17.724	VV	0.152	8.679	0.302	85.074
14	18.122	VB	0.157	26.960	0.964	271.164
15	19.249	BB	0.145	19.364	0.646	181.728
16	20.718	BB	0.342	2.770	0.229	64.583

Figure S4. The HPLC Chromatography of the derivatives of sugars in Compound **C2**.

```
Data file   : D:\DATA\JTF\A 2013-06-05 10-43-11\042-0201.D
Sample Name: 2-2                                                          1
================================================================================
Injection Date  : Wed, 5. Jun. 2013          Seq Line   :            2
Sample Name     : 2-2                        Location   :     Vial 42
Acq Operator    : SLL                        Inj. No.   :            1
                                             Inj. Vol.  :       20 µl

Acq. Method     : D:\DATA\JTF\A 2013-06-05 10-43-11\JTF.M
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last Changed    : Wed, 26. Jun. 2013, 10:02:45 am
                  (modified after loading)
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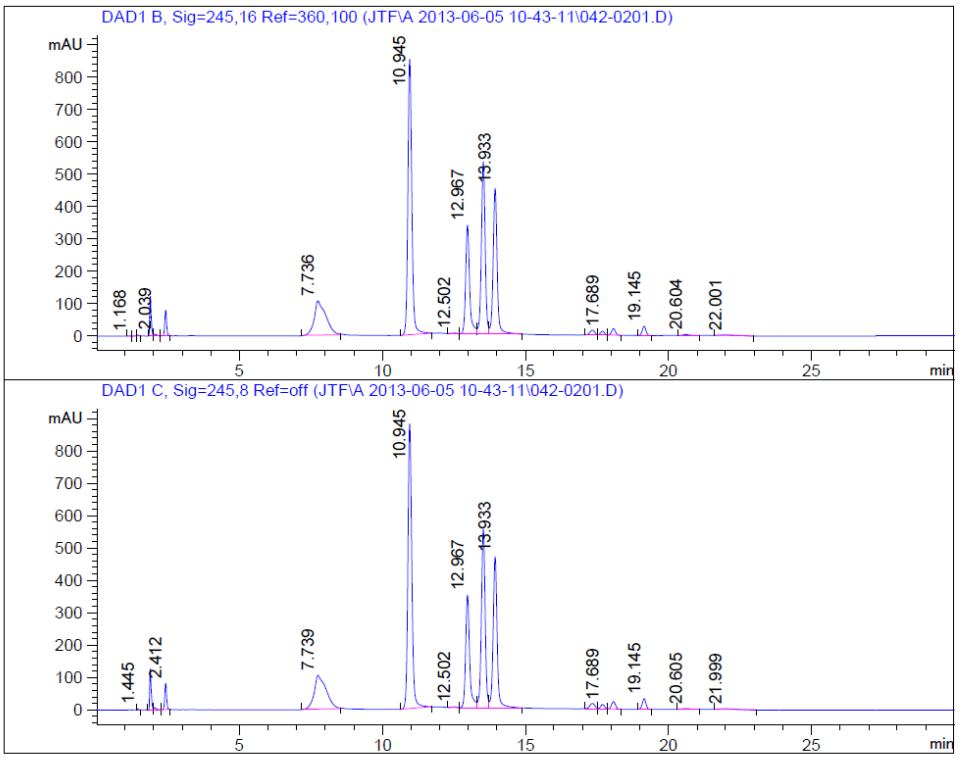


```
================================================================================
                    Customized Report: Area Pecent Report
================================================================================

Multiplier            :  1.000000
Dilution              :  1.000000
Uncalibrated Peaks    :  not reported

Signal  1: DAD1 B, Sig=245,16 Ref=360,100

 |Peak |   RT     |  Type  | Width  |  Height  | Area % |    Area    |
 |  #  |  [min]   |        | [min]  |  [mAU]   |   %    |  [mAU*s]   |
 |-----|----------|--------|--------|----------|--------|------------|
 |    1|     1.168|BV      |   0.091|     1.007|   0.023|       5.915|
 |    2|     1.324|VV      |   0.121|     1.359|   0.038|       9.656|
 |    3|     1.445|VB      |   0.052|     3.670|   0.049|      12.523|
 |    4|     1.876|BV      |   0.054|   123.814|   1.748|     447.414|
 |    5|     2.039|VV      |   0.100|     5.760|   0.151|      38.756|

Instrument 1      Fri, 14. Feb. 2014    11:10:55 am          Page   1 of 2
```

Figure S4. *Cont.*

Data file : D:\DATA\JTF\A 2013-06-05 10-43-11\042-0201.D
Sample Name: 2-2 2

Peak #	RT [min]	Type	Width [min]	Height [mAU]	Area %	Area [mAU*s]
6	2.412	VB	0.072	79.832	1.441	368.717
7	7.736	BB	0.372	107.071	11.911	3048.418
8	10.945	BB	0.145	853.646	31.735	8121.967
9	12.502	BV	0.178	2.347	0.096	24.529
10	12.967	VV	0.147	336.161	12.759	3265.373
11	13.520	VV	0.142	533.083	19.285	4935.545
12	13.933	VB	0.148	450.831	17.165	4393.049
13	17.334	BV	0.198	14.933	0.742	189.782
14	17.689	VV	0.149	12.426	0.470	120.365
15	18.073	VB	0.152	20.601	0.785	200.893
16	19.145	BB	0.139	28.793	1.010	258.557
17	20.604	BB	0.288	2.431	0.178	45.489
18	22.001	BB	0.585	2.428	0.415	106.263

Signal 2: DAD1 C, Sig=245,8 Ref=off

Peak #	RT [min]	Type	Width [min]	Height [mAU]	Area %	Area [mAU*s]
1	1.445	VB	0.053	2.854	0.038	10.023
2	1.876	BV	0.054	127.741	1.740	460.700
3	2.039	VB	0.099	5.739	0.142	37.649
4	2.412	BB	0.071	82.432	1.427	377.799
5	7.739	BB	0.381	105.302	11.634	3080.844
6	10.945	BB	0.145	881.365	31.675	8388.284
7	12.502	BV	0.178	2.442	0.096	25.537
8	12.967	VV	0.147	348.442	12.782	3384.880
9	13.520	VV	0.142	552.816	19.327	5118.388
10	13.933	VB	0.148	467.379	17.192	4552.745
11	17.334	BV	0.198	17.191	0.826	218.670
12	17.689	VV	0.149	14.314	0.525	138.917
13	18.073	VB	0.152	23.710	0.874	231.424
14	19.145	BB	0.139	33.072	1.122	297.064
15	20.605	BB	0.289	2.556	0.181	48.030
16	21.999	BB	0.581	2.549	0.421	111.551

Figure S5. The HPLC Chromatography of the derivative of L-Rhamnose.

```
Data file  : D:\DATA\JTF\A 2013-06-04 16-25-07\035-0501.D
Sample Name: 2-R                                                          1
================================================================================
Injection Date  : Tue, 4. Jun. 2013          Seq Line   :           5
Sample Name     : 2-R                        Location   :     Vial 35
Acq Operator    : SLL                        Inj. No.   :           1
                                             Inj. Vol.  :       20 µl

Acq. Method     : D:\DATA\JTF\A 2013-06-04 16-25-07\JTF.M
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last Changed    : Wed, 26. Jun. 2013, 10:02:45 am
                  (modified after loading)
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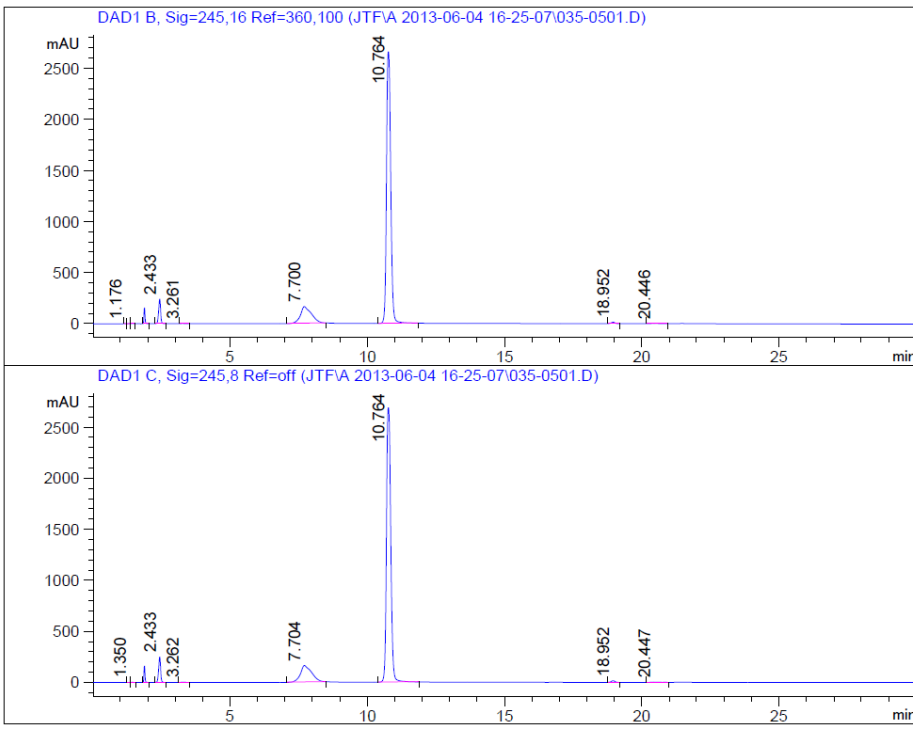


```
================================================================================
                  Customized Report: Area Pecent Report
================================================================================


Multiplier            :  1.000000
Dilution              :  1.000000
Uncalibrated Peaks    :  not reported

Signal  1: DAD1 B, Sig=245,16 Ref=360,100
```

Peak #	RT [min]	Type	Width [min]	Height [mAU]	Area %	Area [mAU*s]
1	1.176	BV	0.070	1.195	0.015	5.326
2	1.350	VV	0.125	1.718	0.036	12.737
3	1.434	VB	0.055	5.449	0.058	20.209
4	1.876	BB	0.044	154.442	1.198	418.829
5	2.433	BB	0.077	241.809	3.498	1222.512

Figure S5. *Cont.*

Data file : D:\DATA\JTF\A 2013-06-04 16-25-07\035-0501.D
Sample Name: 2-R 2

Peak #	RT [min]	Type	Width [min]	Height [mAU]	Area %	Area [mAU*s]
6	3.261	BB	0.131	1.627	0.043	15.170
7	7.700	BB	0.376	165.692	13.422	4691.088
8	10.764	BB	0.166	2662.881	81.242	28394.283
9	18.952	BB	0.141	14.090	0.371	129.772
10	20.446	BB	0.295	2.171	0.116	40.398

Signal 2: DAD1 C, Sig=245,8 Ref=off

Peak #	RT [min]	Type	Width [min]	Height [mAU]	Area %	Area [mAU*s]
1	1.350	VV	0.104	1.204	0.024	8.706
2	1.433	VB	0.056	4.256	0.045	16.143
3	1.876	BB	0.044	160.668	1.218	435.131
4	2.433	BB	0.077	250.172	3.540	1264.697
5	3.262	BB	0.135	1.726	0.047	16.728
6	7.704	BB	0.384	163.681	13.276	4742.915
7	10.764	BB	0.170	2690.479	81.312	29048.945
8	18.952	BB	0.141	16.177	0.417	148.868
9	20.447	BB	0.299	2.291	0.120	42.999

Figure S6. The HPLC Chromatography of the derivative of D-Glucose.

```
Data file   : D:\DATA\JTF\A 2013-06-04 16-25-07\033-0301.D
Sample Name: 2-G                                                              1
================================================================================
Injection Date  : Tue, 4. Jun. 2013            Seq Line   :            3
Sample Name     : 2-G                          Location   :     Vial 33
Acq Operator    : SLL                          Inj. No.   :            1
                                               Inj. Vol.  :       20 µl

Acq. Method     : D:\DATA\JTF\A 2013-06-04 16-25-07\JTF.M
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last Changed    : Wed, 26. Jun. 2013, 10:02:45 am
                  (modified after loading)
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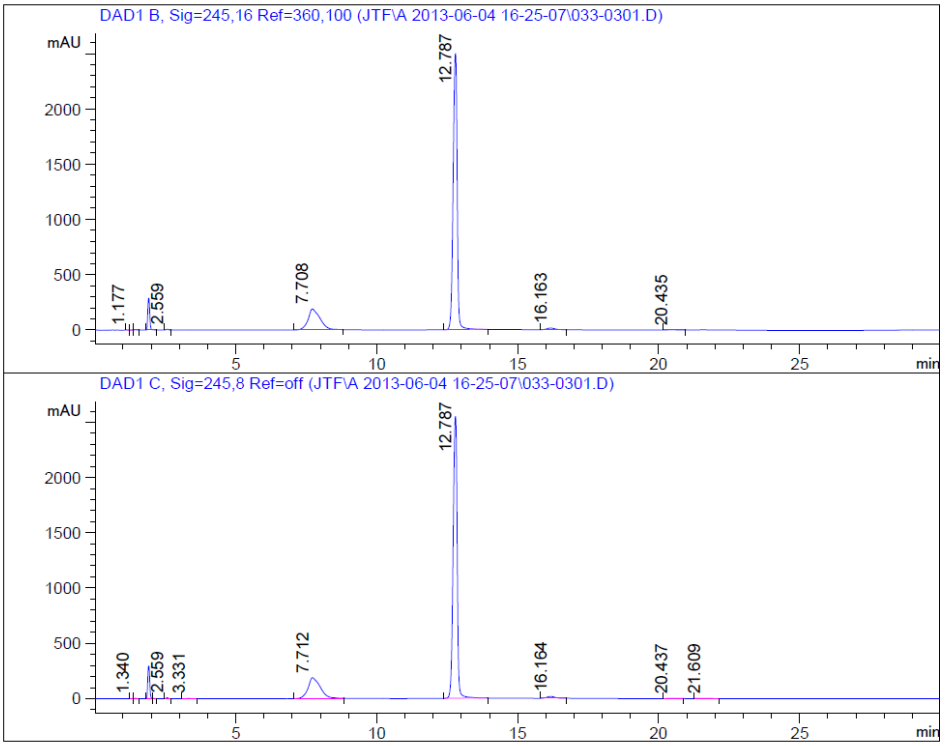


```
================================================================================
                  Customized Report: Area Pecent Report
================================================================================

Multiplier            :  1.000000
Dilution              :  1.000000
Uncalibrated Peaks    :  not reported

Signal  1: DAD1 B, Sig=245,16 Ref=360,100
```

Peak #	RT [min]	Type	Width [min]	Height [mAU]	Area %	Area [mAU*s]
1	1.177	BV	0.074	1.248	0.019	6.008
2	1.324	VV	0.109	1.732	0.038	12.357
3	1.433	VB	0.055	5.841	0.066	21.424
4	1.904	BB	0.081	288.180	4.335	1397.411
5	2.559	BB	0.070	8.068	0.112	36.085

Figure S6. *Cont.*

Data file : D:\DATA\JTF\A 2013-06-04 16-25-07\033-0301.D
Sample Name: 2-G 2

Peak #	RT [min]	Type	Width [min]	Height [mAU]	Area %	Area [mAU*s]
6	7.708	BB	0.392	190.515	17.425	5616.439
7	12.787	BB	0.156	2500.485	76.946	24801.738
8	16.163	BB	0.306	15.031	0.920	296.519
9	20.435	BB	0.306	2.268	0.139	44.764

Signal 2: DAD1 C, Sig=245,8 Ref=off

Peak #	RT [min]	Type	Width [min]	Height [mAU]	Area %	Area [mAU*s]
1	1.340	VV	0.108	1.220	0.028	9.154
2	1.432	VB	0.060	4.788	0.059	19.605
3	1.904	BV	0.080	296.711	4.322	1433.953
4	2.075	VB	0.061	2.119	0.026	8.583
5	2.559	BB	0.070	8.326	0.112	37.311
6	3.331	BB	0.177	1.109	0.039	13.028
7	7.712	BB	0.401	189.382	17.191	5703.253
8	12.787	BB	0.159	2551.865	76.942	25526.463
9	16.164	BB	0.306	17.410	1.041	345.519
10	20.437	BB	0.260	2.348	0.131	43.430
11	21.609	BB	0.338	1.448	0.108	35.778

Figure S7. The HPLC Chromatography of the derivative of D-Fructose.

```
Data file  : D:\DATA\JTF\A 2013-06-04 16-25-07\034-0401.D
Sample Name: 2-F                                                          1
================================================================================
Injection Date  : Tue, 4. Jun. 2013          Seq Line   :           4
Sample Name     : 2-F                        Location   :     Vial 34
Acq Operator    : SLL                        Inj. No.   :           1
                                             Inj. Vol.  :       20 µl

Acq. Method     : D:\DATA\JTF\A 2013-06-04 16-25-07\JTF.M
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last Changed    : Wed, 26. Jun. 2013, 10:02:45 am
                  (modified after loading)
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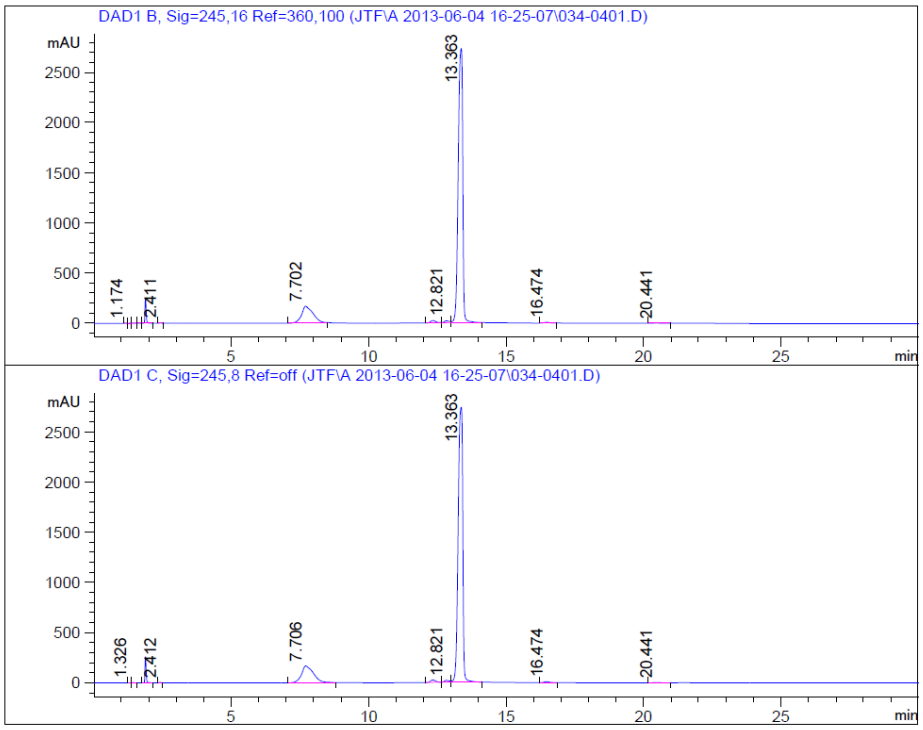


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================================================================================
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Multiplier            :  1.000000
Dilution              :  1.000000
Uncalibrated Peaks    :  not reported

Signal  1: DAD1 B, Sig=245,16 Ref=360,100
```

Peak #	RT [min]	Type	Width [min]	Height [mAU]	Area %	Area [mAU*s]
1	1.174	BV	0.075	1.480	0.019	7.263
2	1.321	VV	0.105	2.067	0.038	14.418
3	1.437	VB	0.068	5.063	0.064	24.098
4	1.649	BV	0.127	1.400	0.033	12.350
5	1.880	VB	0.048	253.648	2.051	775.399

```
Instrument 1      Fri, 14. Feb. 2014    11:22:53 am          Page   1 of 2
```

Figure S7. *Cont.*

Data file : D:\DATA\JTF\A 2013-06-04 16-25-07\034-0401.D
Sample Name: 2-F 2

Peak #	RT [min]	Type	Width [min]	Height [mAU]	Area %	Area [mAU*s]
6	2.411	BB	0.067	5.047	0.059	22.213
7	7.702	BB	0.389	168.612	13.038	4928.301
8	12.334	BV	0.223	24.305	0.922	348.687
9	12.821	VV	0.194	20.983	0.772	291.965
10	13.363	VB	0.183	2734.718	82.597	31221.105
11	16.474	BB	0.218	7.717	0.301	113.628
12	20.441	BB	0.296	2.159	0.106	39.998

Signal 2: DAD1 C, Sig=245,8 Ref=off

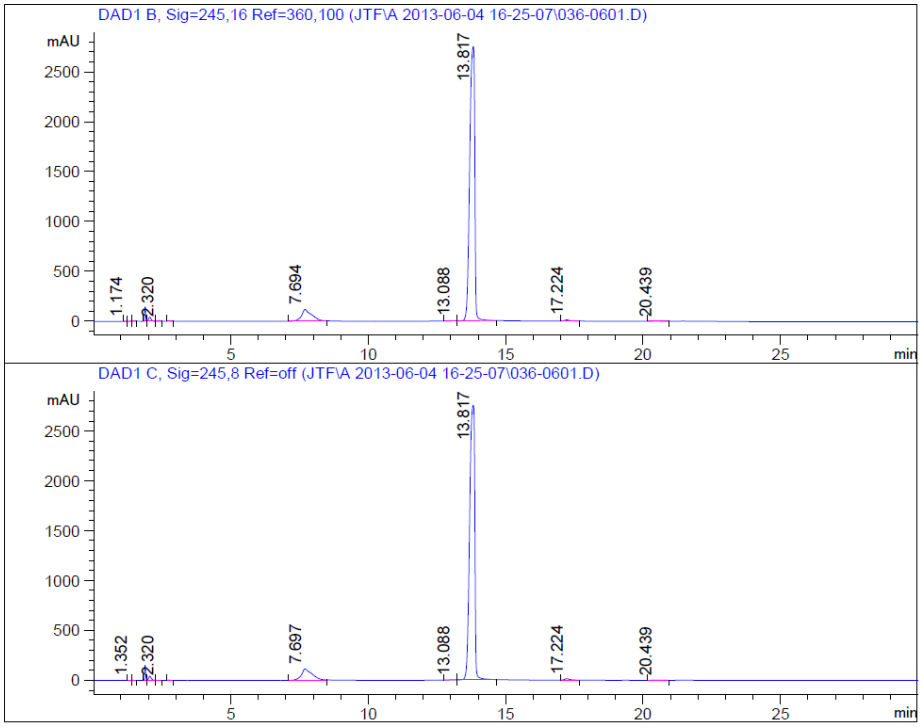
Peak #	RT [min]	Type	Width [min]	Height [mAU]	Area %	Area [mAU*s]
1	1.326	VV	0.105	1.267	0.023	8.993
2	1.437	VB	0.067	3.597	0.044	16.957
3	1.880	VB	0.047	262.097	2.044	789.036
4	2.412	BB	0.063	4.973	0.052	20.004
5	7.706	BB	0.402	167.927	13.180	5088.791
6	12.334	BV	0.223	25.181	0.934	360.697
7	12.821	VV	0.194	21.671	0.779	300.808
8	13.363	VB	0.187	2742.731	82.498	31853.342
9	16.474	BB	0.219	8.890	0.337	130.097
10	20.441	BB	0.296	2.281	0.109	42.274

Figure S8. The HPLC Chromatography of the derivative of D-Xylose.

```
Data file   : D:\DATA\JTF\A 2013-06-04 16-25-07\036-0601.D
Sample Name: 2-X                                                          1
================================================================================

Injection Date  : Tue, 4. Jun. 2013            Seq Line   :           6
Sample Name     : 2-X                          Location   :     Vial 36
Acq Operator    : SLL                          Inj. No.   :           1
                                               Inj. Vol.  :       20 µl

Acq. Method     : D:\DATA\JTF\A 2013-06-04 16-25-07\JTF.M
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last Changed    : Wed, 26. Jun. 2013, 10:02:45 am
                  (modified after loading)
```




```
================================================================================
                    Customized Report: Area Pecent Report
================================================================================


Multiplier            :  1.000000
Dilution              :  1.000000
Uncalibrated Peaks    :  not reported

Signal  1: DAD1 B, Sig=245,16 Ref=360,100

 |Peak |   RT     |  Type  | Width  |  Height  | Area % |    Area    |
 |  #  |  [min]   |        | [min]  |  [mAU]   |   %    |  [mAU*s]   |
 |-----|----------|--------|--------|----------|--------|------------|
 |    1|     1.174|BV      |  0.075|     1.172|   0.014|       5.560|
 |    2|     1.352|VV      |  0.123|     1.629|   0.030|      11.868|
 |    3|     1.434|VB      |  0.056|     5.276|   0.050|      19.765|
 |    4|     1.874|BV      |  0.044|   148.290|   1.026|     401.687|
 |    5|     2.042|VV      |  0.102|    41.796|   0.718|     280.888|

Instrument 1      Fri, 14. Feb. 2014    11:23:57 am          Page   1 of 2
```

Figure S8. *Cont.*

Data file : D:\DATA\JTF\A 2013-06-04 16-25-07\036-0601.D
Sample Name: 2-X 2

Peak #	RT [min]	Type	Width [min]	Height [mAU]	Area %	Area [mAU*s]
6	2.320	VB	0.095	1.248	0.022	8.482
7	2.751	BB	0.083	2.871	0.040	15.614
8	7.694	BB	0.349	117.653	7.858	3075.641
9	13.088	BV	0.200	1.247	0.042	16.467
10	13.817	VB	0.209	2749.947	89.662	35092.391
11	17.224	BB	0.209	12.134	0.434	169.819
12	20.439	BB	0.290	2.197	0.103	40.351

Signal 2: DAD1 C, Sig=245,8 Ref=off

Peak #	RT [min]	Type	Width [min]	Height [mAU]	Area %	Area [mAU*s]
1	1.352	VV	0.104	1.131	0.020	7.982
2	1.434	VB	0.056	4.140	0.040	15.773
3	1.874	BV	0.044	154.247	1.047	417.318
4	2.042	VV	0.102	42.816	0.721	287.495
5	2.320	VB	0.095	1.282	0.022	8.736
6	2.751	BB	0.083	2.950	0.040	16.003
7	7.697	BB	0.358	114.655	7.751	3089.331
8	13.088	BV	0.197	1.252	0.041	16.230
9	13.817	VB	0.212	2753.128	89.717	35760.539
10	17.224	BB	0.210	14.041	0.496	197.565
11	20.439	BB	0.291	2.312	0.106	42.217