

Supplementary Materials

of

**Organocatalytic Asymmetric Aldol Reaction of
Arylglyoxals and Hydroxyacetone: Enantioselective
Synthesis of 2,3-Dihydroxy-1,4-Diones**

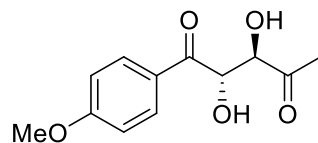
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Key Laboratory of Applied Chemistry of Chongqing Municipality, School of Chemistry and Chemical Engineering, Southwest University, Chongqing 400715, China

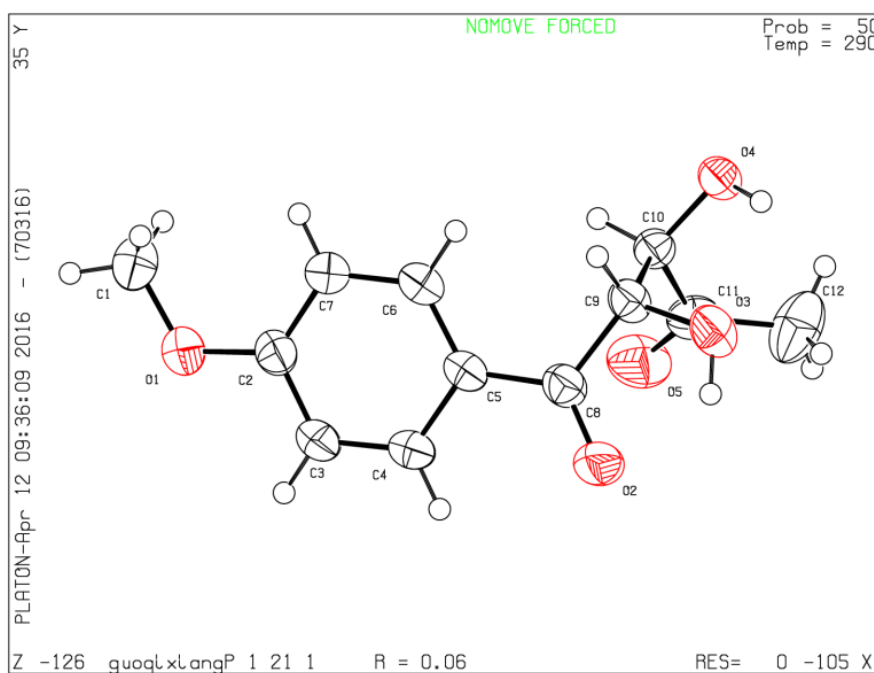
* Correspondence: wenwei1989@swu.edu.cn; qxguo@swu.edu.cn.

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1. Crystallographic data

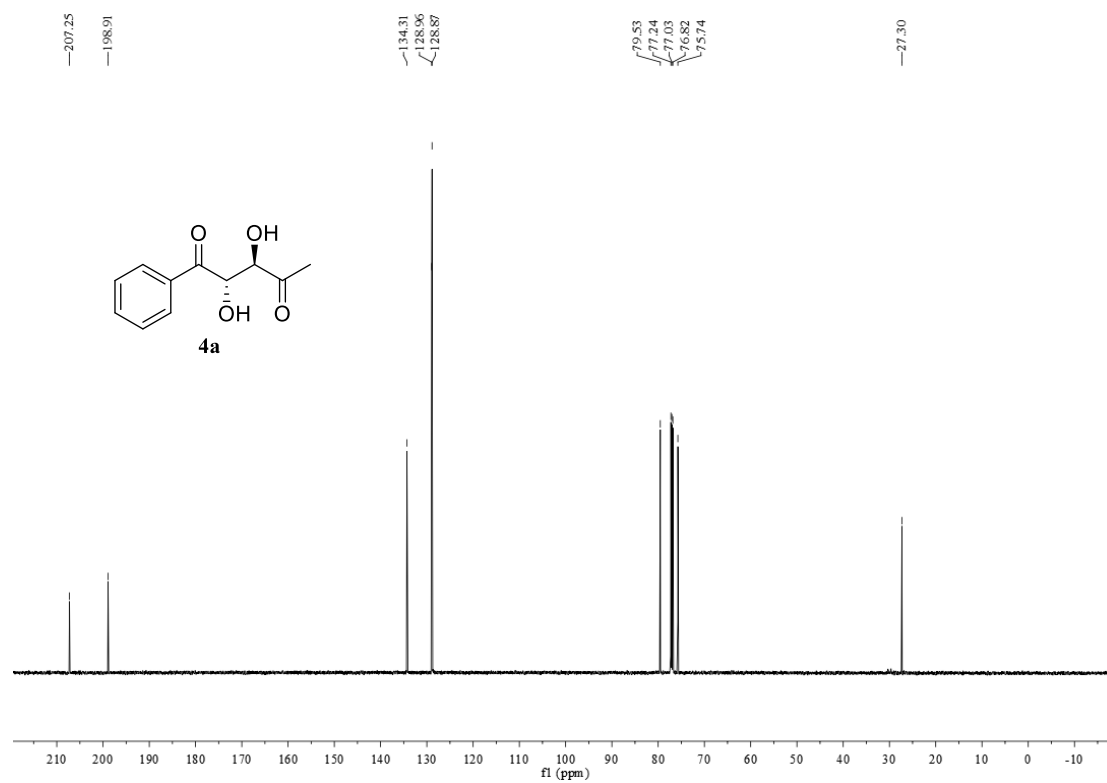
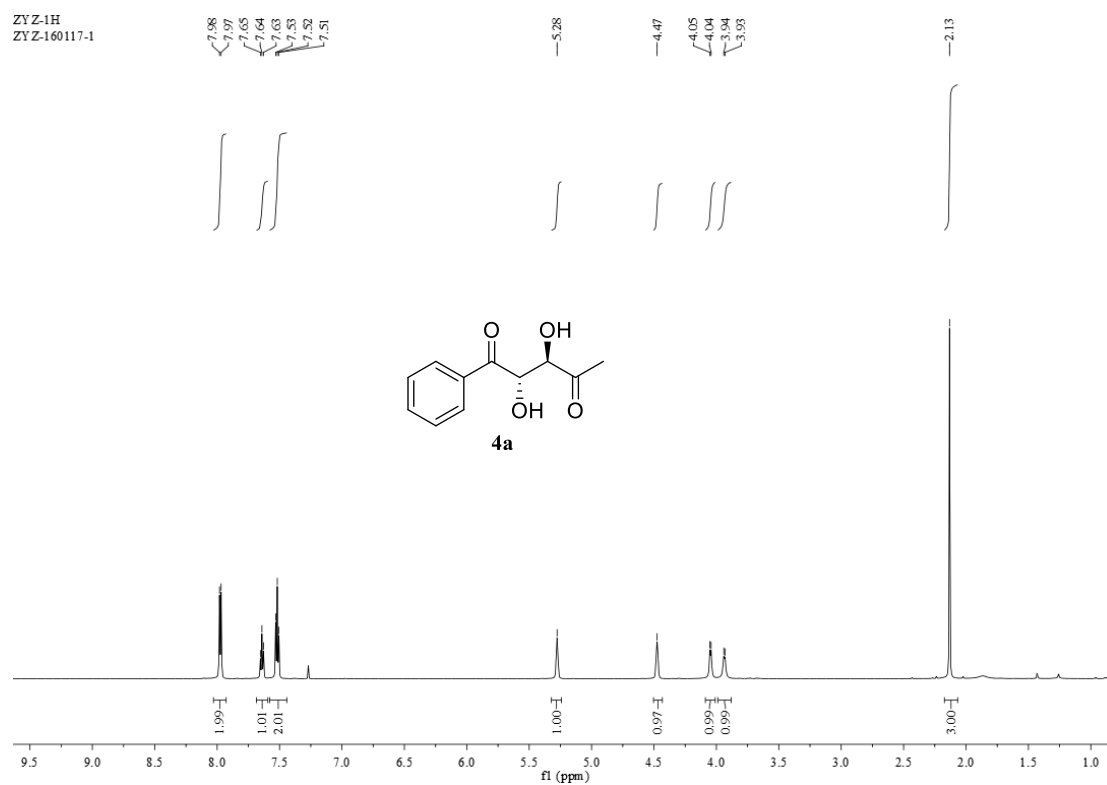


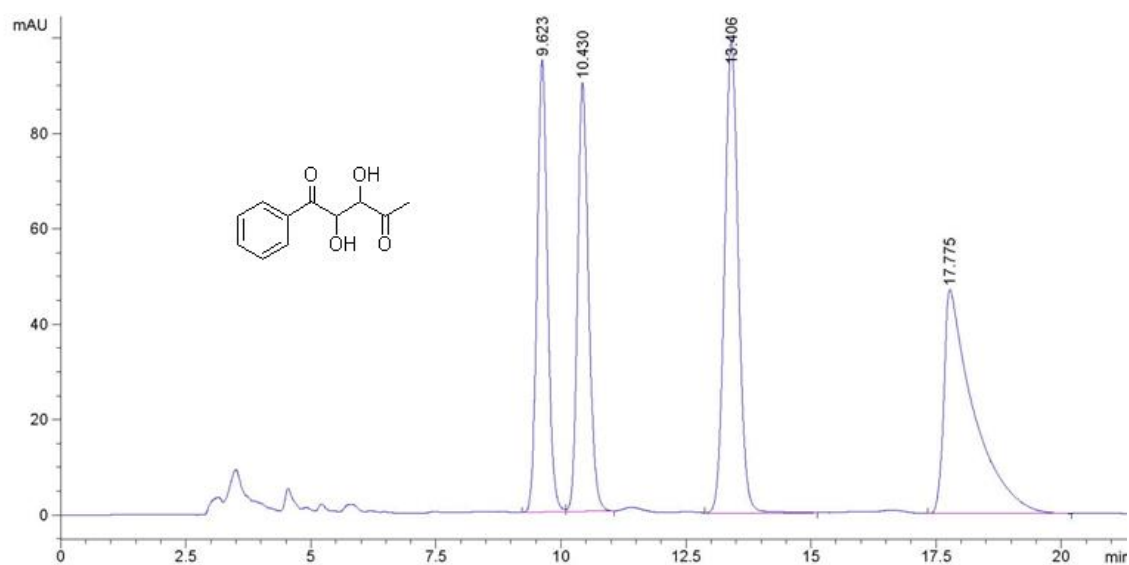
(2*S*,3*R*)-2,3-dihydroxy-1-(4-methoxyphenyl)pentane-1,4-dione



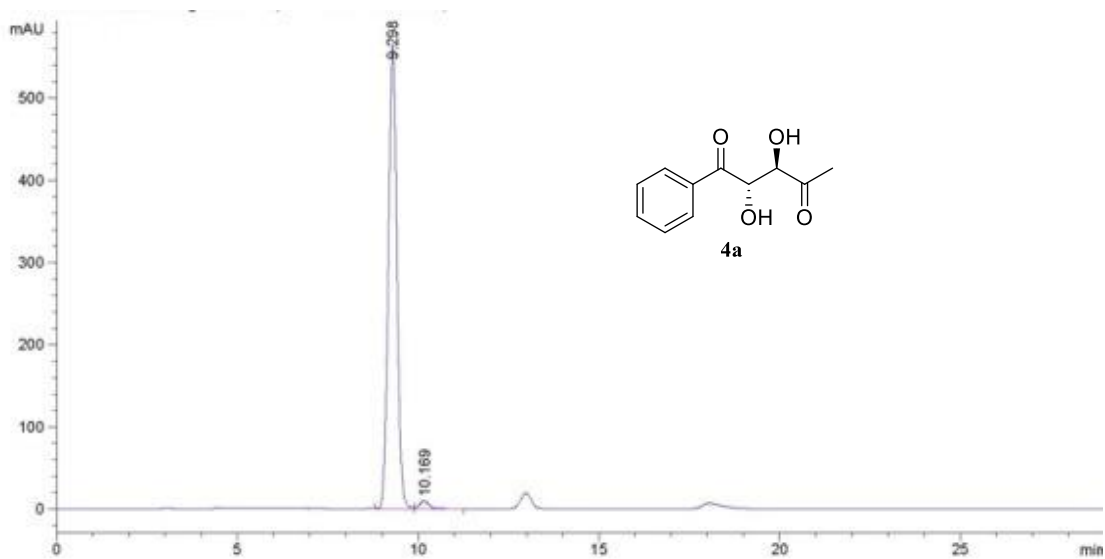
Chemical Formula	C ₁₂ H ₁₄ O ₅
Formula weight	238.23
Temperature	290.29(17)K
Wavelength	1.54184Å
Crystal system, space group	monoclinic, P 1 21 1
a/Å	6.4061(2)
b/Å	5.5861(2)
c/Å	16.4905(5)
α/°	90
β/°	91.091(3)
γ/°	90
V/Å ³	590.01(4)
Z, Calculate density	2, 1.341g/cm ³

2. Spectrums of ^1H NMR, ^{13}C NMR and HPLC





Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	9.623	BV	0.2237	1379.68042	94.78895	21.0450
2	10.430	VB	0.2331	1368.21118	89.80470	20.8701
3	13.406	BB	0.2949	1898.57874	99.08701	28.9600
4	17.775	BB	0.5429	1909.38745	46.81028	29.1249



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	9.298	BV	0.2515	9231.80664	565.74780	98.1310
2	10.169	VB	0.2615	175.83051	10.09313	1.8690

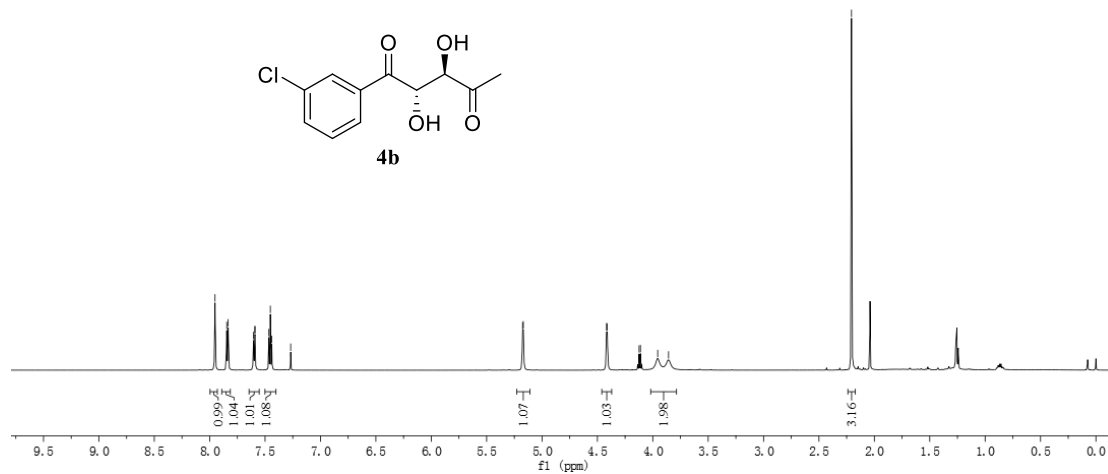
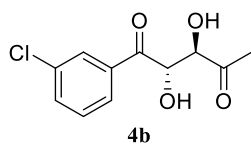
YX-1H
YX-1-14-2

7.95
7.85
7.83
7.60
7.59
7.47
7.45
7.44
7.27

5.18
5.17

4.42
4.41
4.12
4.11
3.86
3.86

-2.21



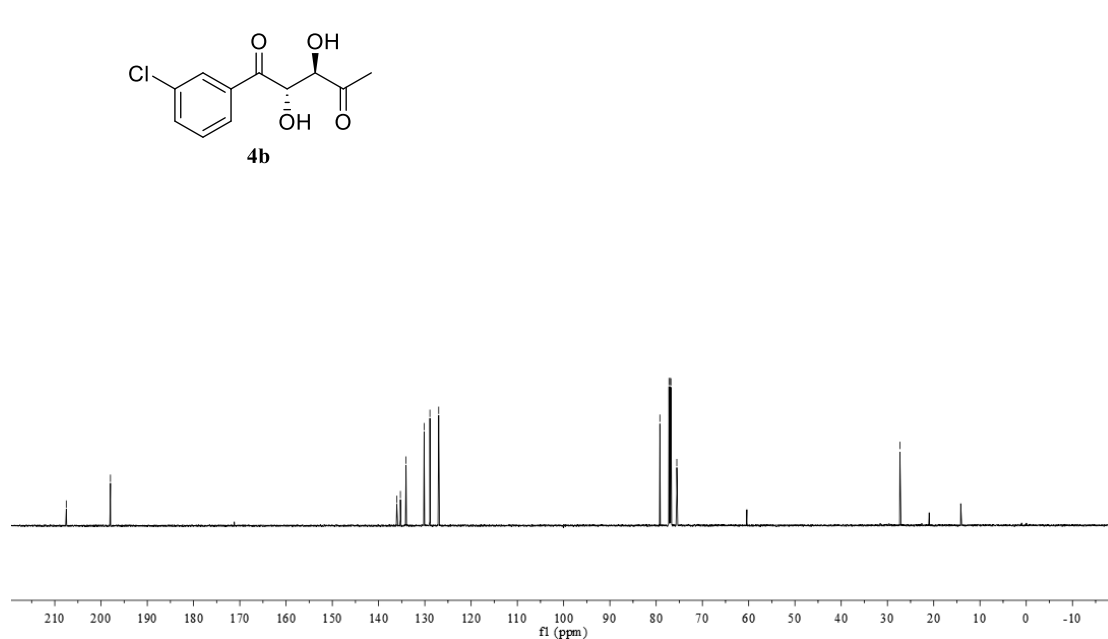
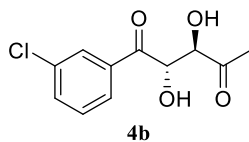
YX-13C
YX-1-14-2

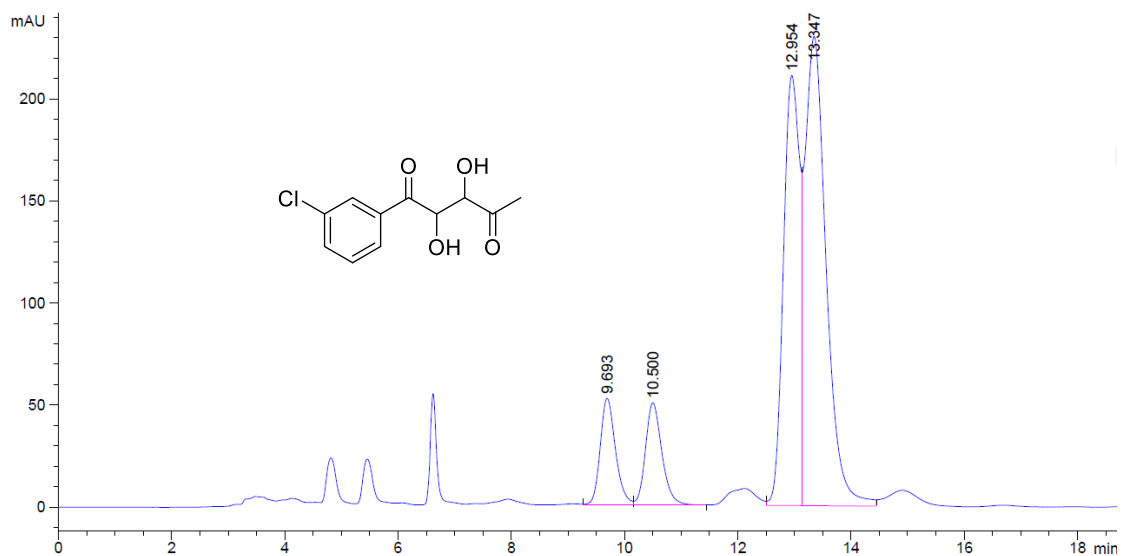
-202.51
-197.96

136.07
135.29
134.07
130.16
128.90
127.01

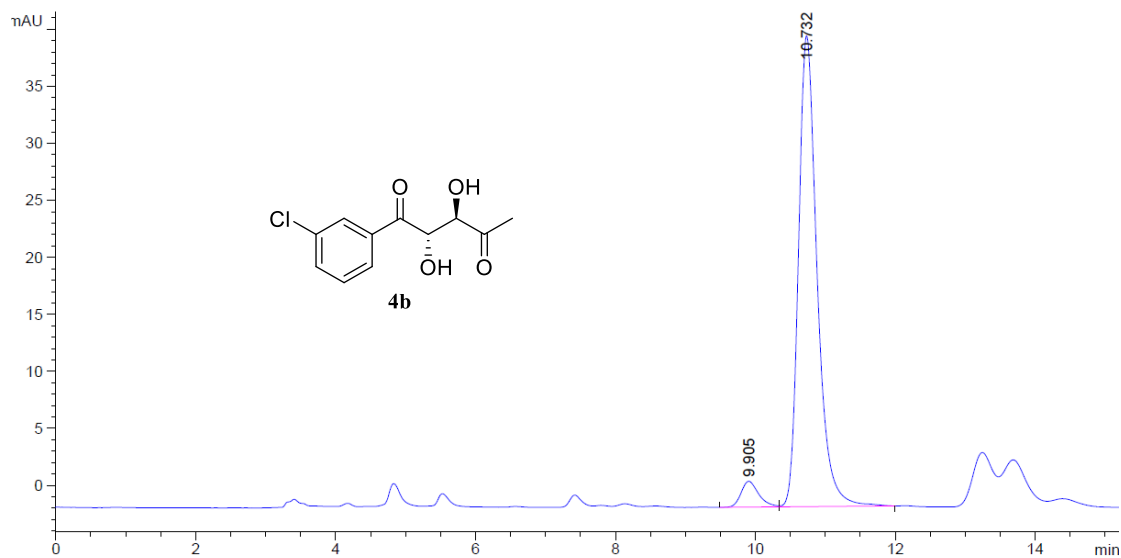
79.19
77.23
77.01
76.80
75.53

-27.31



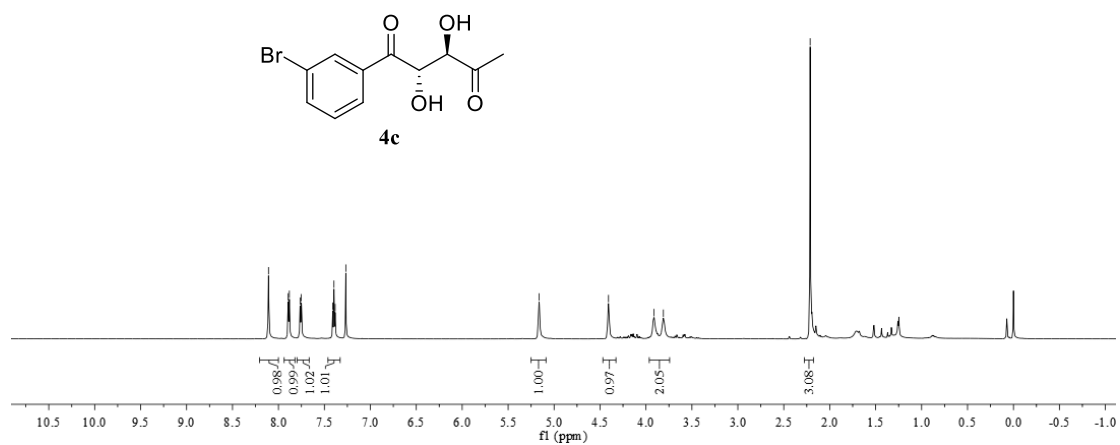
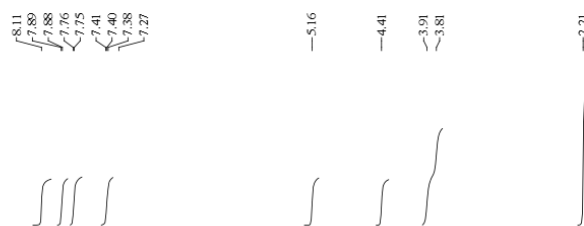


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	9.693	VV	0.2857	978.55841	52.21511	8.0325
2	10.500	VB	0.3076	1005.31732	49.97211	8.2521
3	12.954	VV	0.3038	4197.55957	210.78369	34.4556
4	13.347	VV	0.3832	6001.08203	229.97369	49.2598

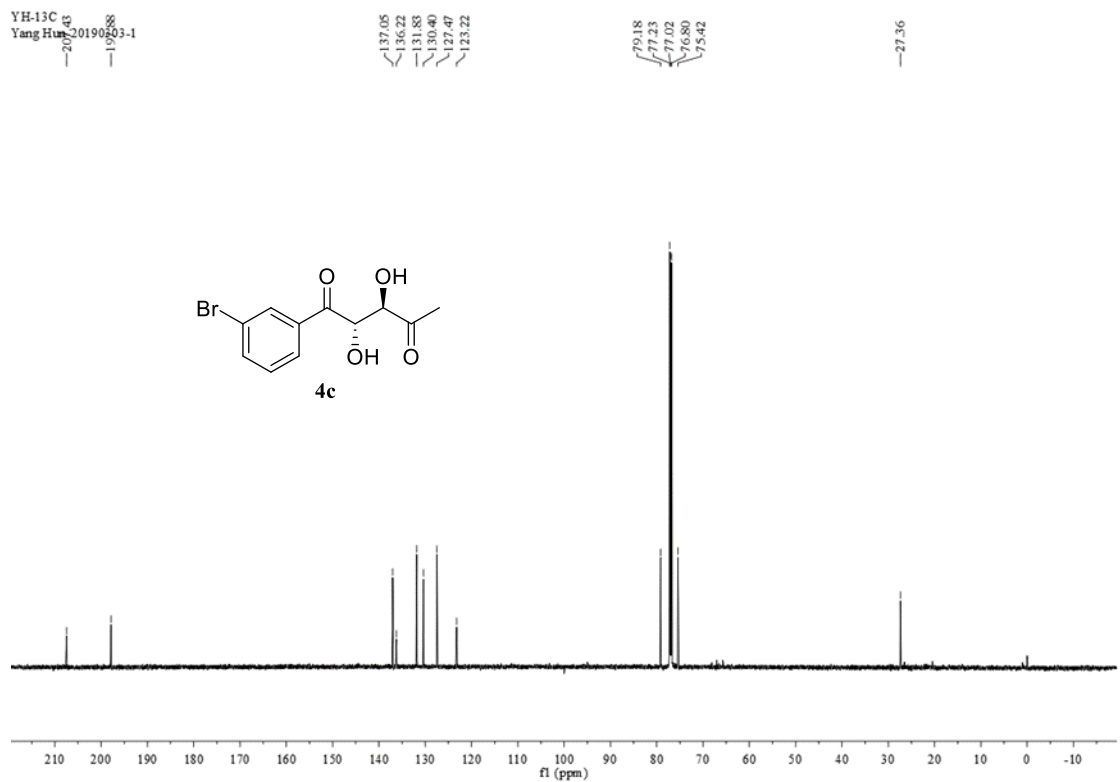


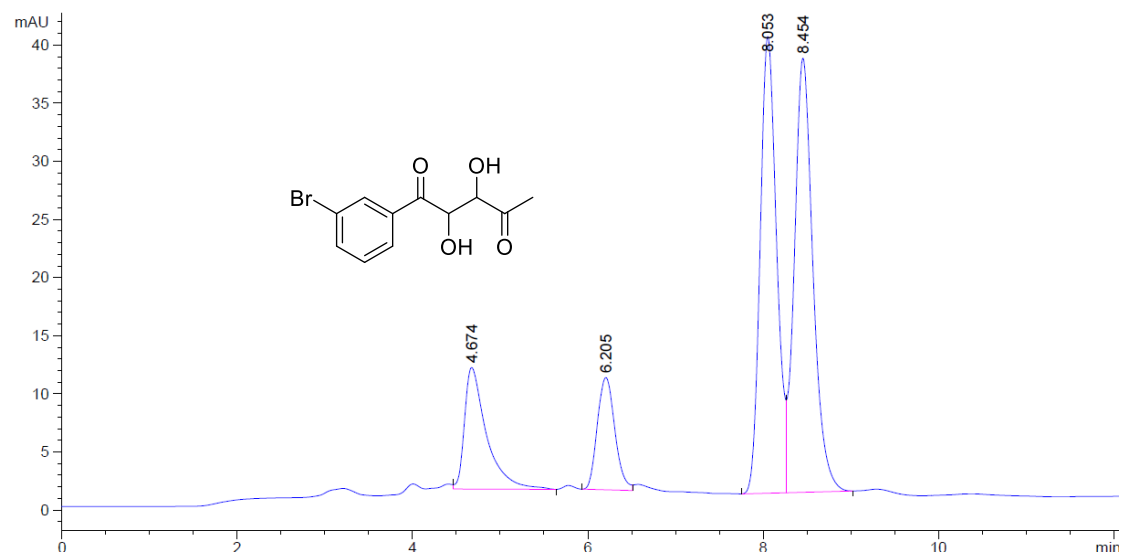
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	9.905	BV	0.2667	39.61375	2.26431	4.9358
2	10.732	VB	0.2810	762.96625	41.30092	95.0642

YH-1H
Yang Hun-20190303-1

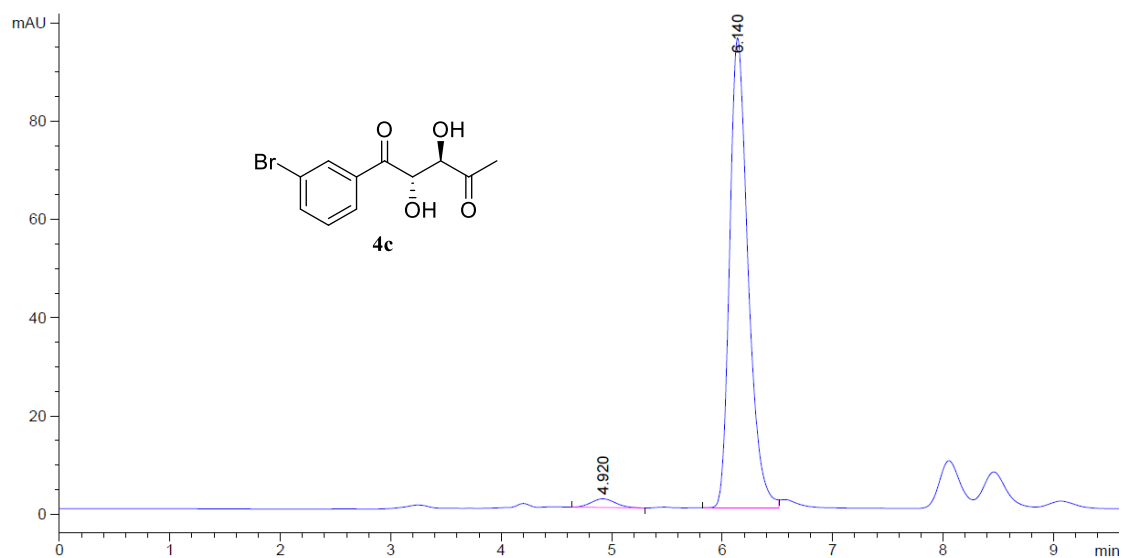


YH-13C
Yang Hun-20190303-1



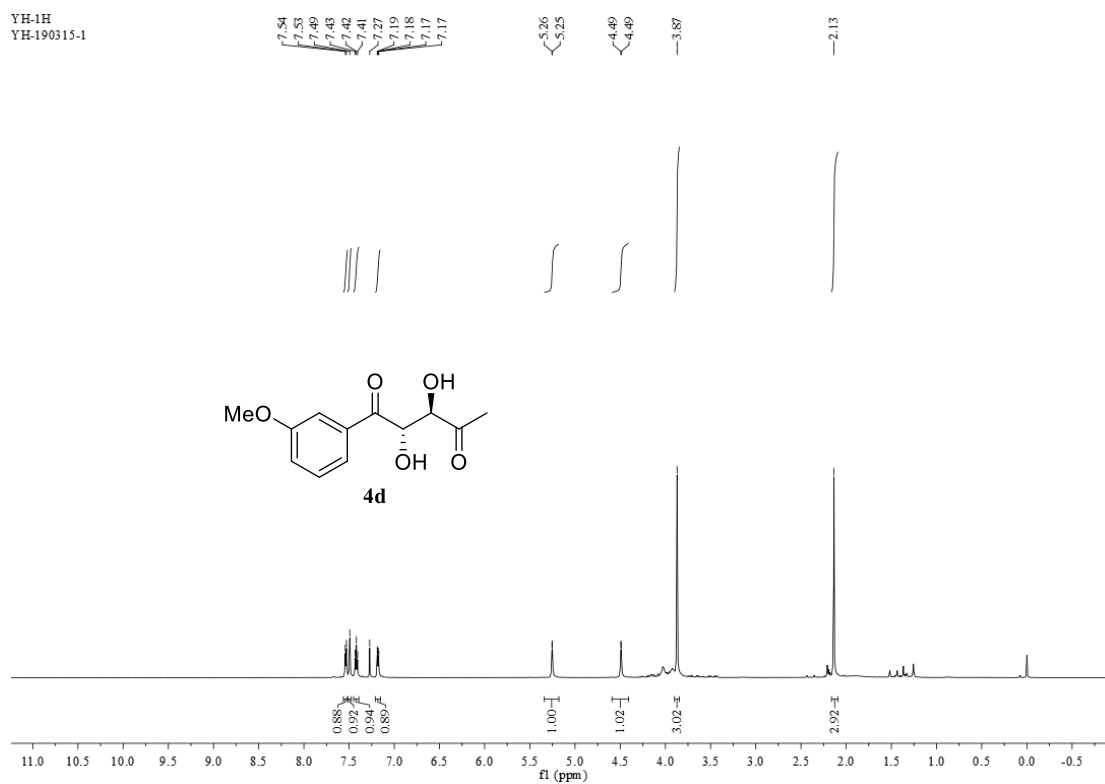


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	4.674	VB	0.2561	182.46974	10.45192	13.2110
2	6.205	BV	0.2211	134.90280	9.66418	9.7671
3	8.053	BV	0.1999	511.22772	39.28375	37.0133
4	8.454	VB	0.2236	552.60016	37.35242	40.0087

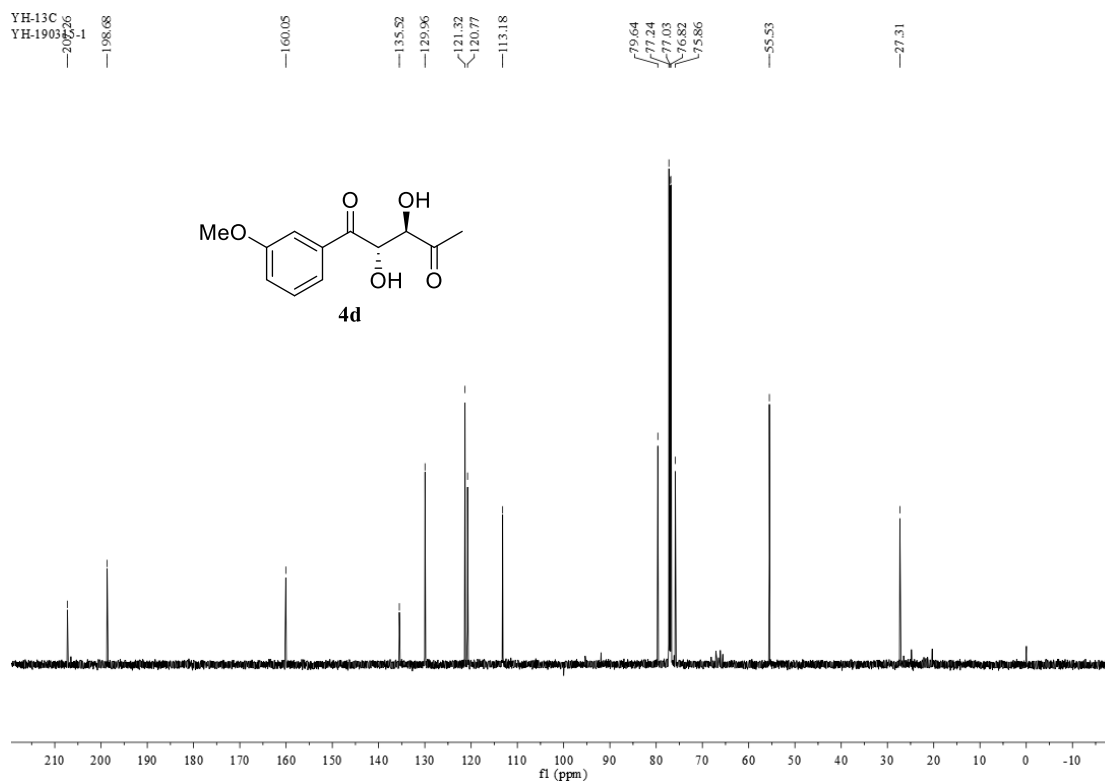


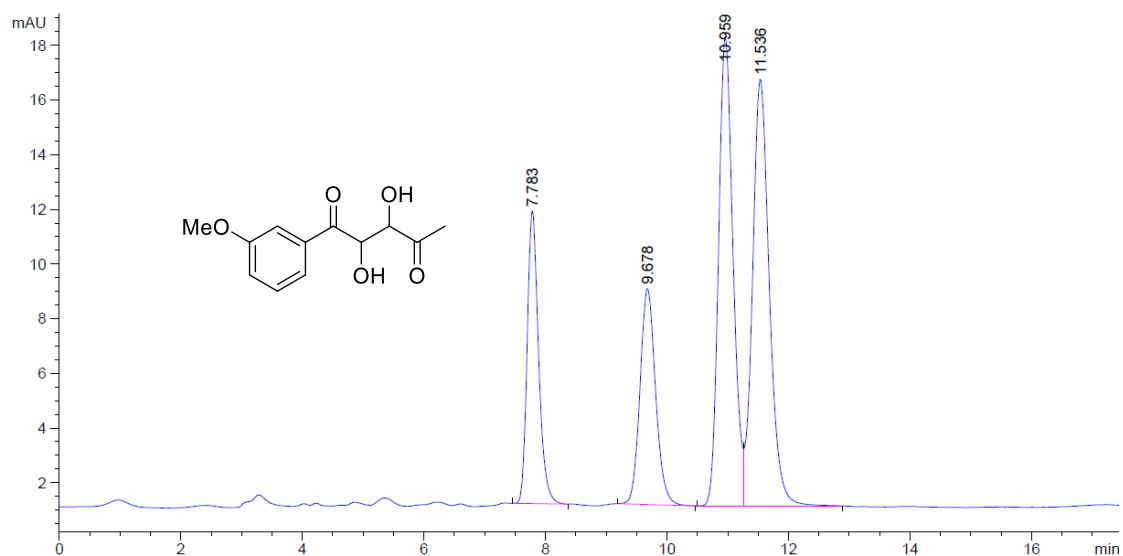
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	4.920	BB	0.2383	27.06308	1.76732	2.3814
2	6.140	BV	0.1761	1109.36414	95.64050	97.6186

YH-1H
YH-190315-1

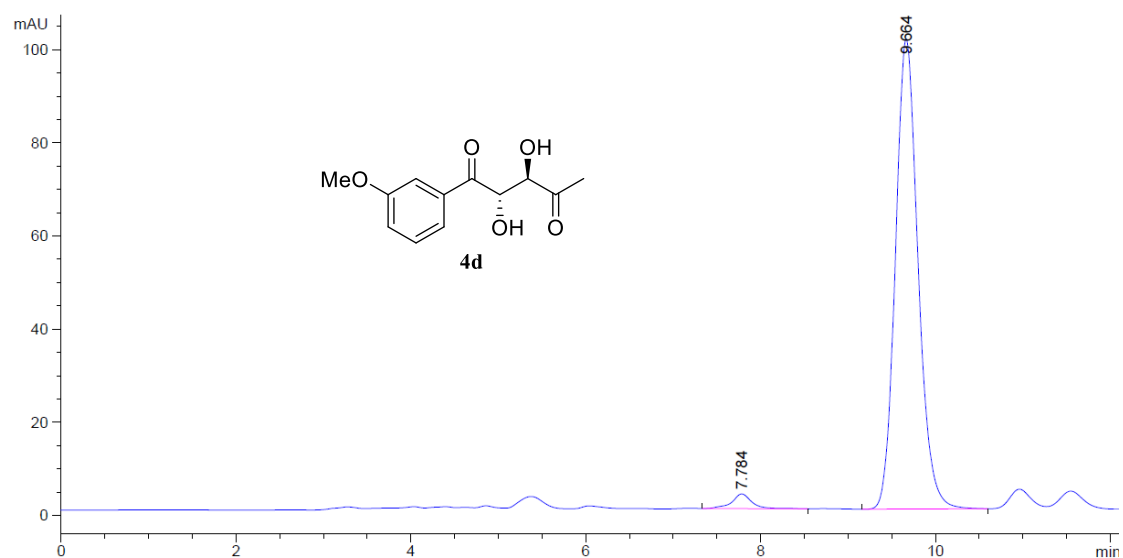


YH-13C
YH-190315-1



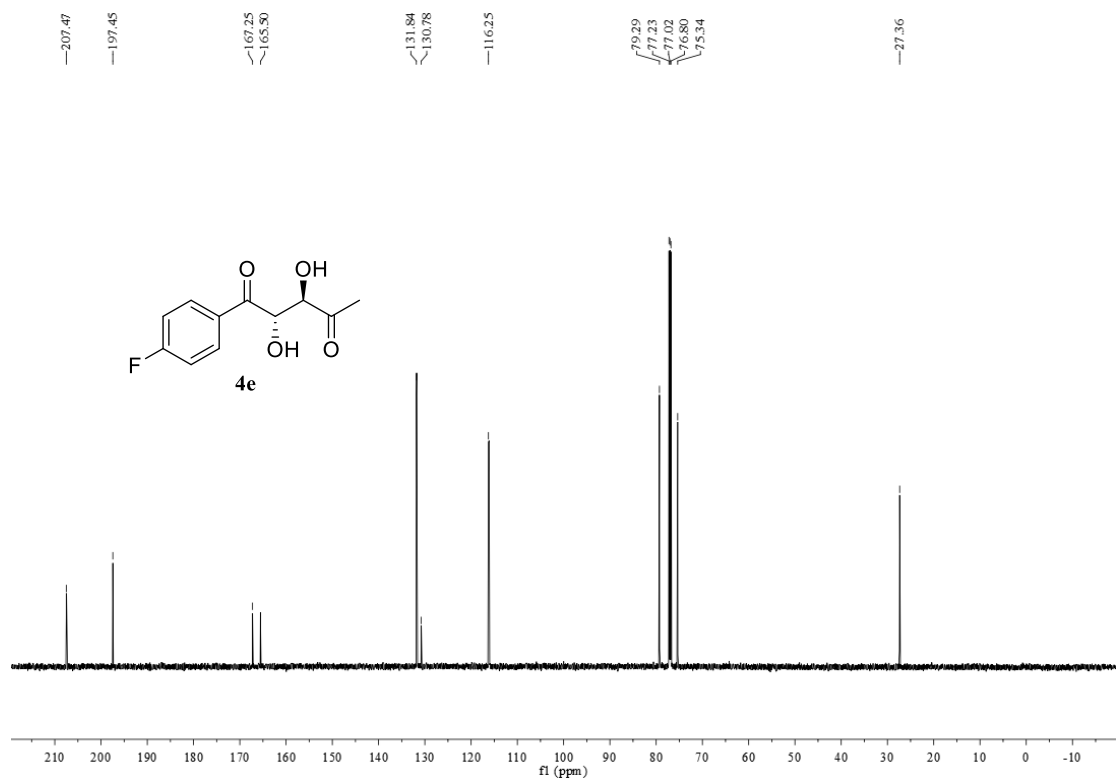
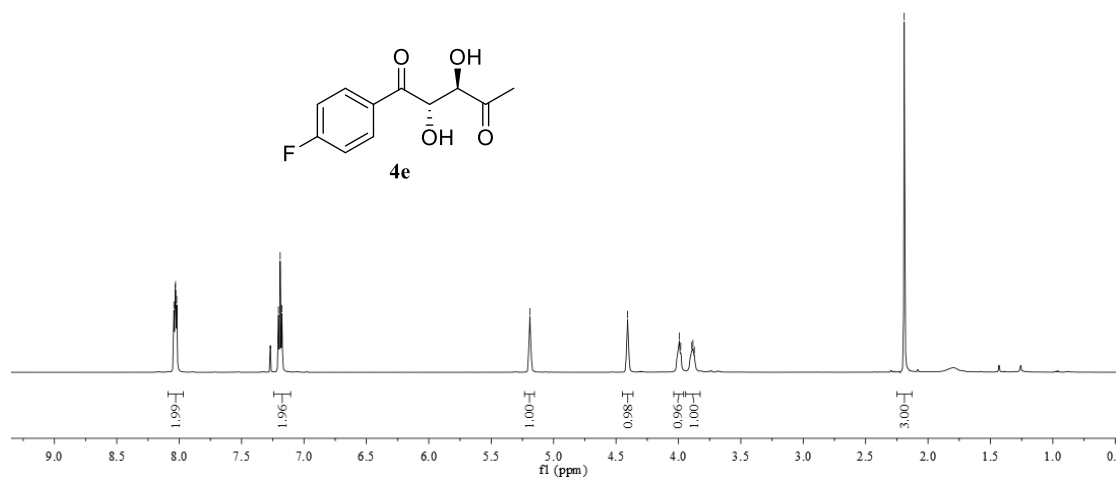


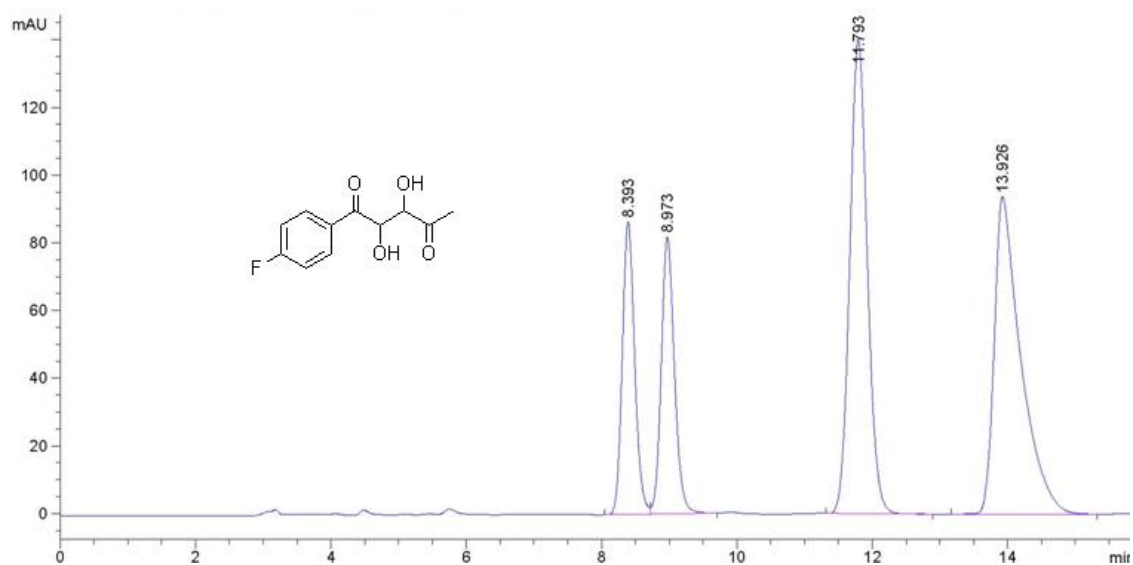
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.783	BB	0.1979	138.89966	10.70775	16.0708
2	9.678	BB	0.2731	140.54344	7.89927	16.2609
3	10.959	BV	0.2551	284.94641	17.14184	32.9684
4	11.536	VB	0.2926	299.91089	15.60809	34.6998



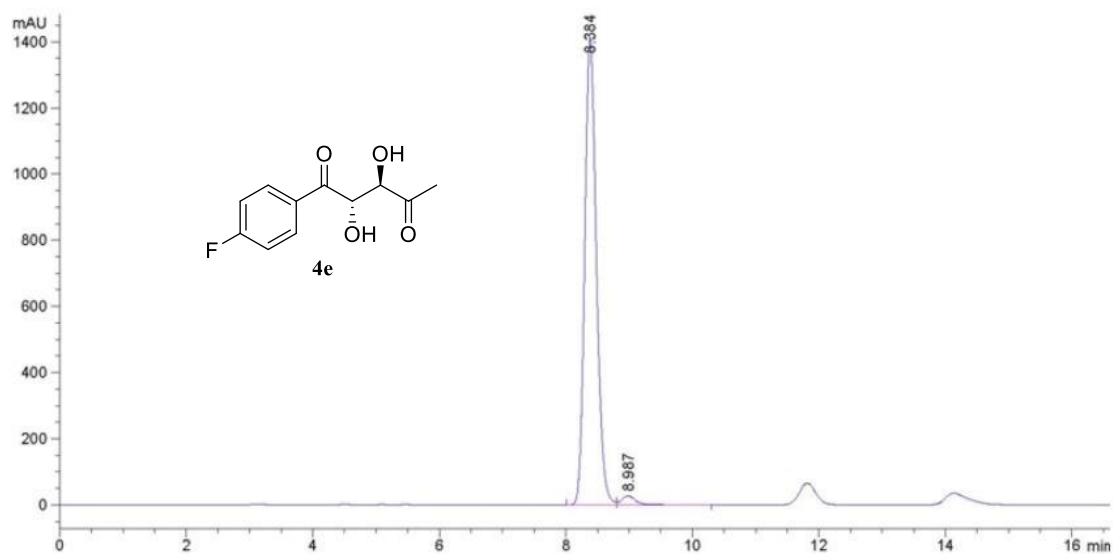
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.784	BB	0.2325	50.58262	3.15048	2.7155
2	9.664	BB	0.2749	1812.14502	100.96157	97.2845

ZYZ-1H
ZYZ-160125-1



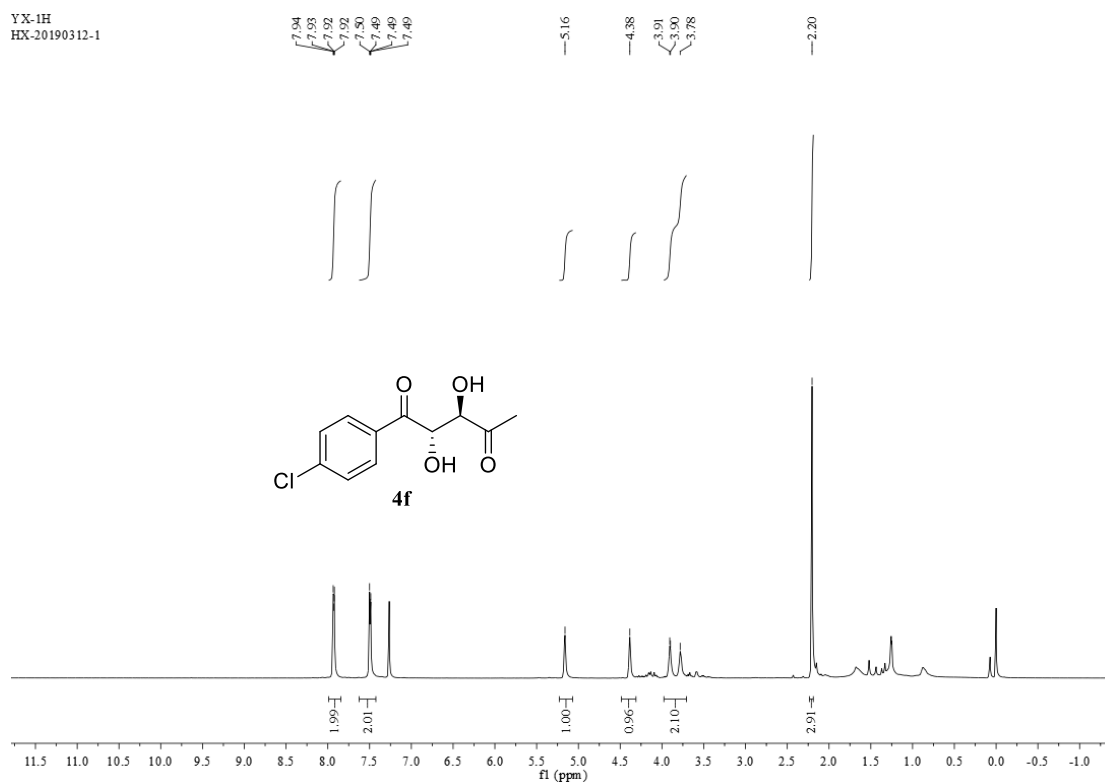


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	8.393	BV	0.1956	1092.69885	86.41489	15.0804
2	8.973	VB	0.2066	1100.52393	81.74480	15.1884
3	11.793	BB	0.2744	2508.90356	140.10246	34.6254
4	13.926	BB	0.3834	2543.71313	93.77689	35.1058

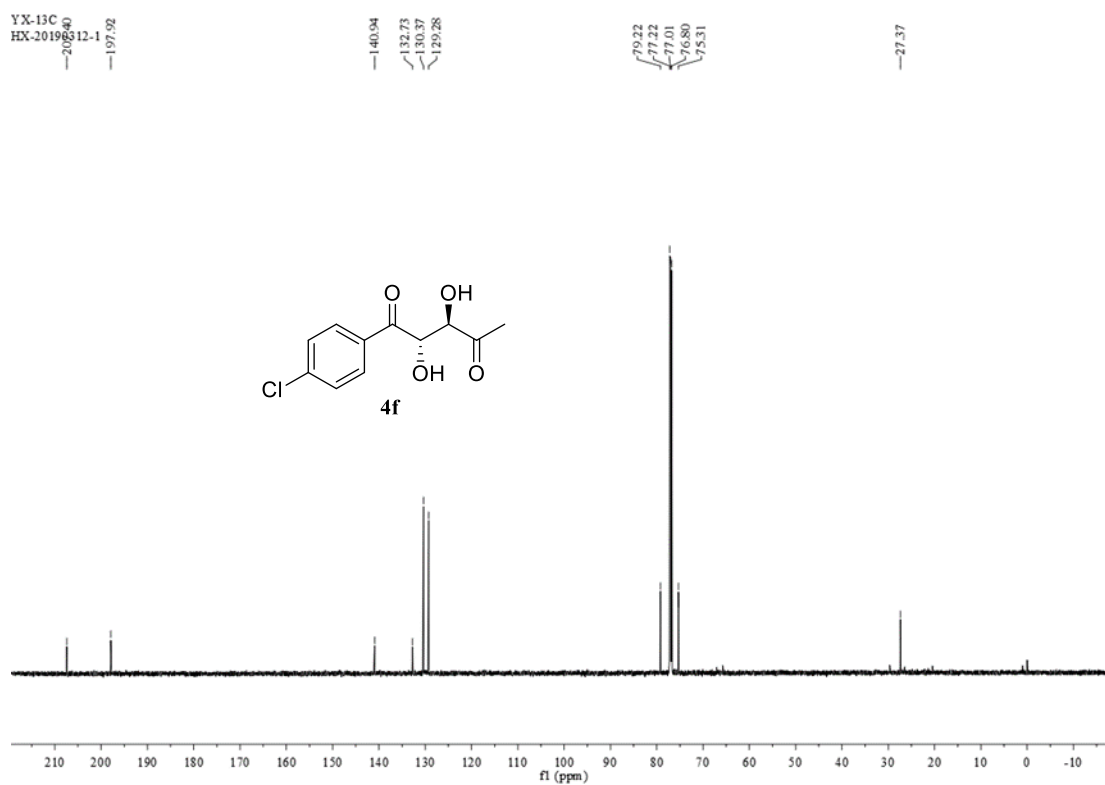


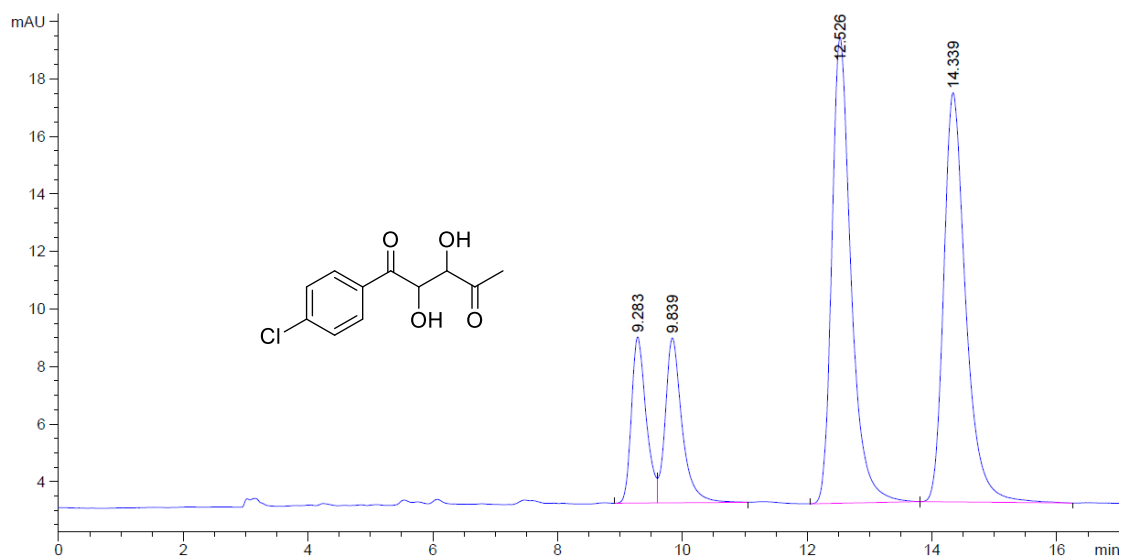
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	8.384	BV	0.1965	1.79747e4	1412.65088	97.7381
2	8.987	VB	0.2273	415.98679	27.07613	2.2619

YX-1H
HX-20190312-1

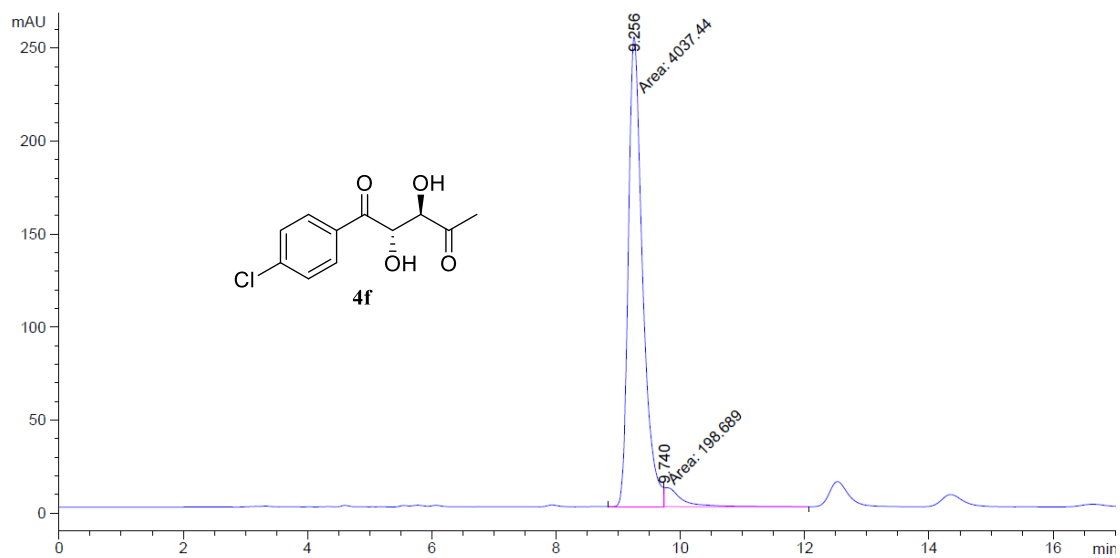


YX-13C
HX-20190312-1



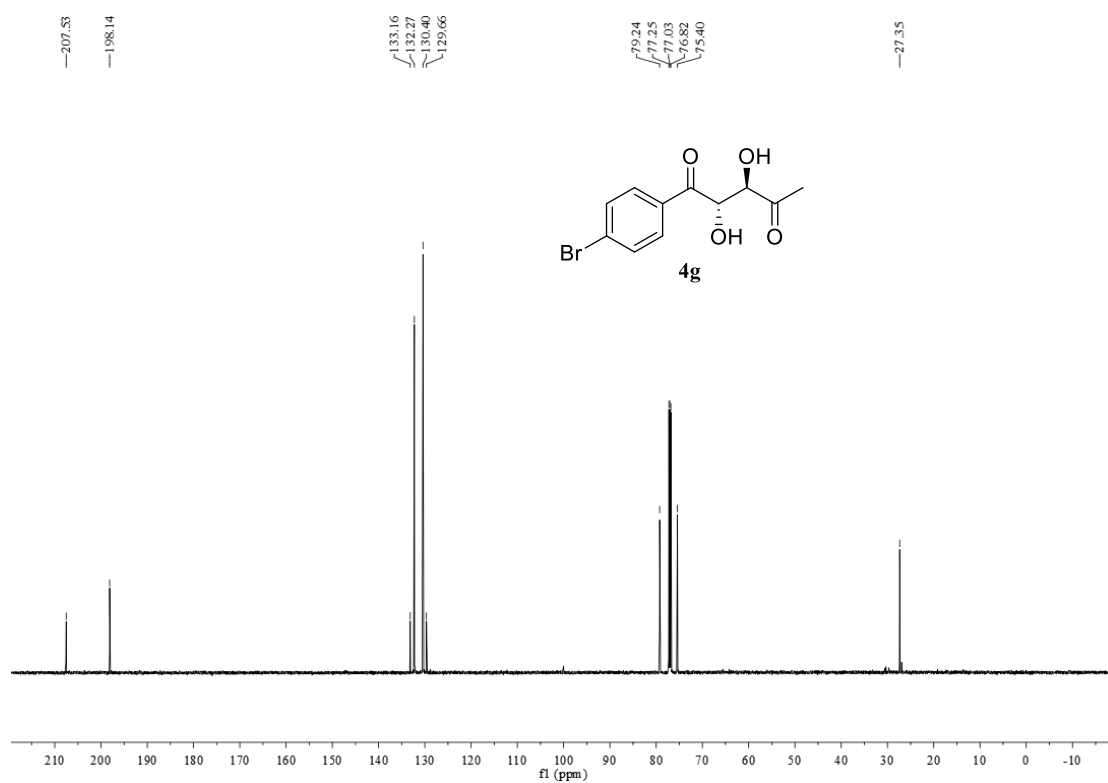
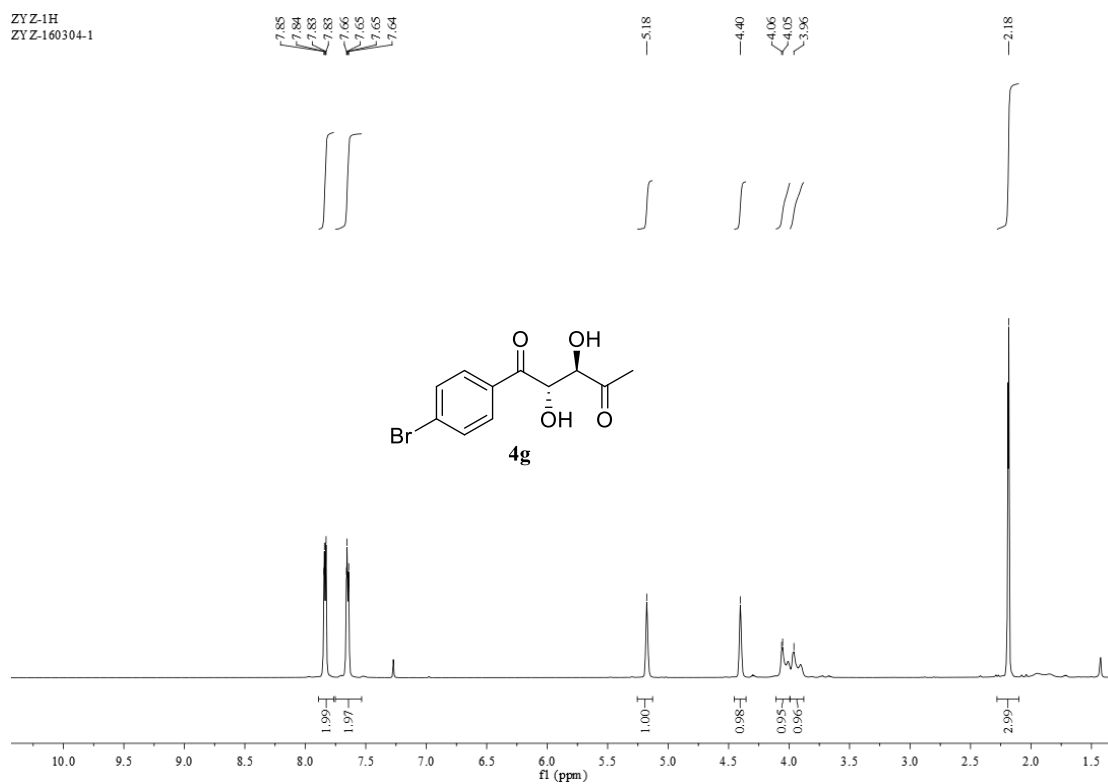


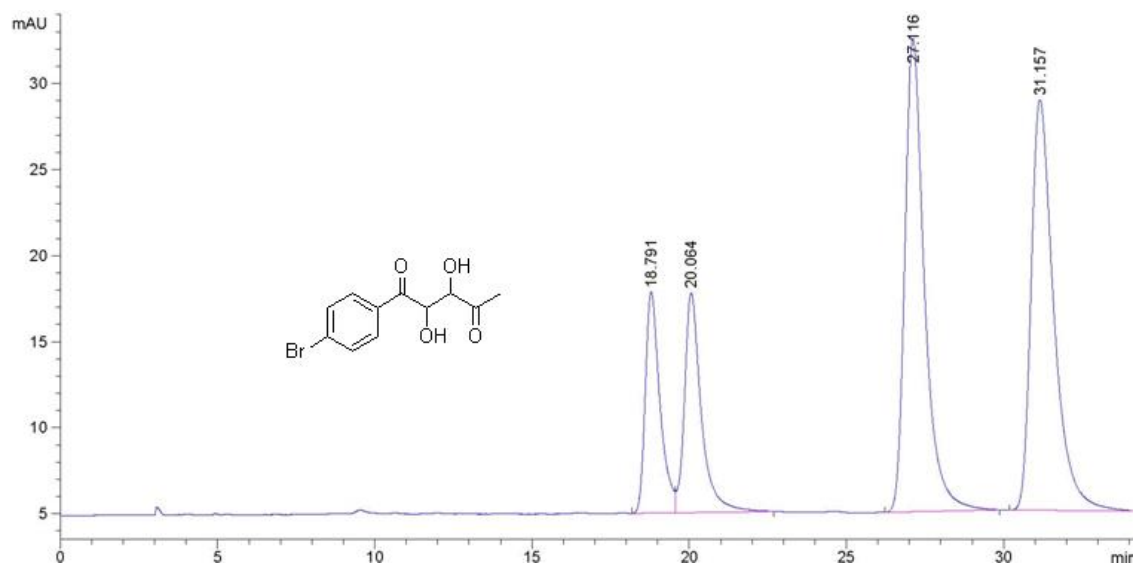
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	9.283	BV	0.2480	94.63755	5.77450	10.5309
2	9.839	VB	0.2757	106.86500	5.73339	11.8915
3	12.526	BB	0.3217	347.79559	16.20674	38.7014
4	14.339	BB	0.3695	349.36639	14.22785	38.8762



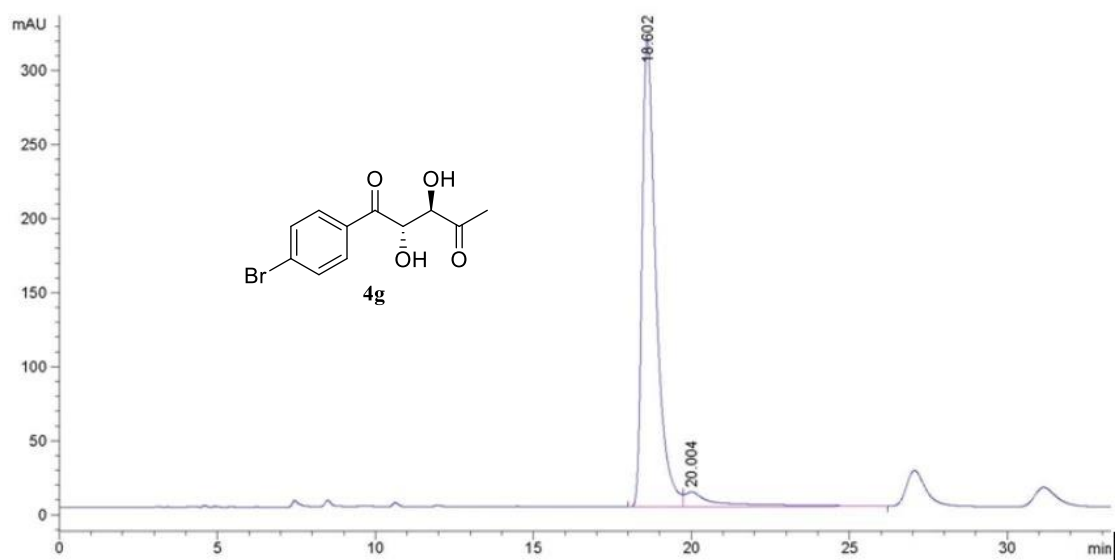
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1	9.256	MF	0.2664	4037.43823	252.56102	95.3097
2	9.740	FM	0.3238	198.68918	10.22630	4.6903

ZYZ-1H
 ZYZ-160304-1



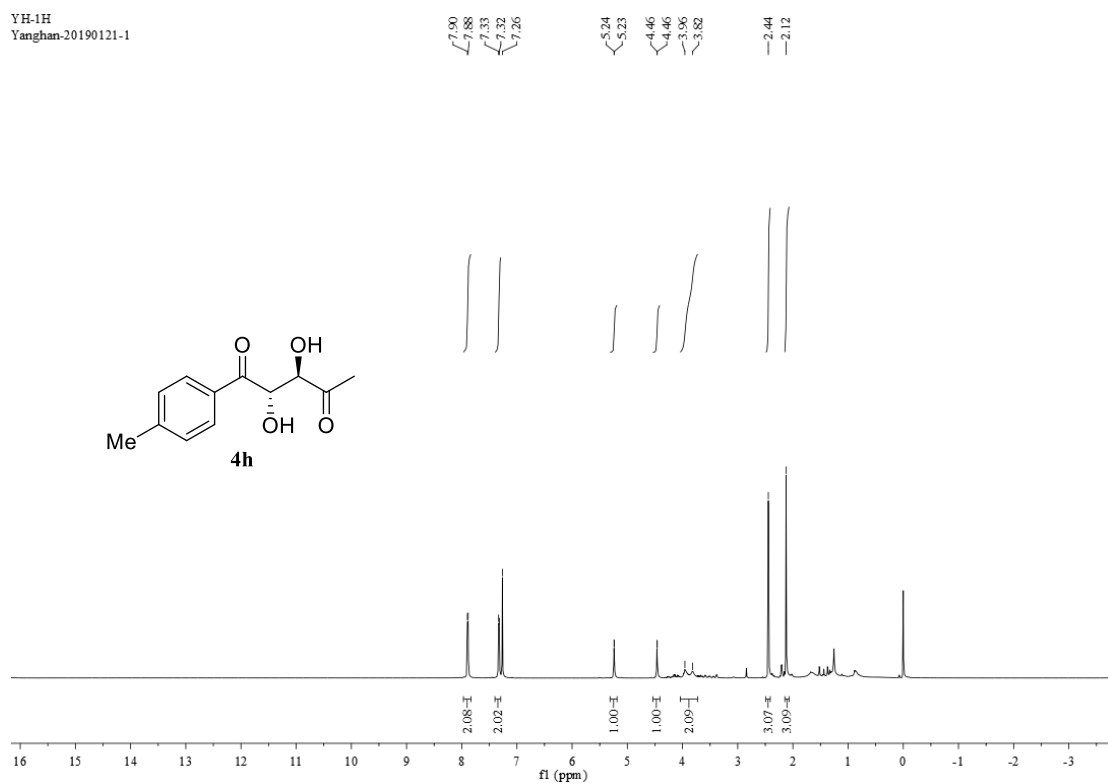


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	18.791	BV	0.4838	416.38272	12.86677	12.7201
2	20.064	VB	0.5456	473.31842	12.78037	14.4594
3	27.116	BB	0.6450	1188.08020	27.51219	36.2947
4	31.157	BBA	0.7590	1195.64465	23.87403	36.5258

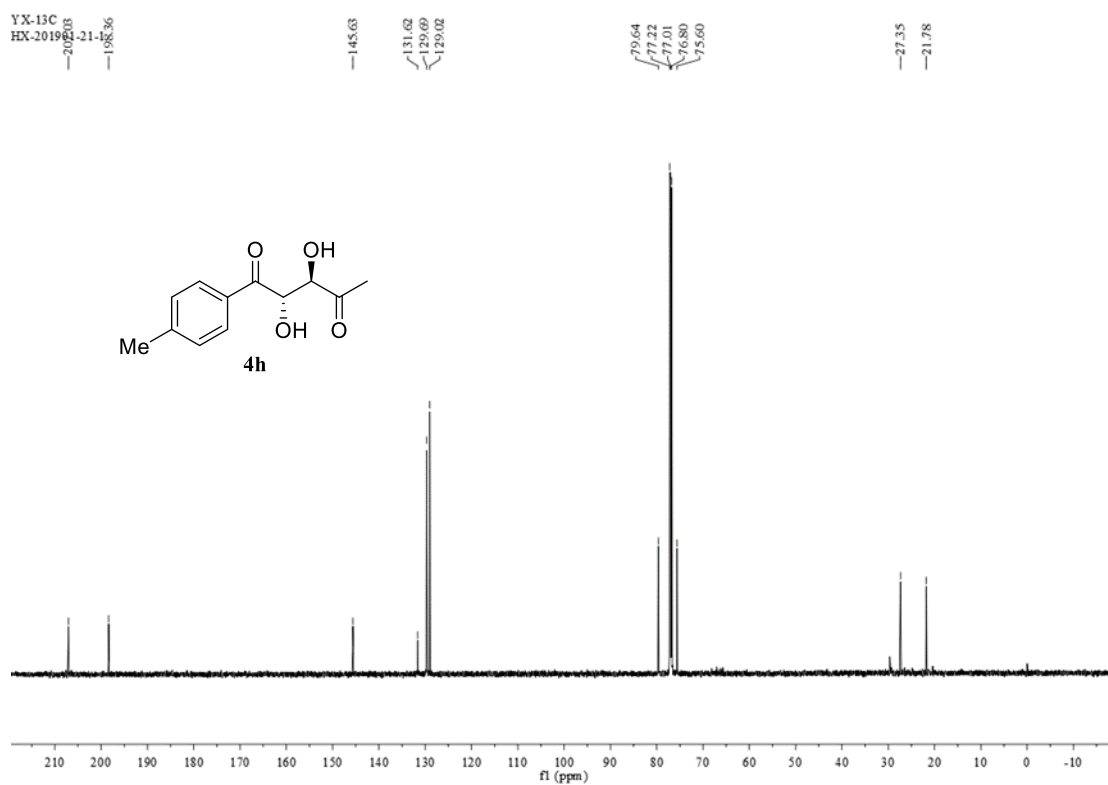


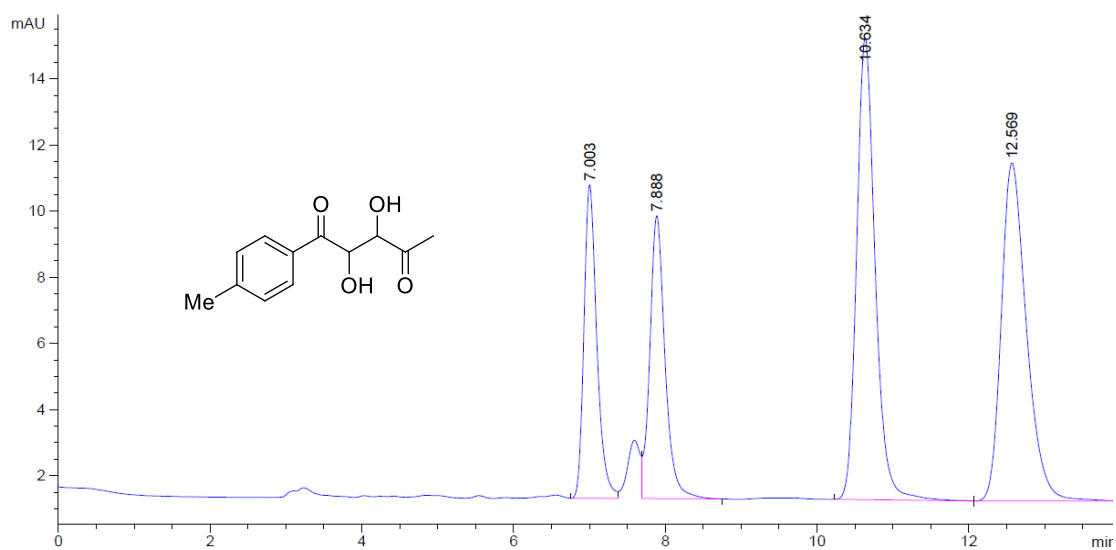
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	18.602	BV	0.4558	9624.17090	315.97885	93.1760
2	20.004	VB	0.9249	704.85004	9.97487	6.8240

YH-1H
Yanghan-20190121-1

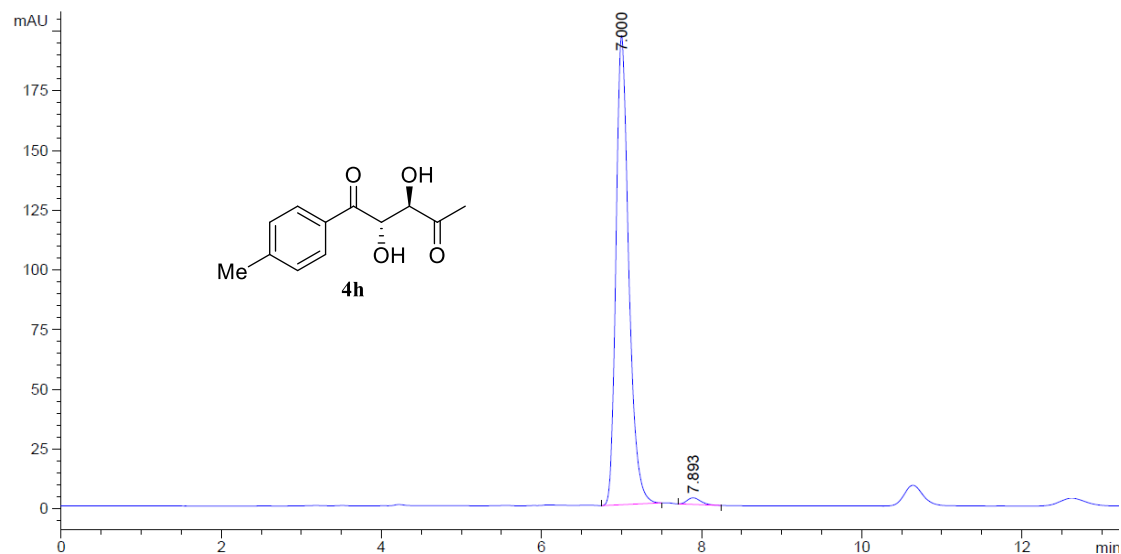


YX-13C
HX-20190121-1



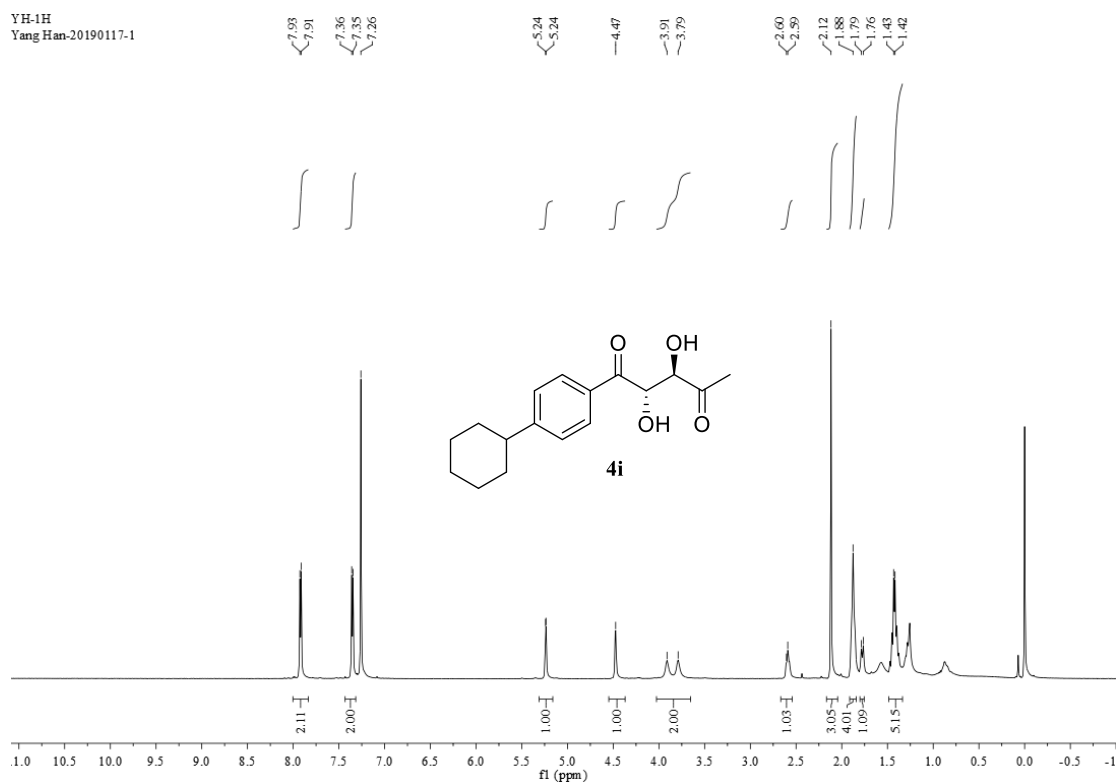


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.003	BV	0.1785	111.91376	9.48060	15.9151
2	7.888	VB	0.2077	119.19920	8.55379	16.9512
3	10.634	BB	0.2595	237.23840	13.95552	33.7374
4	12.569	BBA	0.3496	234.83995	10.22251	33.3963

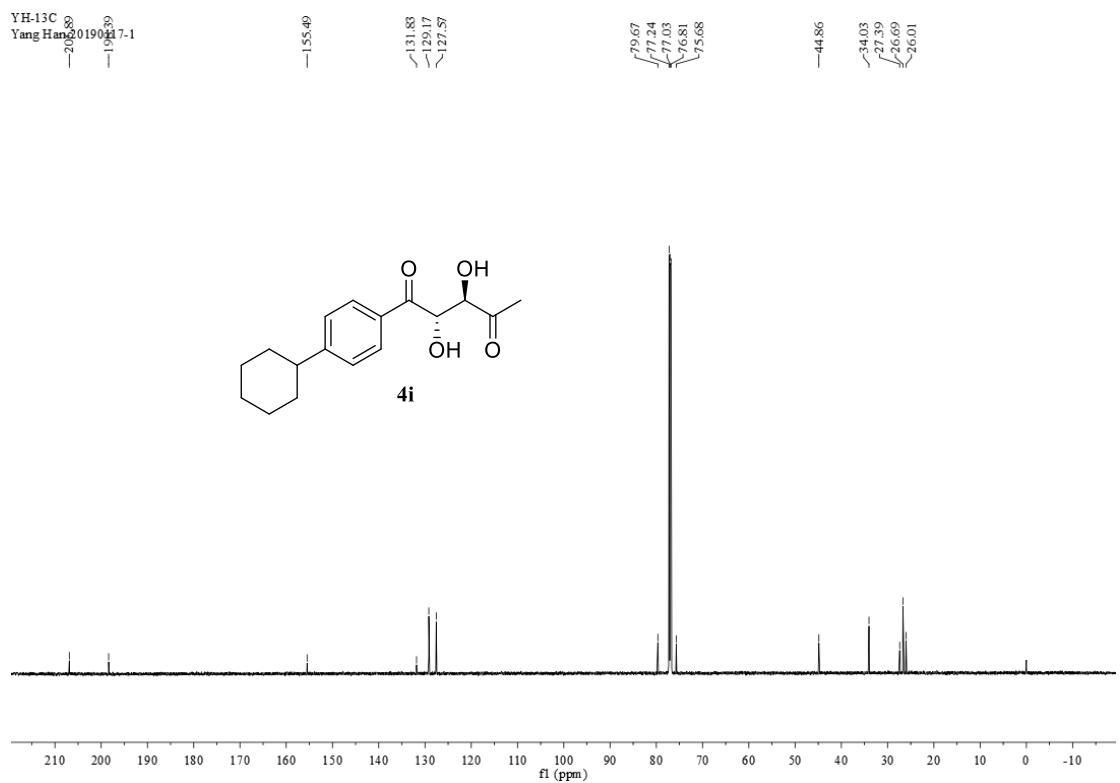


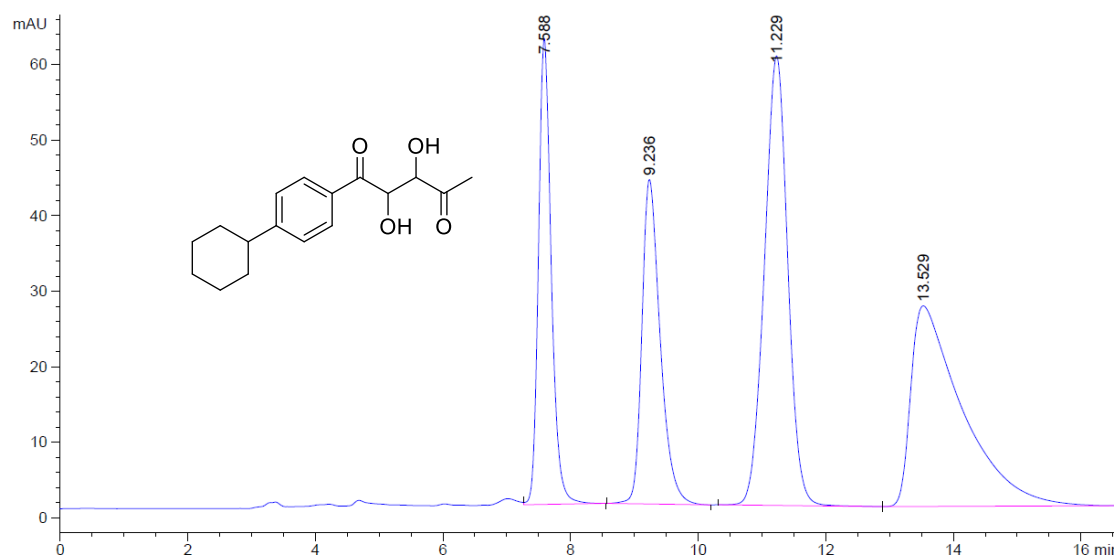
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1	7.000	BB	0.1689	2181.36084	196.41527	98.5299
2	7.893	BB	0.1812	32.54693	2.79137	1.4701

YH-1H
Yang Han-20190117-1

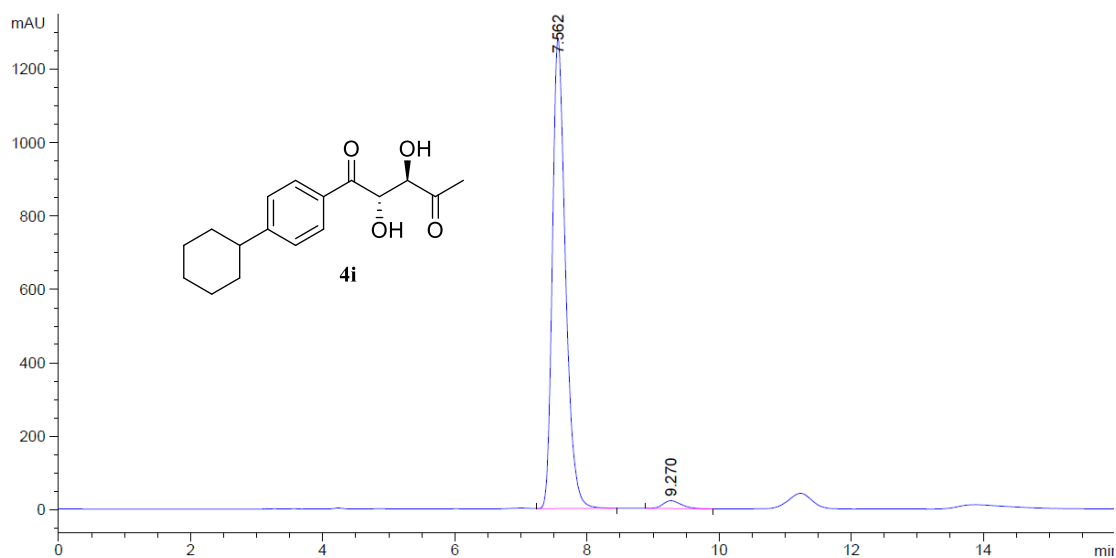


YH-13C
Yang Han-20190117-1



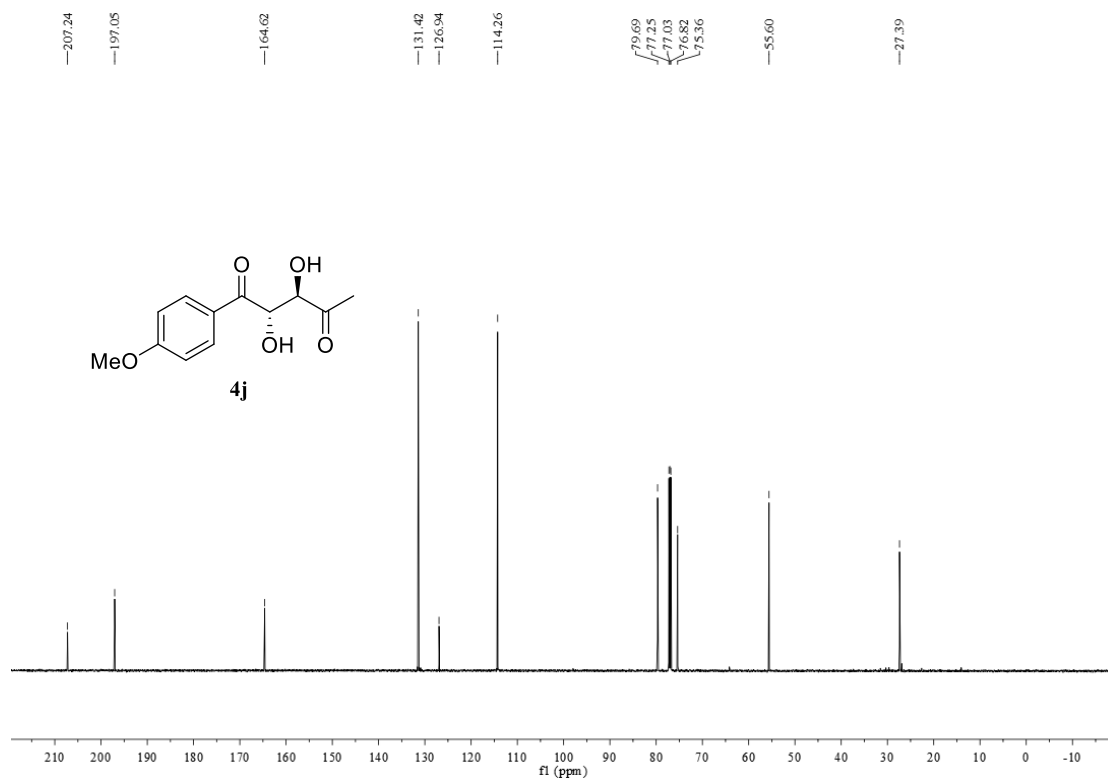
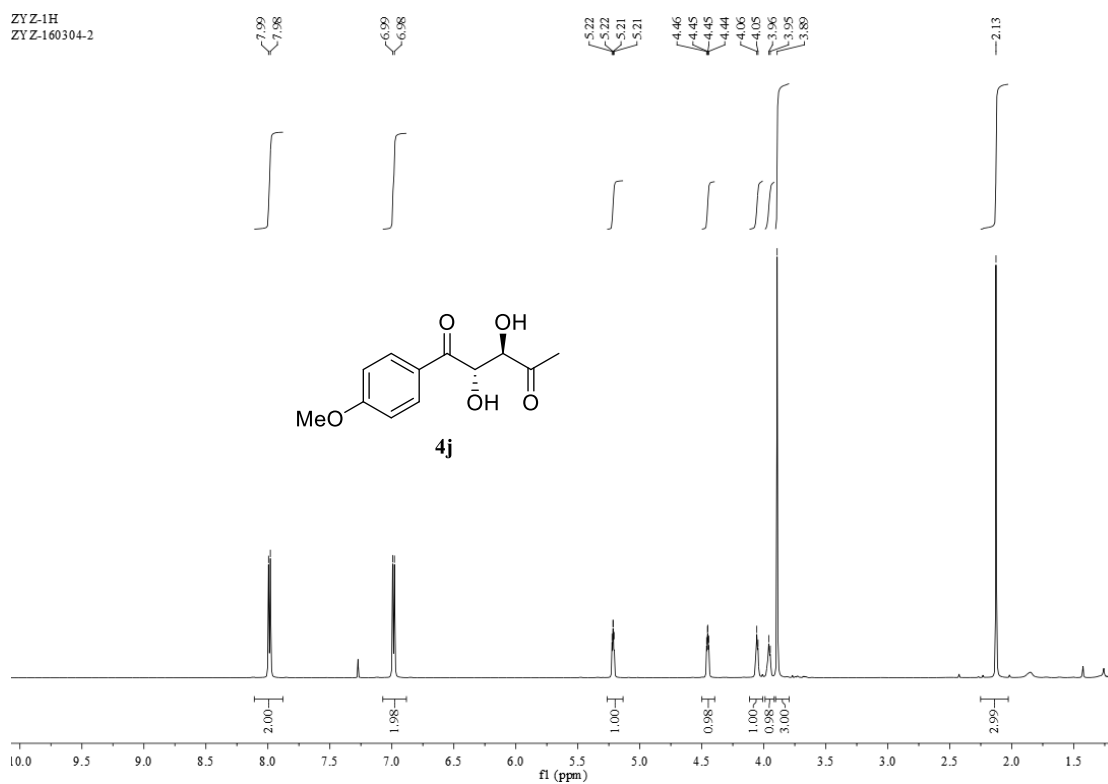


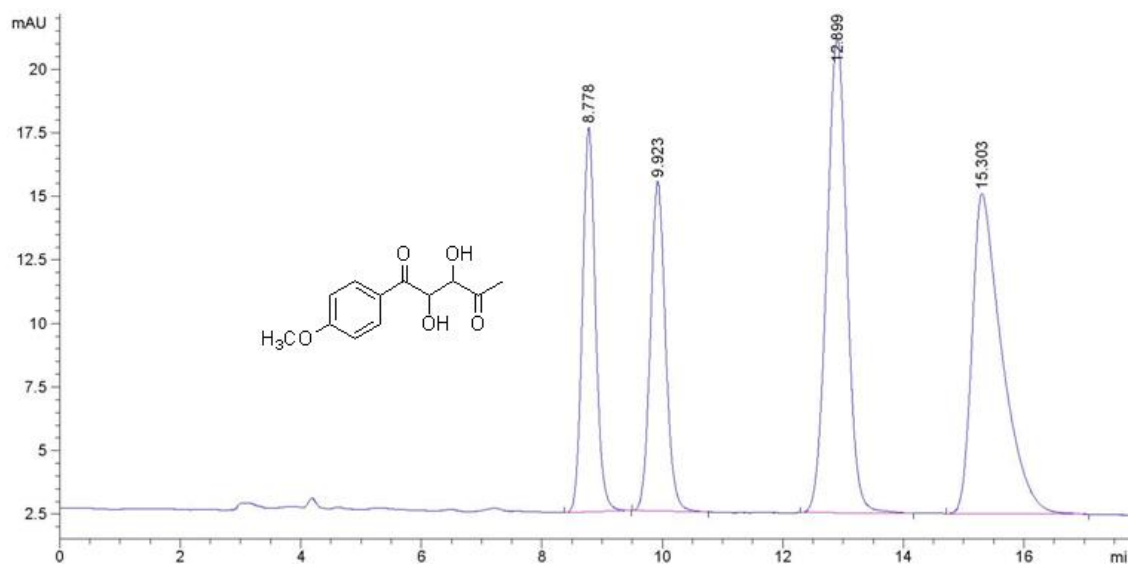
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.588	VB	0.2120	859.44495	61.69501	18.2287
2	9.236	BB	0.3012	857.11310	42.95889	18.1792
3	11.229	BB	0.3868	1512.38696	59.49935	32.0775
4	13.529	BB	0.7897	1485.84473	26.55414	31.5145



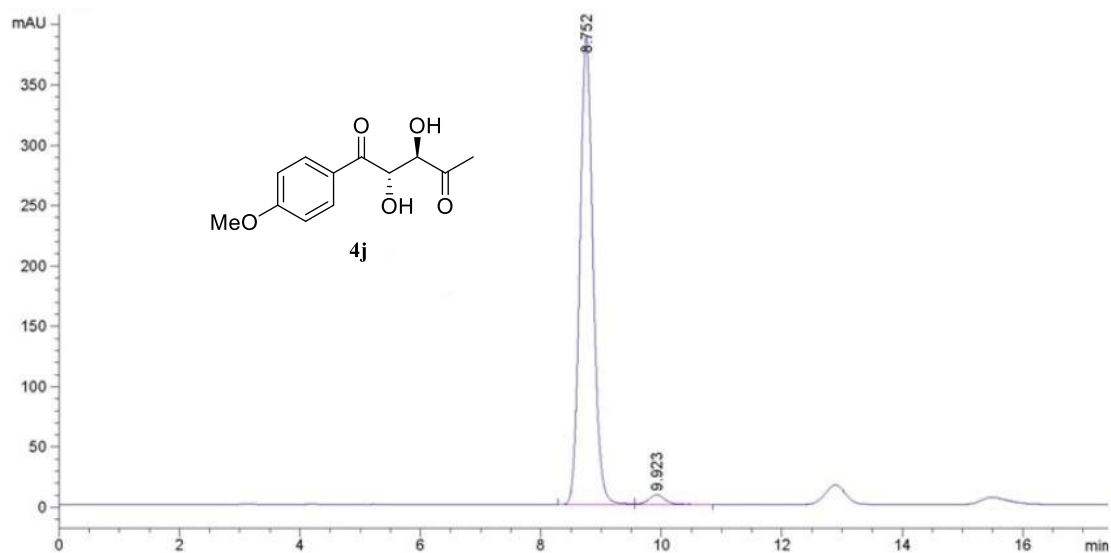
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1	7.562	VB	0.2088	1.76694e4	1282.71814	97.7472
2	9.270	BB	0.2942	407.23624	21.18026	2.2528

ZYZ-1H
ZYZ-160304-2



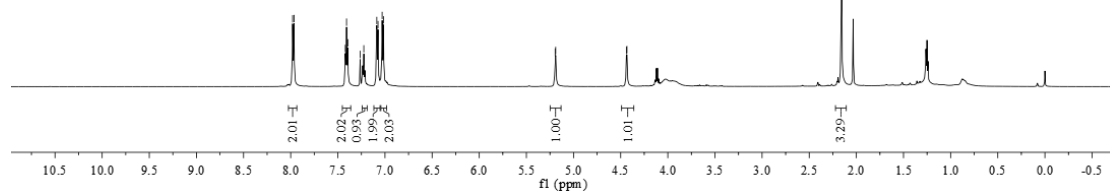
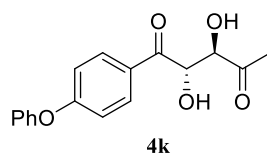
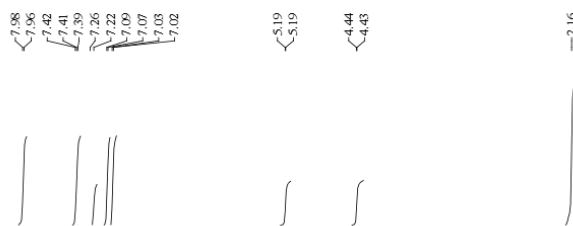


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	8.778	BB	0.2314	228.04756	15.11089	17.3210
2	9.923	BB	0.2668	225.25436	12.95990	17.1088
3	12.899	BB	0.3583	431.55206	18.68399	32.7778
4	15.303	BB	0.4917	431.74481	12.59380	32.7924

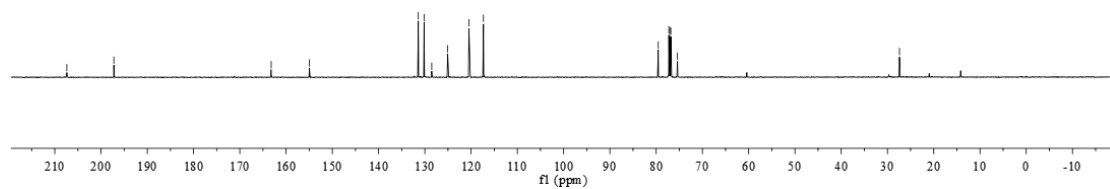
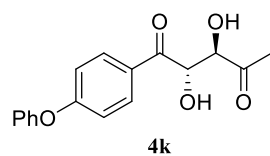


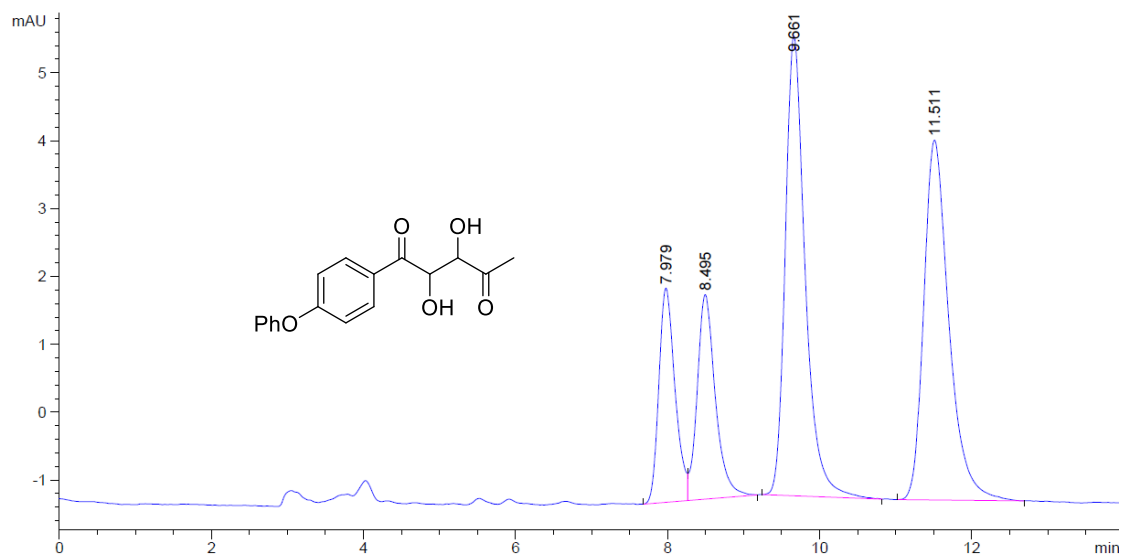
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1	8.752	BV	0.2338	5869.73291	386.87262	97.6031
2	9.923	VB	0.2814	144.14372	7.78839	2.3969

YX-1H
HX-201901-21-2

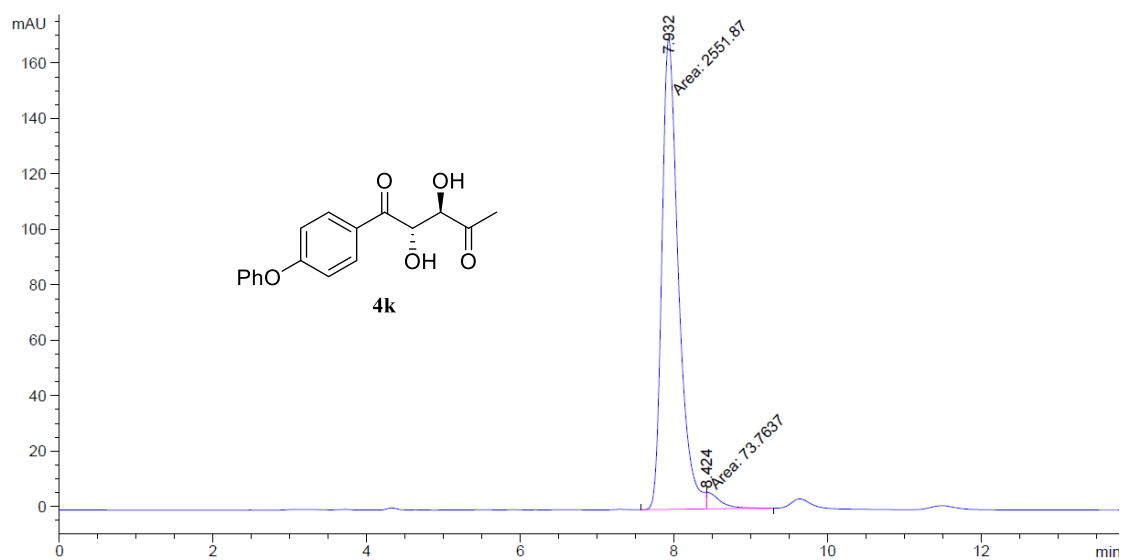


YX-13C
HX-201901-21-2

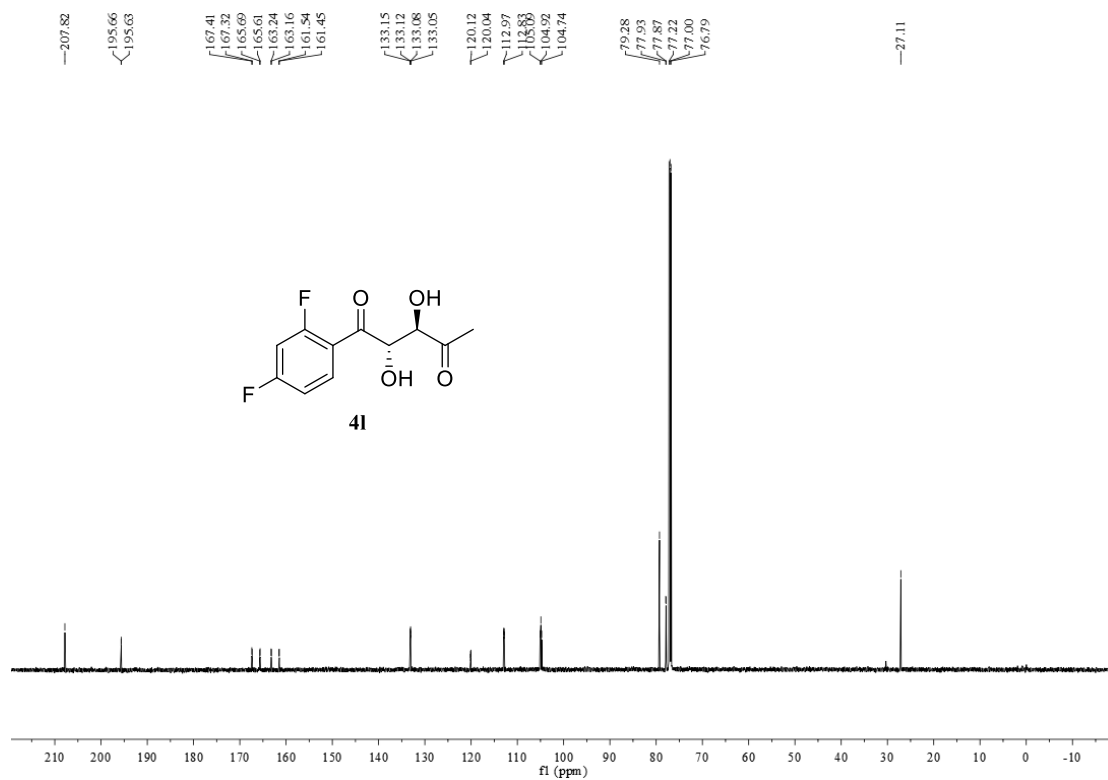
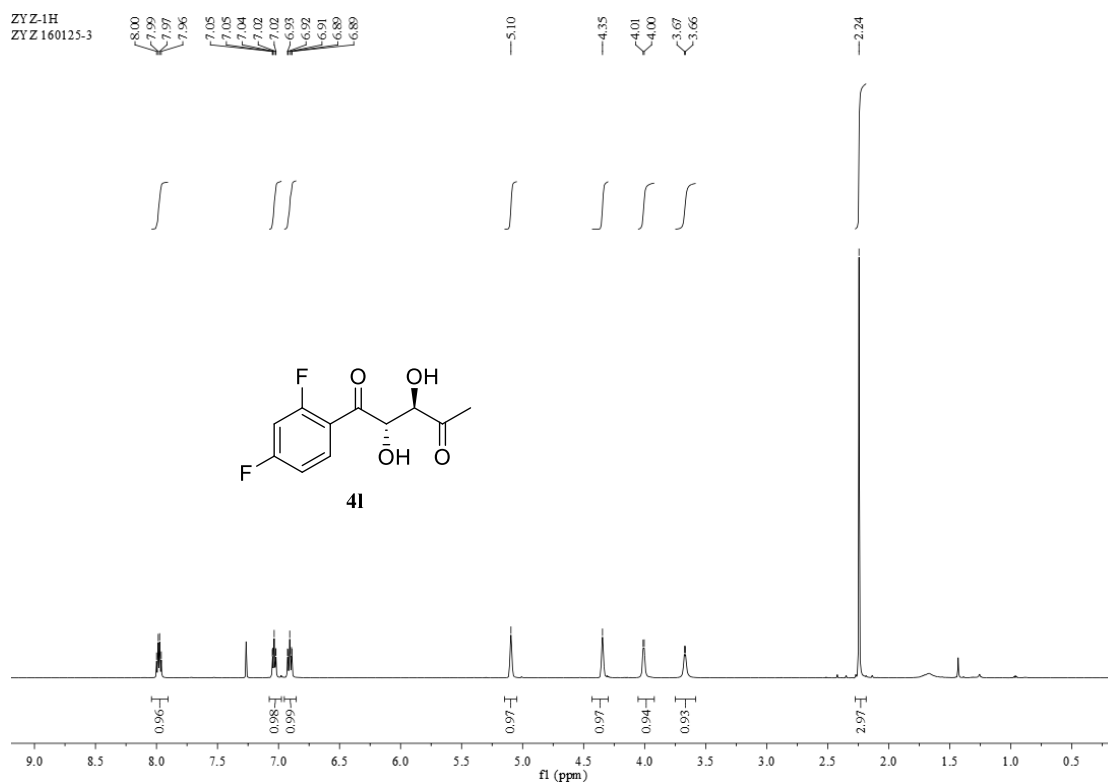


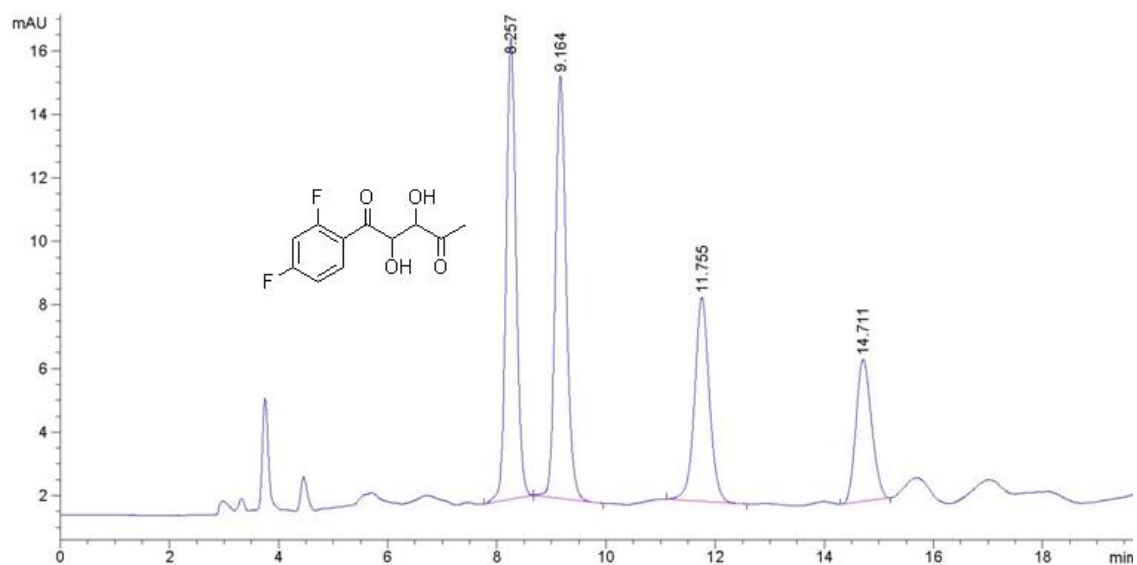


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.979	BV	0.2249	46.66187	3.15618	13.6567
2	8.495	VB	0.2490	49.99683	3.01252	14.6328
3	9.661	BB	0.2735	123.27216	6.77283	36.0786
4	11.511	BB	0.3451	121.74620	5.30158	35.6320

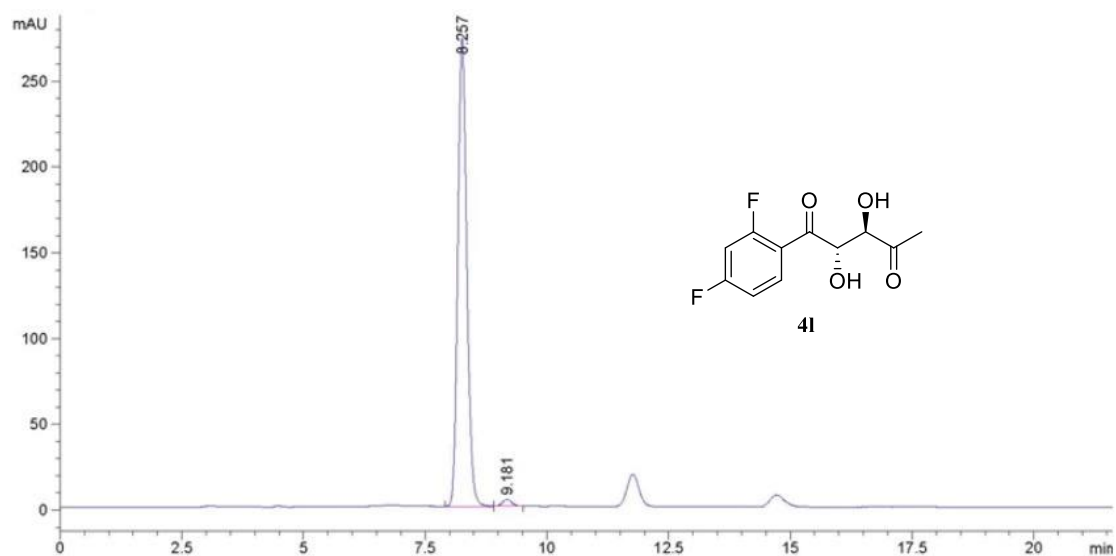


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.932	MF	0.2504	2551.86865	169.84280	97.1906
2	8.424	FM	0.2048	73.76369	6.00317	2.8094

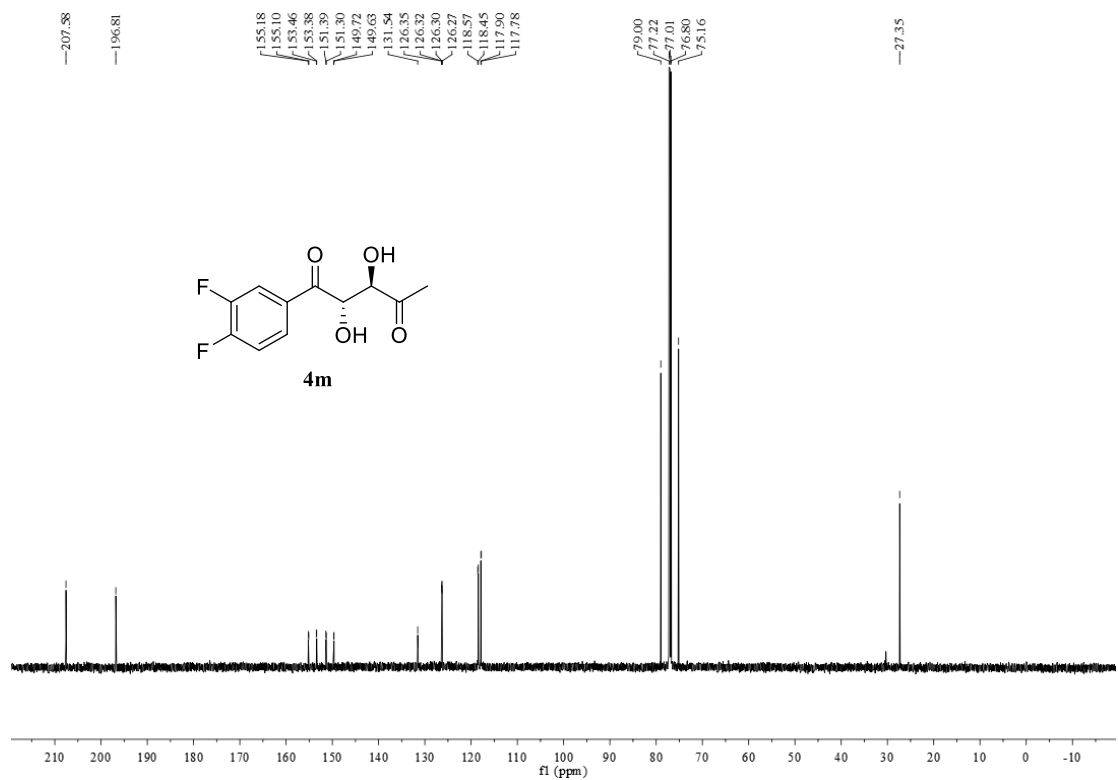


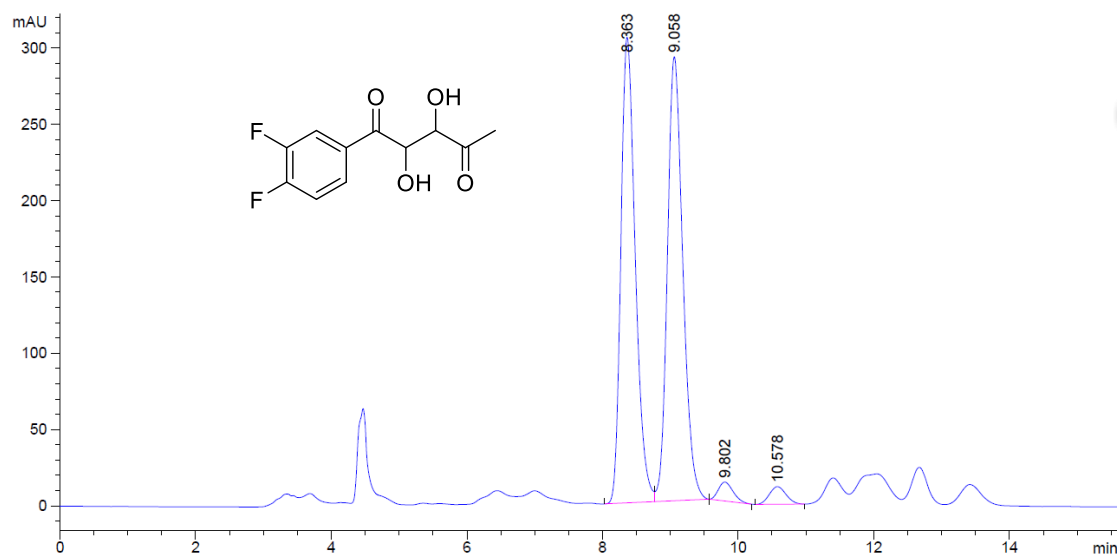


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	8.257	BB	0.1963	184.36545	14.50908	31.9382
2	9.164	BB	0.2131	184.67561	13.28911	31.9920
3	11.755	BB	0.2823	119.87582	6.40900	20.7665
4	14.711	BB	0.3081	88.33936	4.46305	15.3033

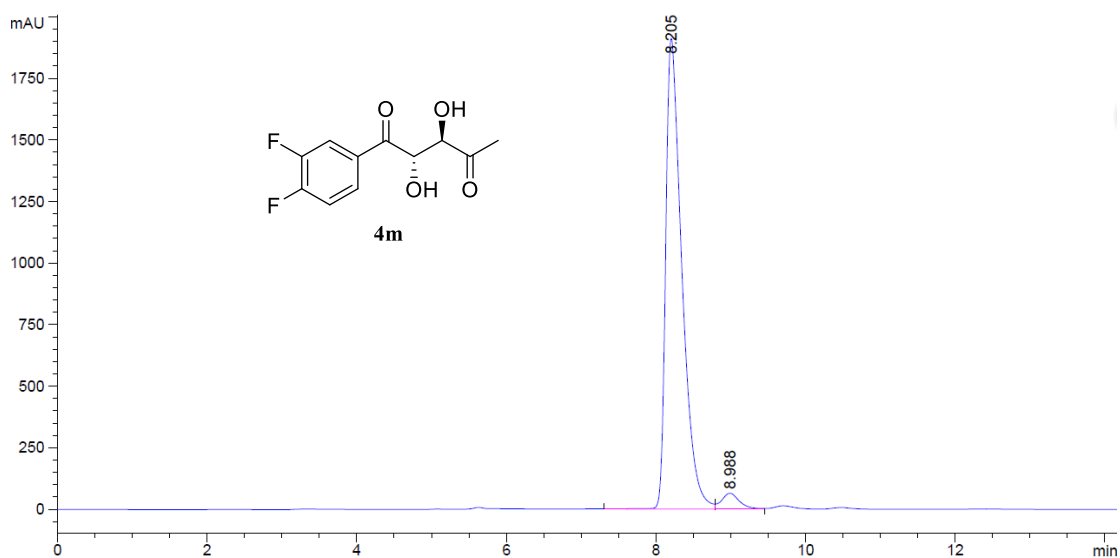


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	8.257	BV	0.1977	3496.92529	272.58347	98.5221
2	9.181	VB	0.2112	52.45619	3.81888	1.4779



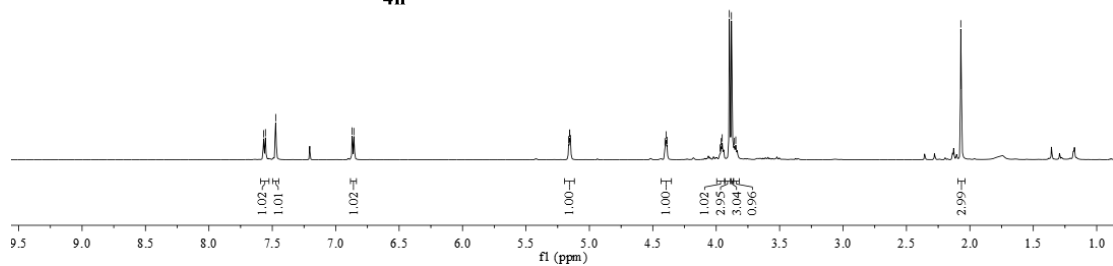
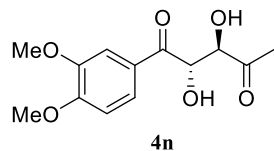


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	8.363	BV	0.2259	4499.51660	305.18317	47.4124
2	9.058	VB	0.2430	4606.69238	291.04071	48.5418
3	9.802	BB	0.2355	186.94438	12.41215	1.9699
4	10.578	BB	0.2663	197.00714	11.53703	2.0759

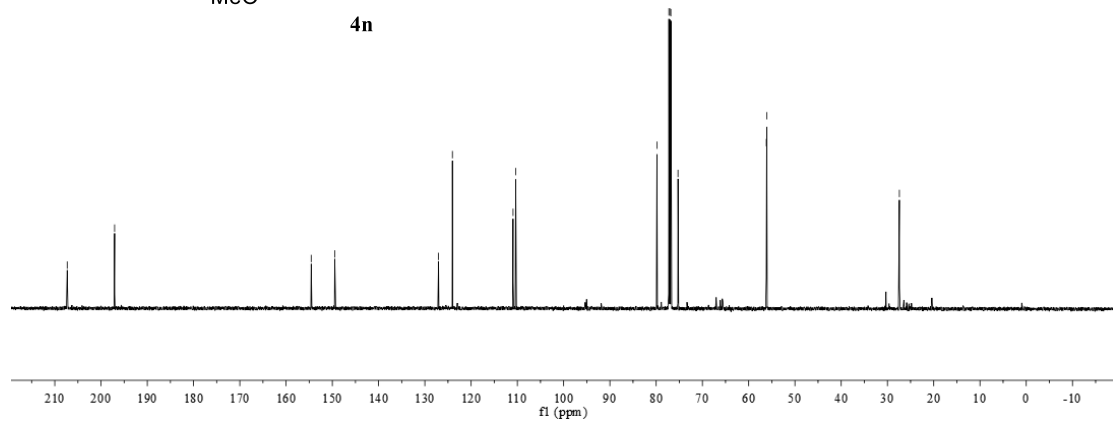
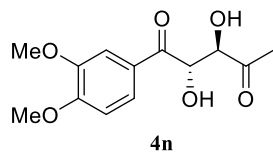


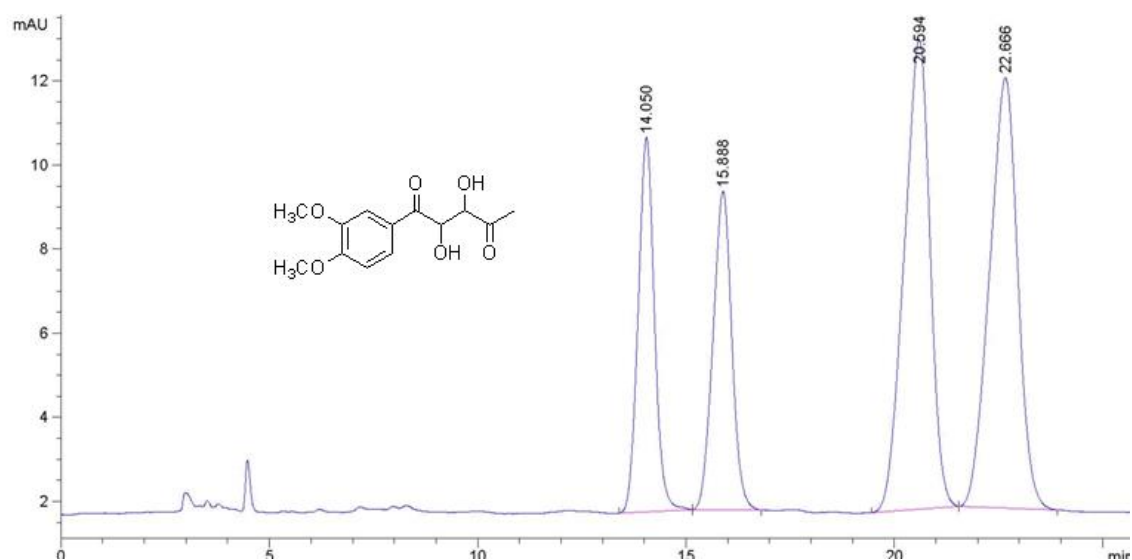
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	8.205	BV	0.2241	2.85949e4	1911.06152	96.4034
2	8.988	VV	0.2481	1066.81079	64.09940	3.5966

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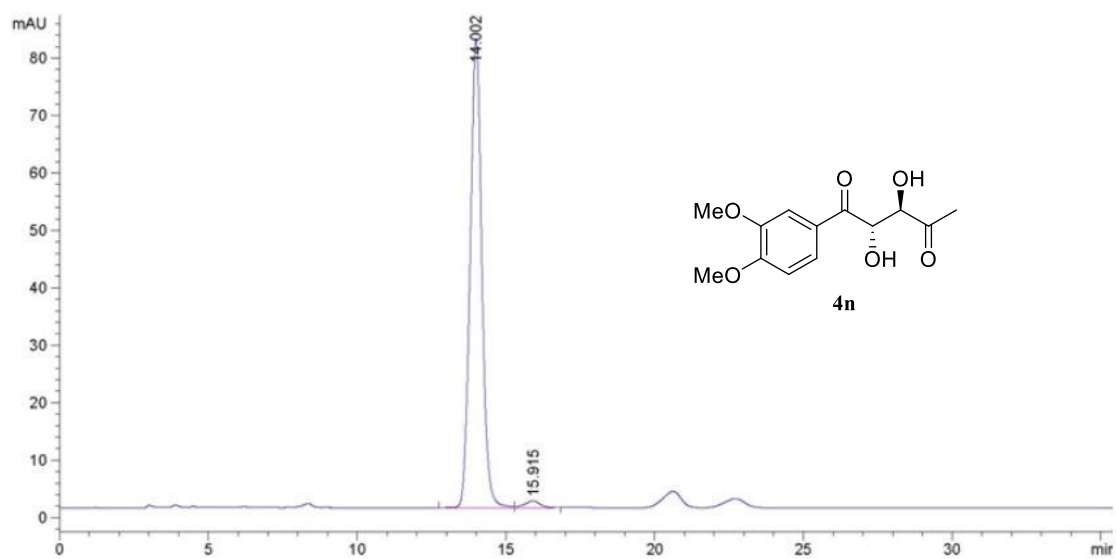


207.31
197.05
154.57
149.48
127.05
124.05
110.93
110.36
79.83
77.25
77.04
76.82
75.28
56.18
56.09
27.42



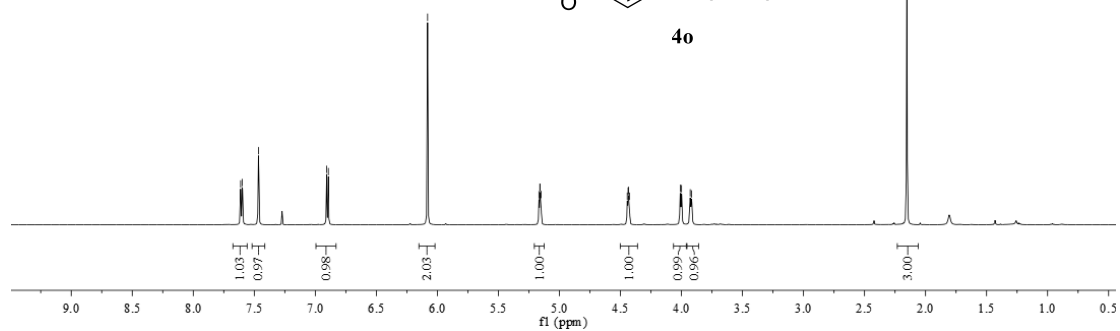
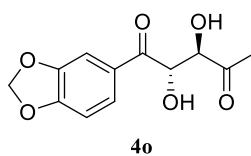


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	14.050	BB	0.4112	241.49118	8.89995	16.7691
2	15.888	BB	0.4780	237.38399	7.56985	16.4839
3	20.594	BB	0.6405	481.05862	11.17663	33.4046
4	22.666	BB	0.6854	480.16418	10.23913	33.3425

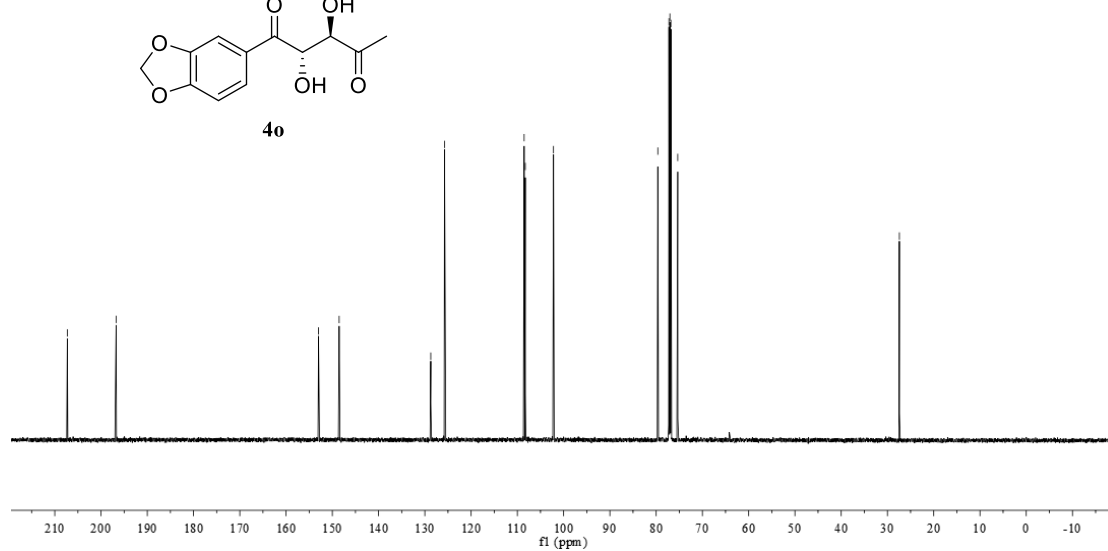
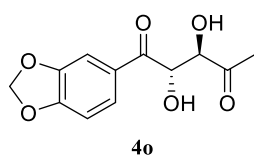


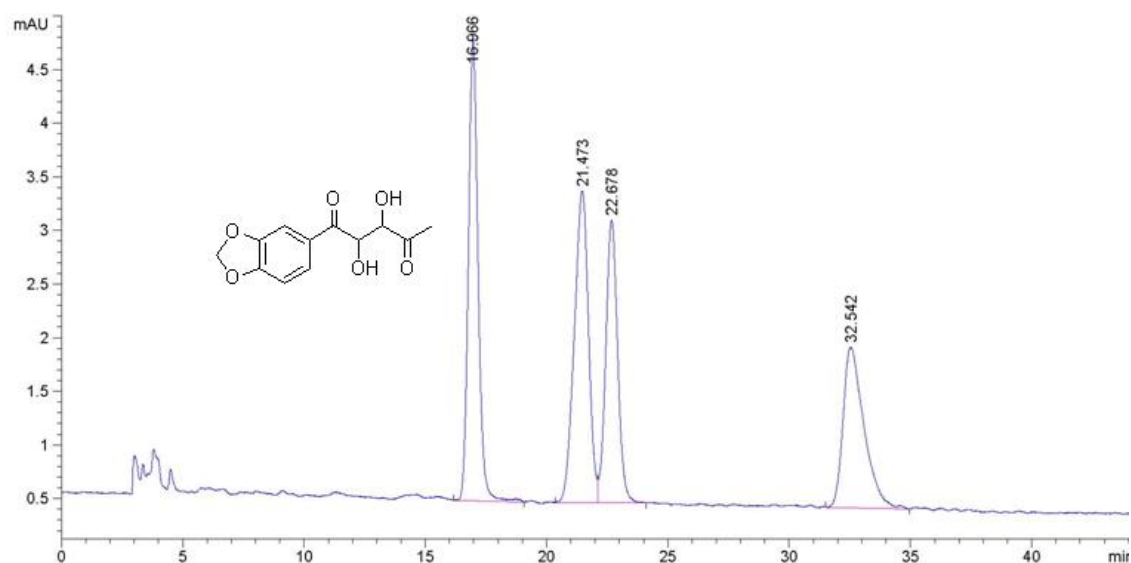
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	14.002	BV	0.4137	2223.37061	81.67034	98.1808
2	15.915	VB	0.5097	41.19763	1.18730	1.8192

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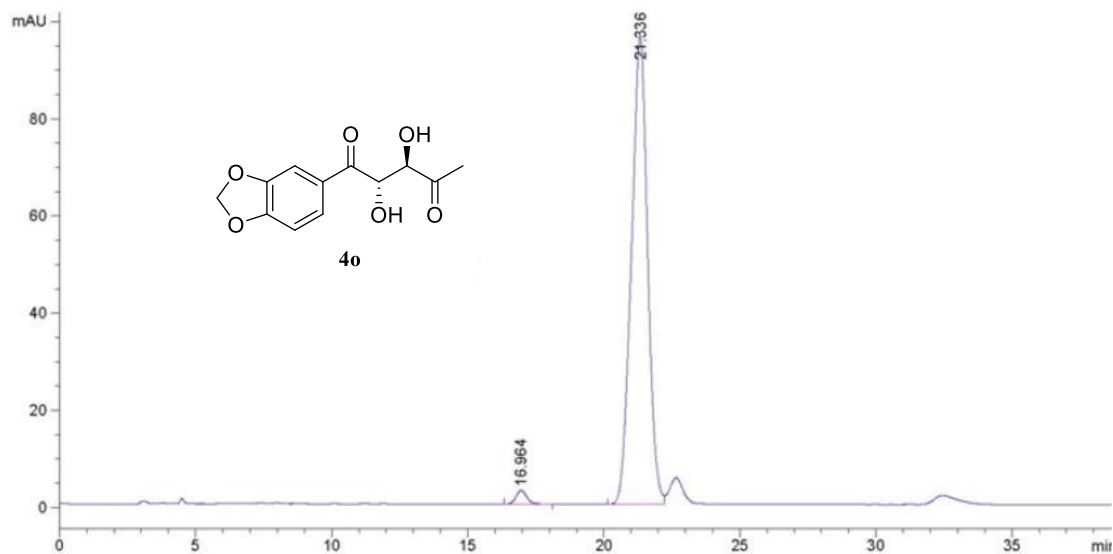


207.28
 196.73
 152.99
 148.52
 128.72
 125.75
 108.53
 108.29
 102.19
 79.64
 77.24
 77.03
 76.82
 75.33
 27.42



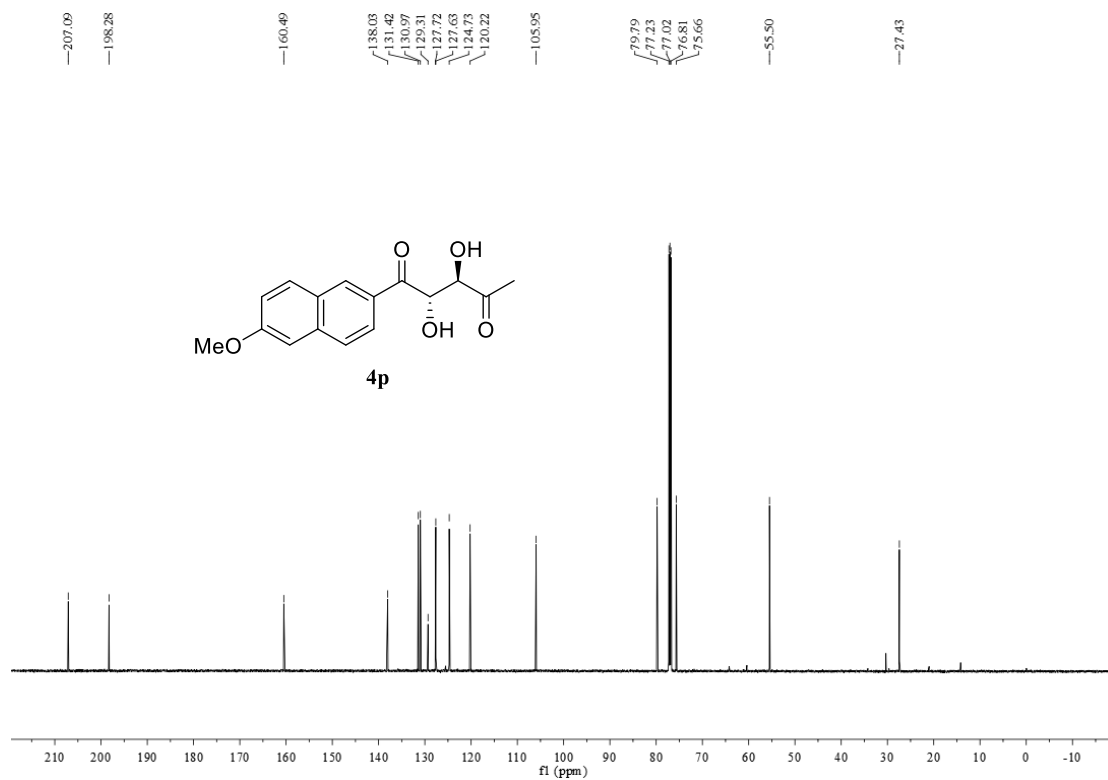
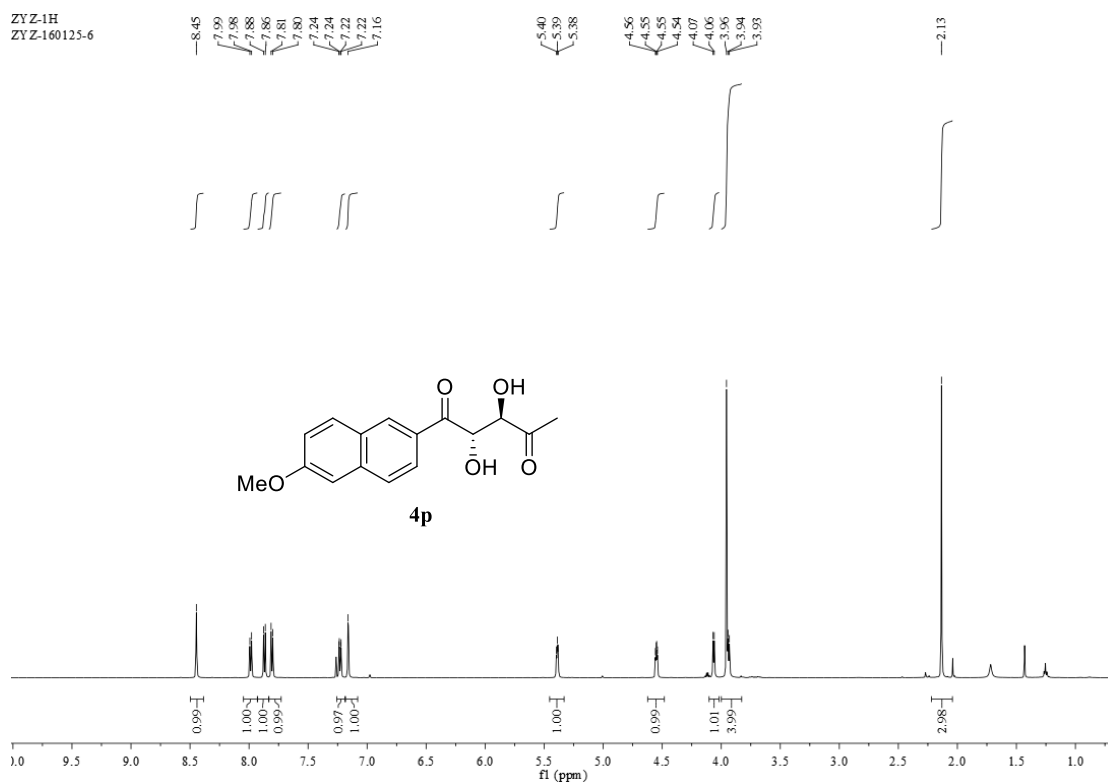


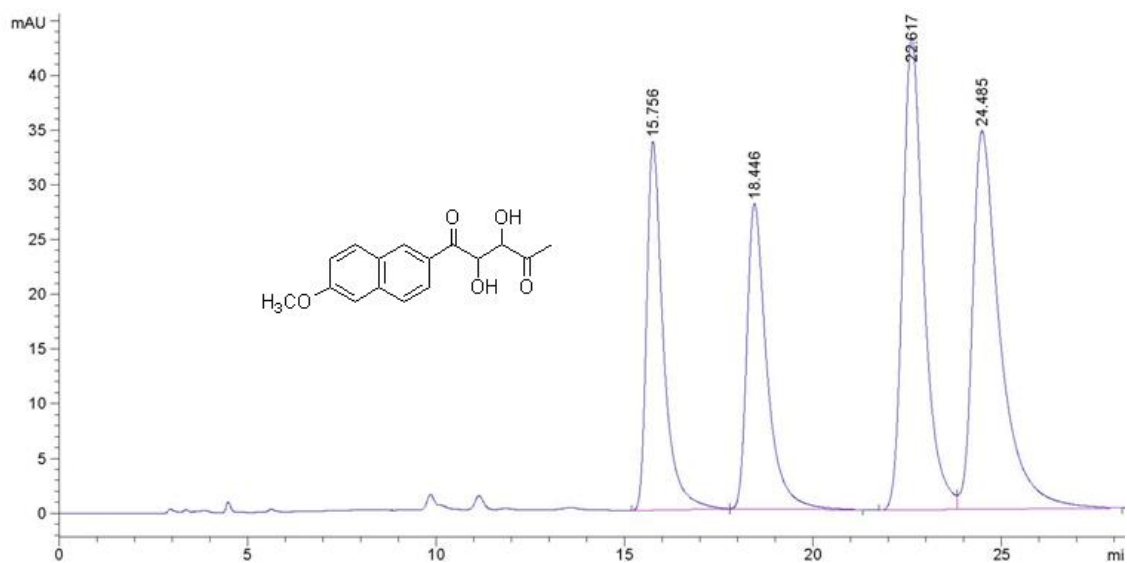
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.966	BB	0.4310	120.22090	4.29997	28.7024
2	21.473	BV	0.6233	119.03335	2.90692	28.4189
3	22.678	VB	0.5309	89.72453	2.63686	21.4215
4	32.542	BB	0.8688	89.87440	1.49802	21.4573



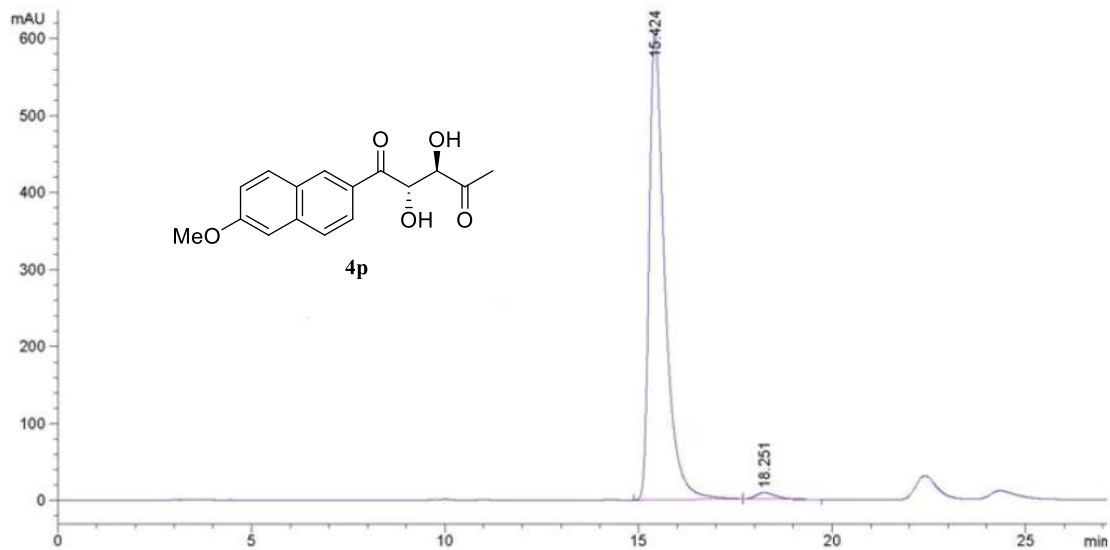
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.964	BB	0.4121	76.99448	2.81670	1.9011
2	21.336	BV	0.6104	3972.93457	96.39190	98.0989

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Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	15.756	BB	0.4560	1035.28479	33.69727	18.8339
2	18.446	BB	0.5452	1025.22119	27.90237	18.6509
3	22.617	BV	0.5869	1679.81372	43.12879	30.5592
4	24.485	VB	0.7423	1756.59265	34.59644	31.9560



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	15.424	BB	0.4154	1.68834e4	605.76044	98.3467
2	18.251	BB	0.5174	283.83081	8.20088	1.6533