Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

Supporting Information

Construction of Chiral Macromolecular Catalyst in Hollow Silica Nanoreactors for Efficient and Recyclable Asymmetric Catalysis

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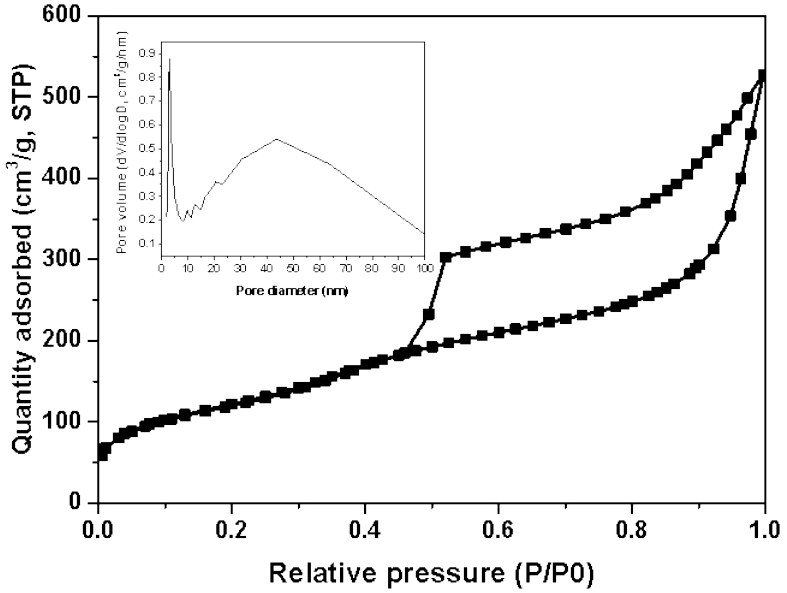


Fig. S1. N_2 sorption isotherms and pore size distribution of the solid catalyst after recycling

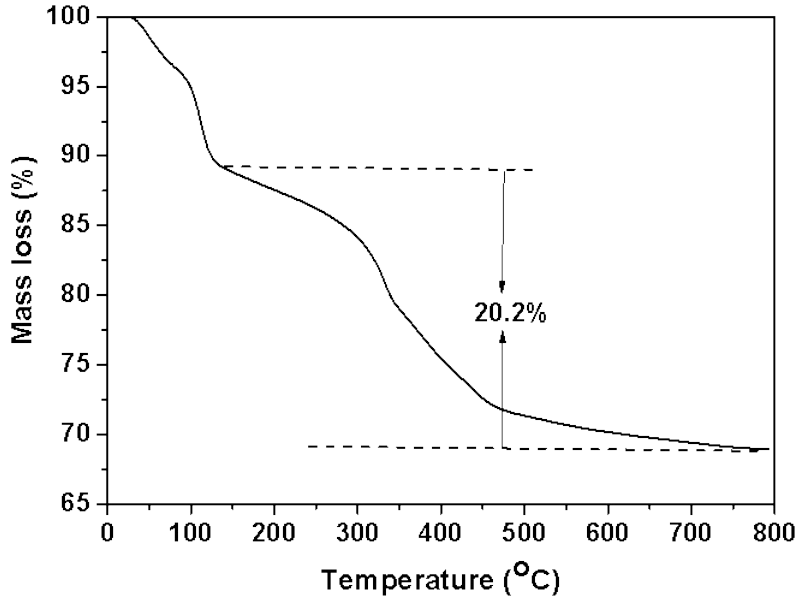


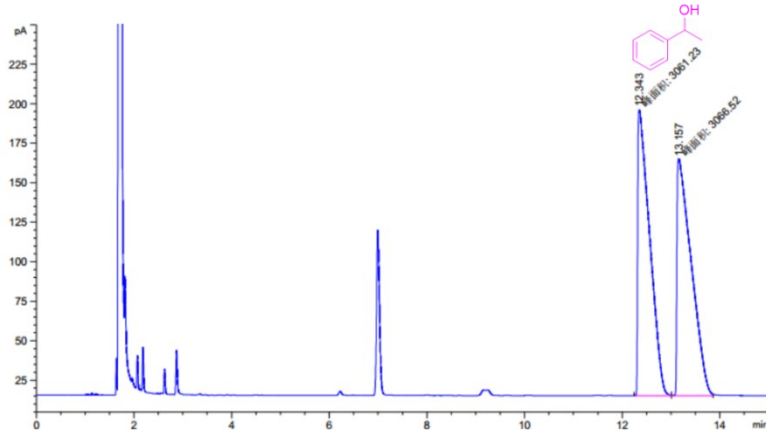
Fig. S2. TGA curve of the solid catalyst after recycling

The GC traces of asymmetric transfer hydrogenation reactions of various aromatic ketones [The catalytic activity and enantiomeric excess were determined by chiral GC using Cyclodex-B chiral column]

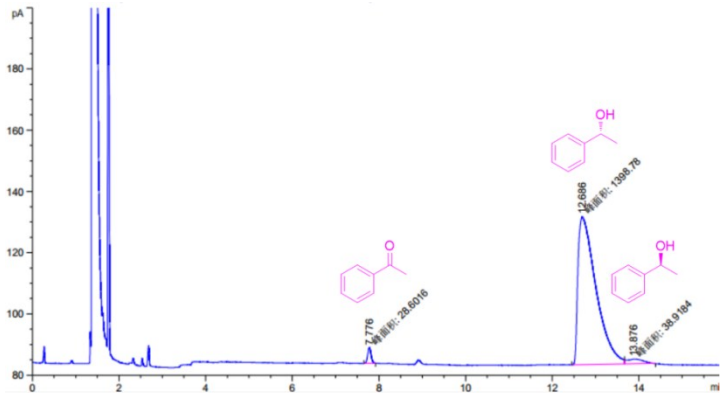
Translation of Chinese to English is as follows:

Peak	Retention time/min		Width	Area	Heigh	Ratios of area
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [pA*s]	峰高 [pA]	峰面积 %
1	12.343	MF	0.2822	3071.65625	181.39662	49.90774
2	13.157	FM	0.3422	3083.01343	150.13686	50.09226

Asymmetric transfer hydrogenation of acetophenone [Column temperature 100 °C, N_2 as carrier gas]

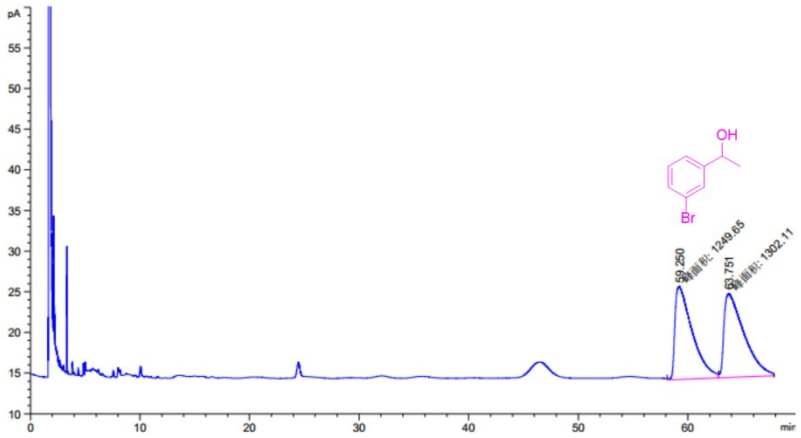


峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [pA*s]	峰高 [pA]	峰面积 %
1	12.343	MF	0.2816	3061.22778	181.18829	49.95683
2	13.157	FM	0.3409	3066.51904	149.92851	50.04317

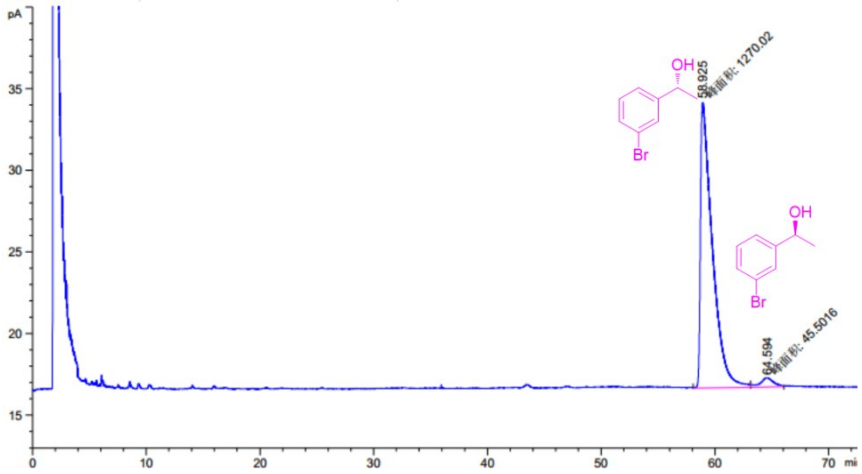


峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [pA*s]	峰高 [pA]	峰面积 %
1	7.776	MM	0.0920	28.60157	5.17933	1.95059
2	12.686	MF	0.4813	1398.78064	48.43420	95.39522
3	13.876	FM	0.4261	38.91840	1.52242	2.65419

Asymmetric transfer hydrogenation of 3'-bromoacetophenone [Column temperature 120 °C]

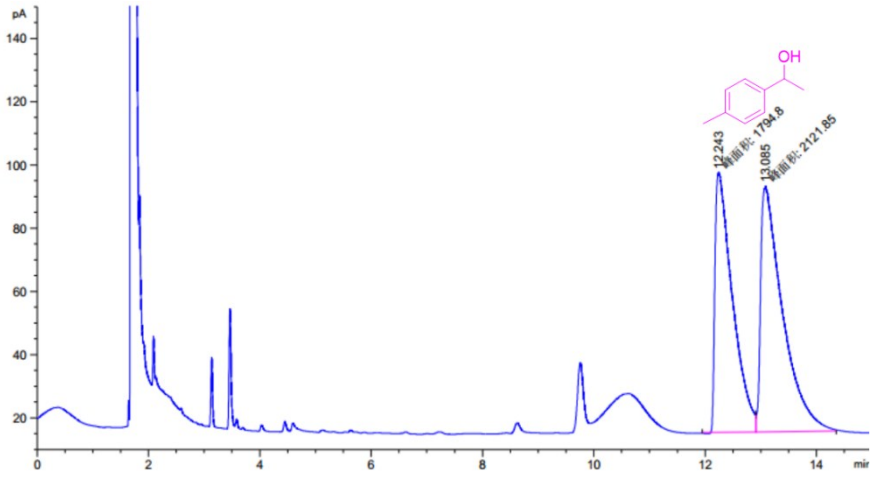


峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [pA*s]	峰高 [pA]	峰面积 %
1	59.250	MF	1.8099	1249.64722	11.50764	48.97206
2	63.751	FM	2.0986	1302.10815	10.34100	51.02794

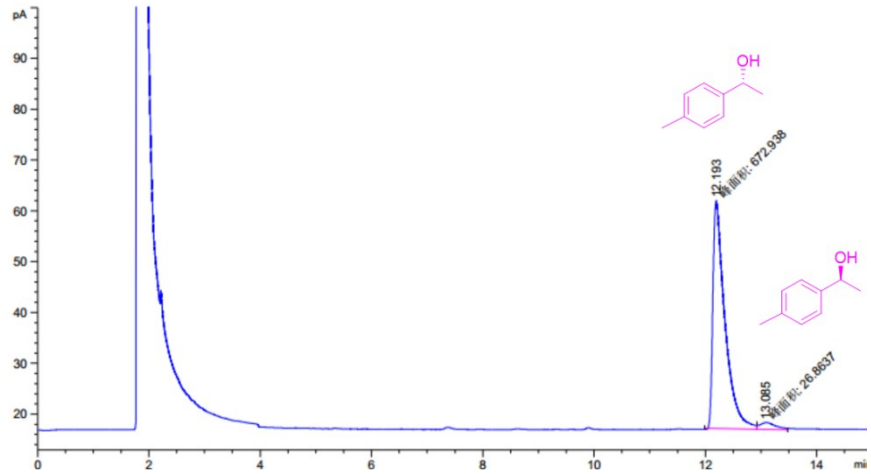


峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [pA*s]	峰高 [pA]	峰面积 %
1	58.925	MF	1.2084	1270.01782	17.51647	96.54117
2	64.594	FM	1.3533	45.50159	5.60365e-1	3.45883

Asymmetric transfer hydrogenation of 4-methylacetophenone [Column temperature 125 °C]

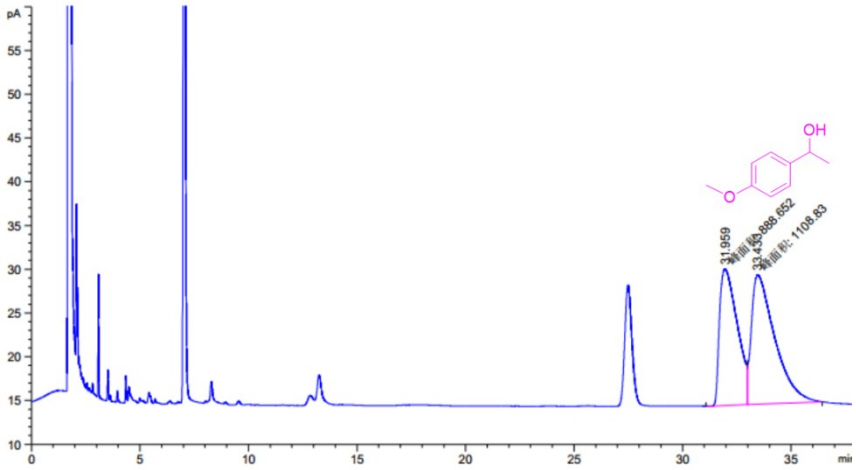


峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [pA*s]	峰高 [pA]	峰面积 %
1	12.243	MF	0.3637	1794.80115	82.23737	45.82486
2	13.085	FM	0.4544	2121.85254	77.82244	54.17514

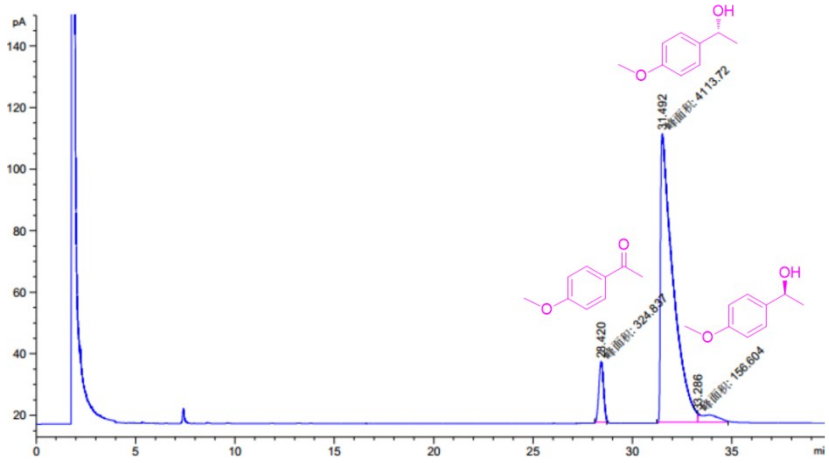


峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [pA*s]	峰高 [pA]	峰面积 %
1	12.193	MF	0.2501	672.93811	44.83894	96.16124
2	13.085	FM	0.3343	26.86374	1.33918	3.83876

Asymmetric transfer hydrogenation of 4-methoxylacetophenone [Column temperature 125 °C]

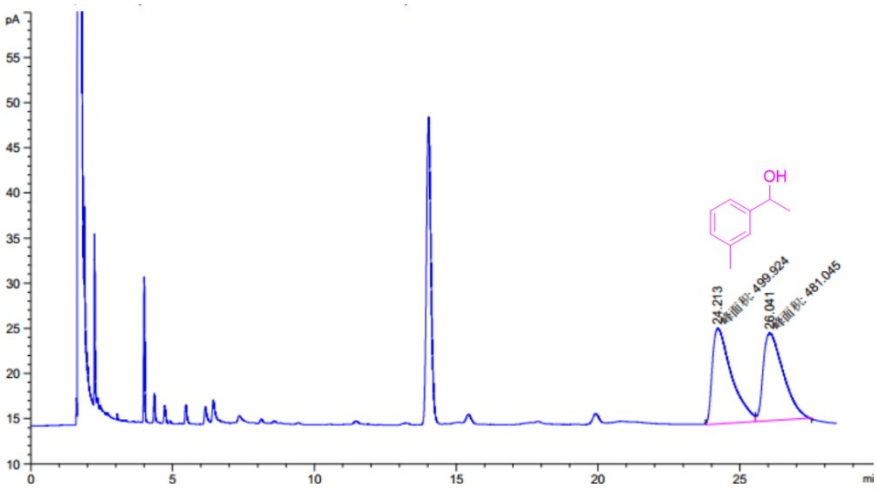


峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [pA*s]	峰高 [pA]	峰面积 %
1	31.959	MF	0.9446	888.65192	15.67887	44.48871
2	33.433	FM	1.2447	1108.82544	14.84744	55.51129

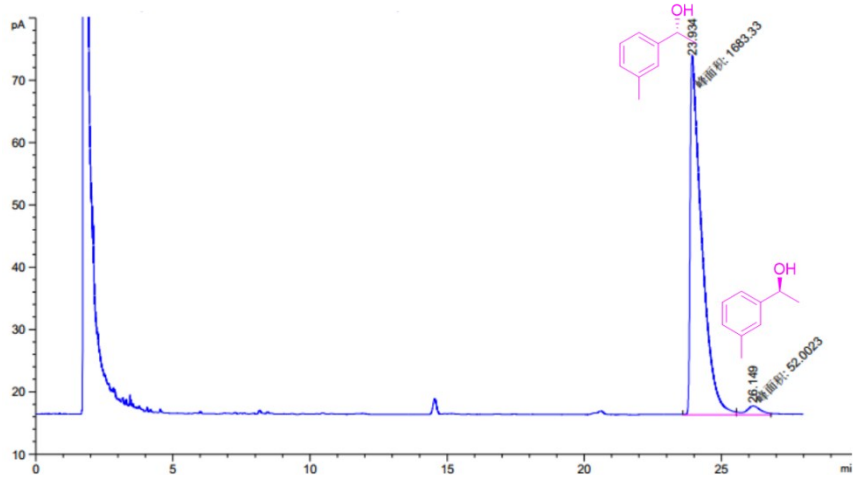


峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [pA*s]	峰高 [pA]	峰面积 %
1	28.420	MM	0.2745	324.83743	19.72523	7.06913
2	31.492	MF	0.7305	4113.71631	93.85266	89.52286
3	33.286	FM	0.9389	156.60365	2.78001	3.40801

Asymmetric transfer hydrogenation of 3-methylacetophenone [Column temperature 110 °C]

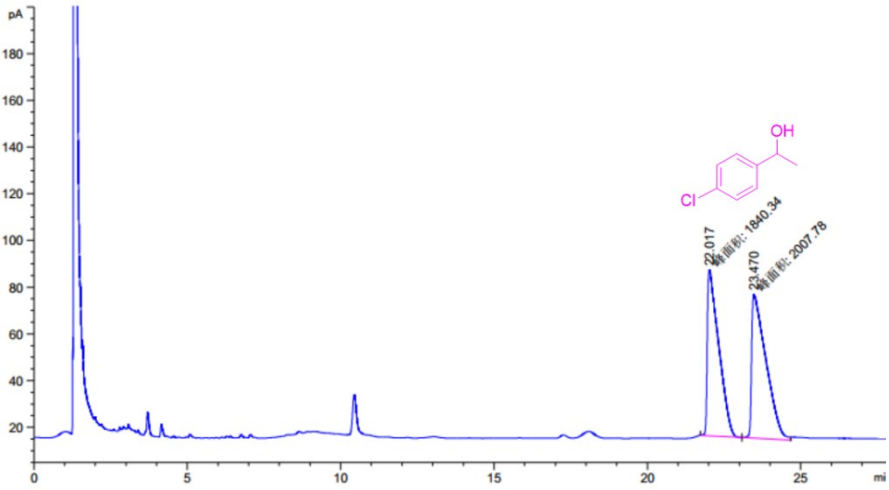


峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [pA*s]	峰高 [pA]	峰面积 %
1	24.213	MF	0.7844	499.92377	10.62259	50.96224
2	26.041	FM	0.8213	481.04523	9.76133	49.03776

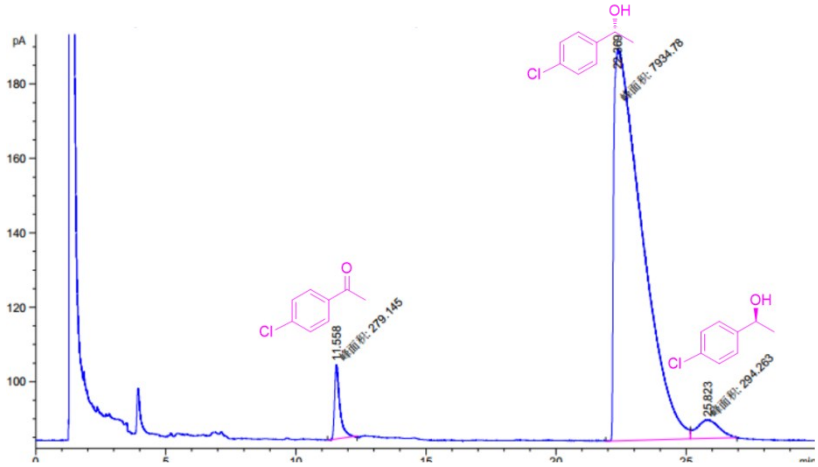


峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [pA*s]	峰高 [pA]	峰面积 %
1	23.934	MF	0.4864	1683.33435	57.68115	97.00333
2	26.149	FM	0.6186	52.00229	1.40106	2.99667

Asymmetric transfer hydrogenation of 4-chloroacetophenone [Column temperature 115 °C]

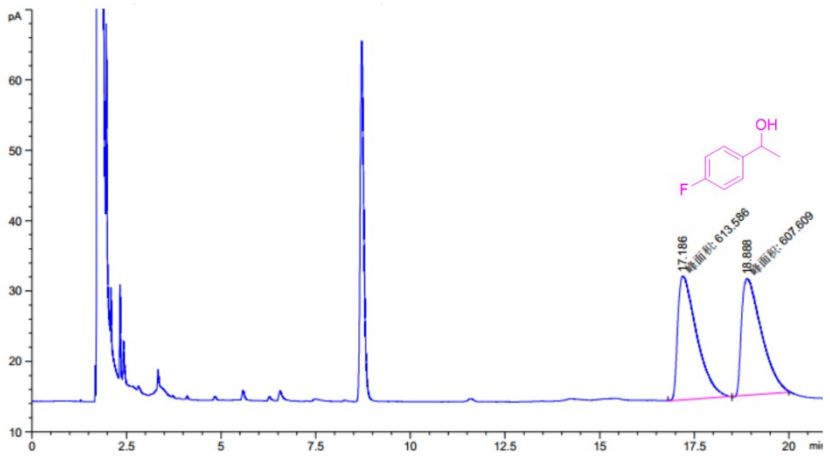


峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [pA*s]	峰高 [pA]	峰面积 %
1	22.017	MF	0.4305	1840.33728	71.24197	47.82440
2	23.470	FM	0.5412	2007.77612	61.82967	52.17560

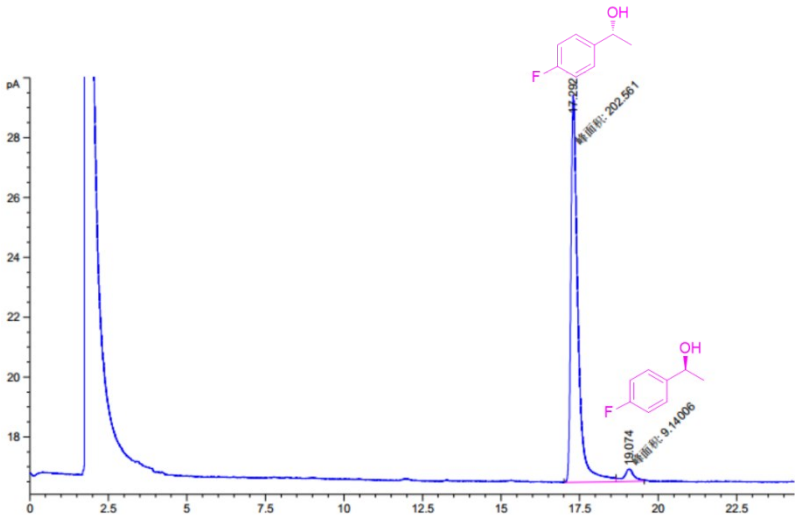


峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [pA*s]	峰高 [pA]	峰面积 %
1	11.558	MM	0.2319	279.14465	20.06267	3.28090
2	22.369	MF	1.2533	7934.77734	105.52209	93.26052
3	25.823	FM	0.9900	294.26315	4.95379	3.45859

Asymmetric transfer hydrogenation of 4-fluoroacetophenone [Column temperature 110 °C]

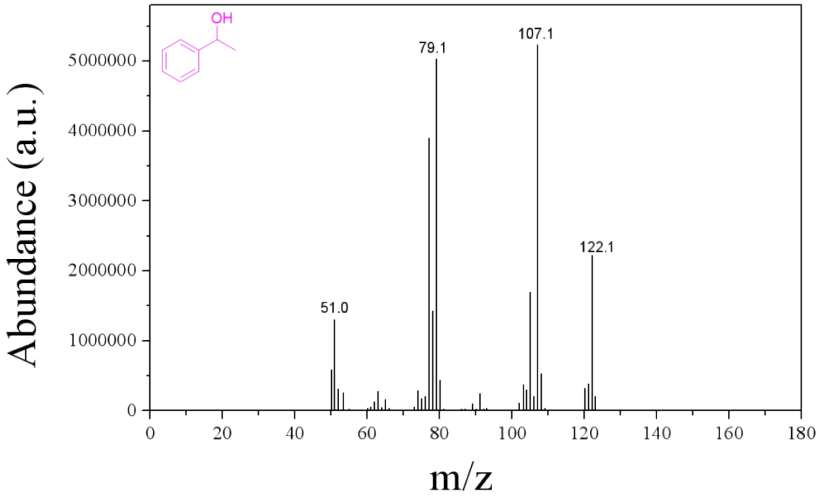


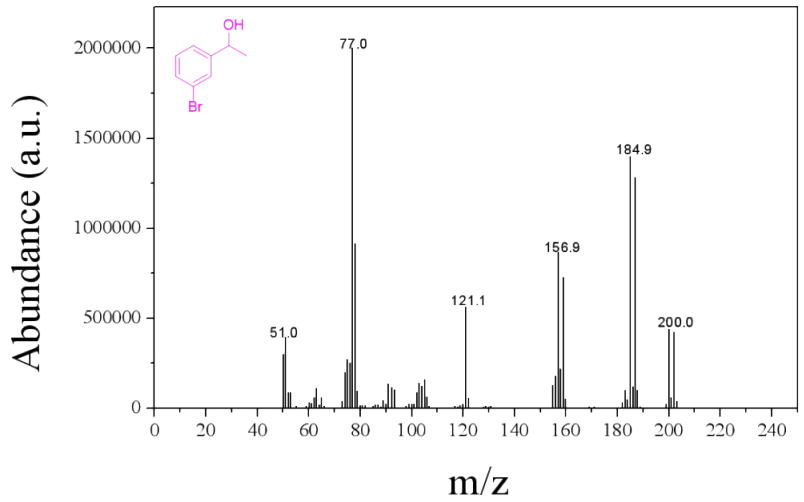
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [pA*s]	峰高 [pA]	峰面积 %
1	17.186	MF	0.5790	613.58618	17.66339	50.24472
2	18.888	FM	0.6088	607.60913	16.63438	49.75528

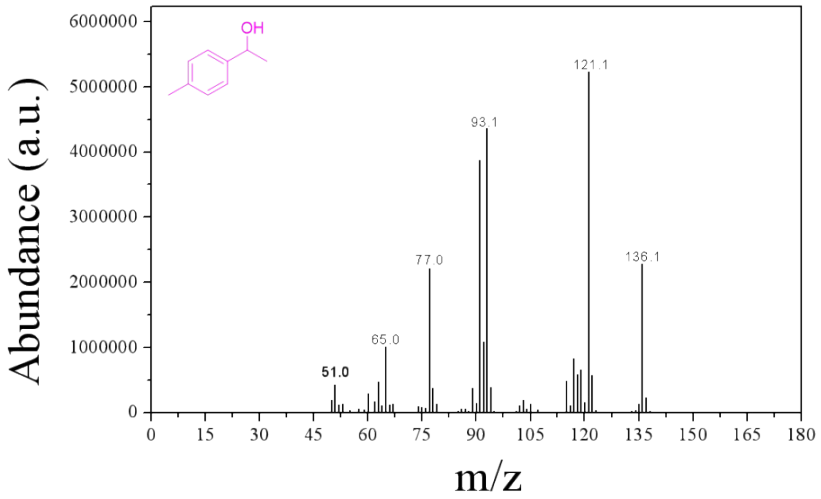


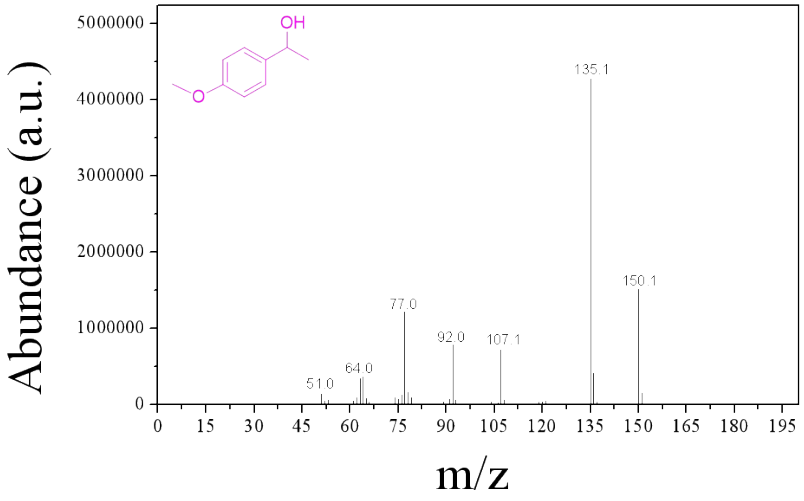
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [pA*s]	峰高 [pA]	峰面积 %
1	17.292	MF	0.2609	202.56088	12.93872	95.68256
2	19.074	FM	0.3610	9.14006	4.21957e-1	4.31744

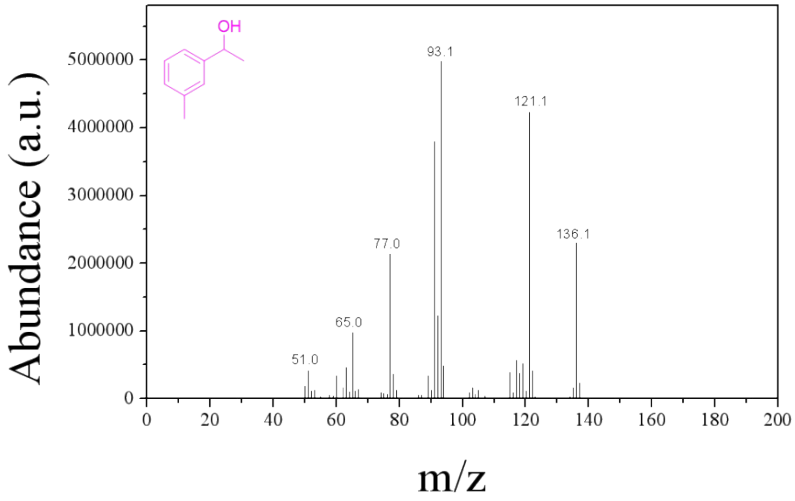
Mass spectrometry spectra

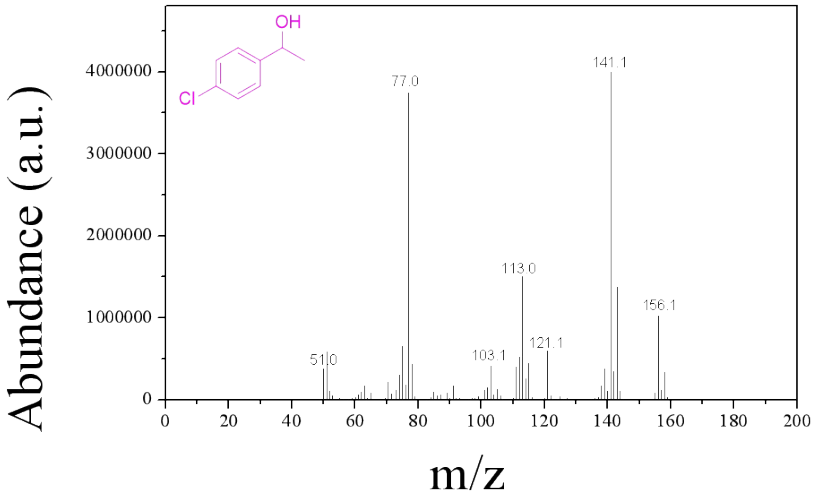


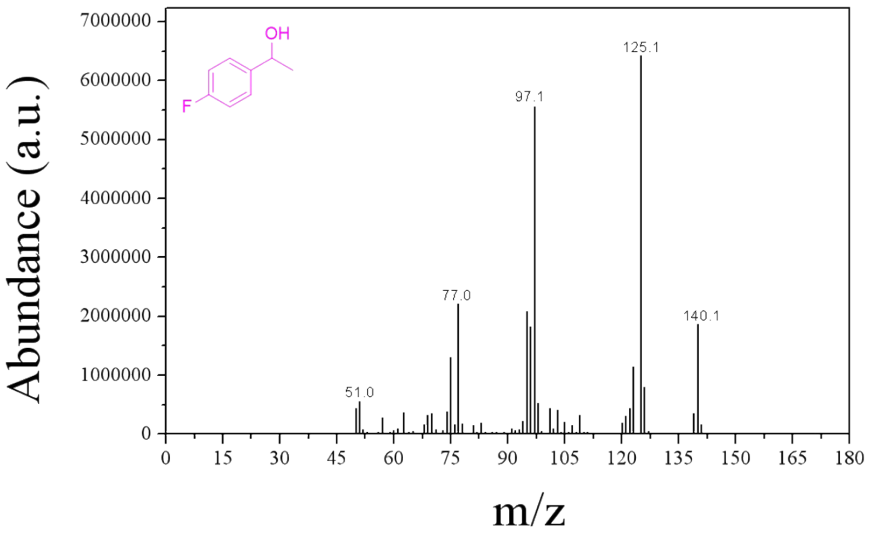





OH
O
135.1
150.1
77.0
92.0
107.1
64.0
51.0
Abundance (a.u.)
m/z


OH
93.1
121.1
136.1
77.0
65.0
51.0
Abundance (a.u.)
m/z


OH
Cl
141.1
77.0
113.0
156.1
121.1
103.1
51.0
Abundance (a.u.)
m/z


Abundance (a.u.)
7000000
6000000
5000000
4000000
3000000
2000000
1000000
0
0
15
30
45
60
75
90
105
120
135
150
165
180
m/z
OH
F
125.1
97.1
77.0
140.1
51.0