

Simple Chiral Sulfonamide Primary Amine Catalysed Highly Enantioselective Michael Addition of Malonates to Enones

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Beijing 100081, People's Republic of China

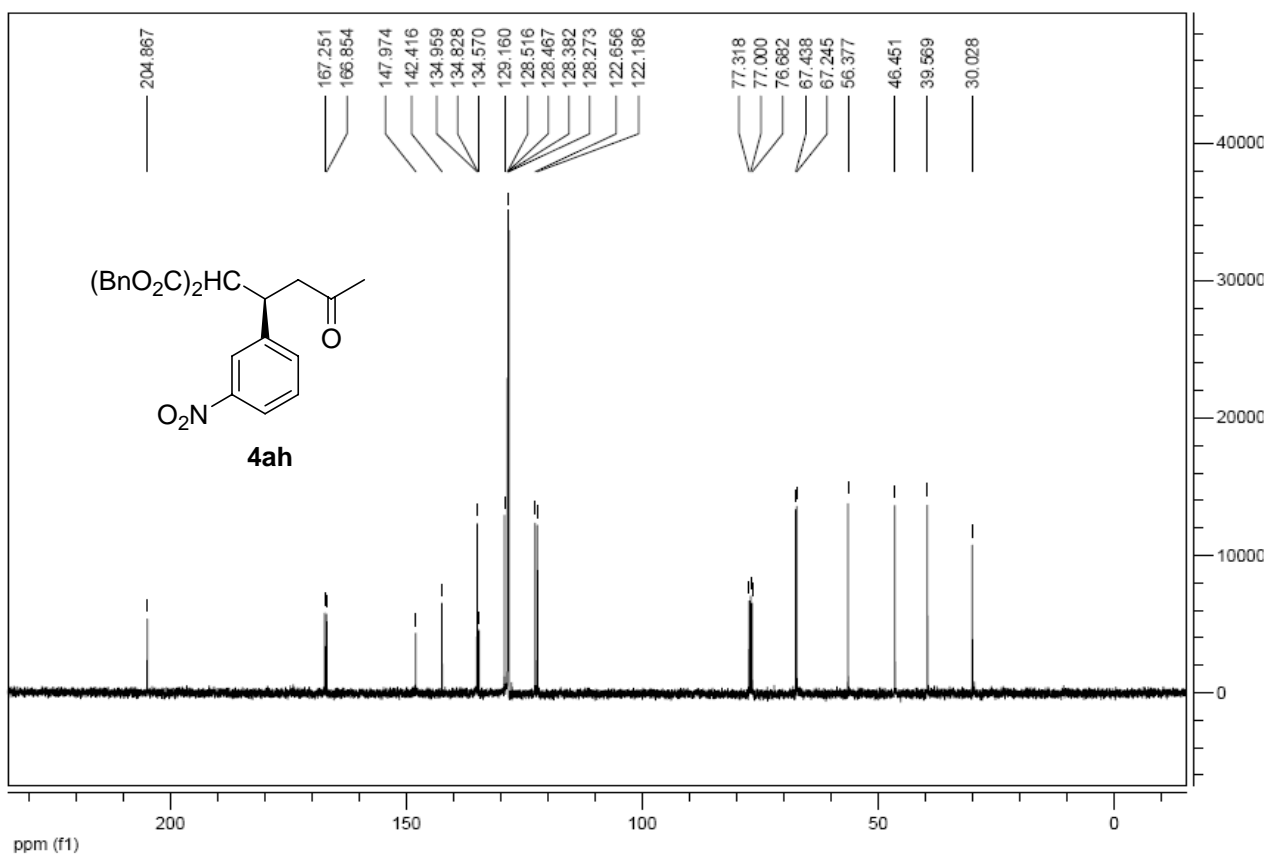
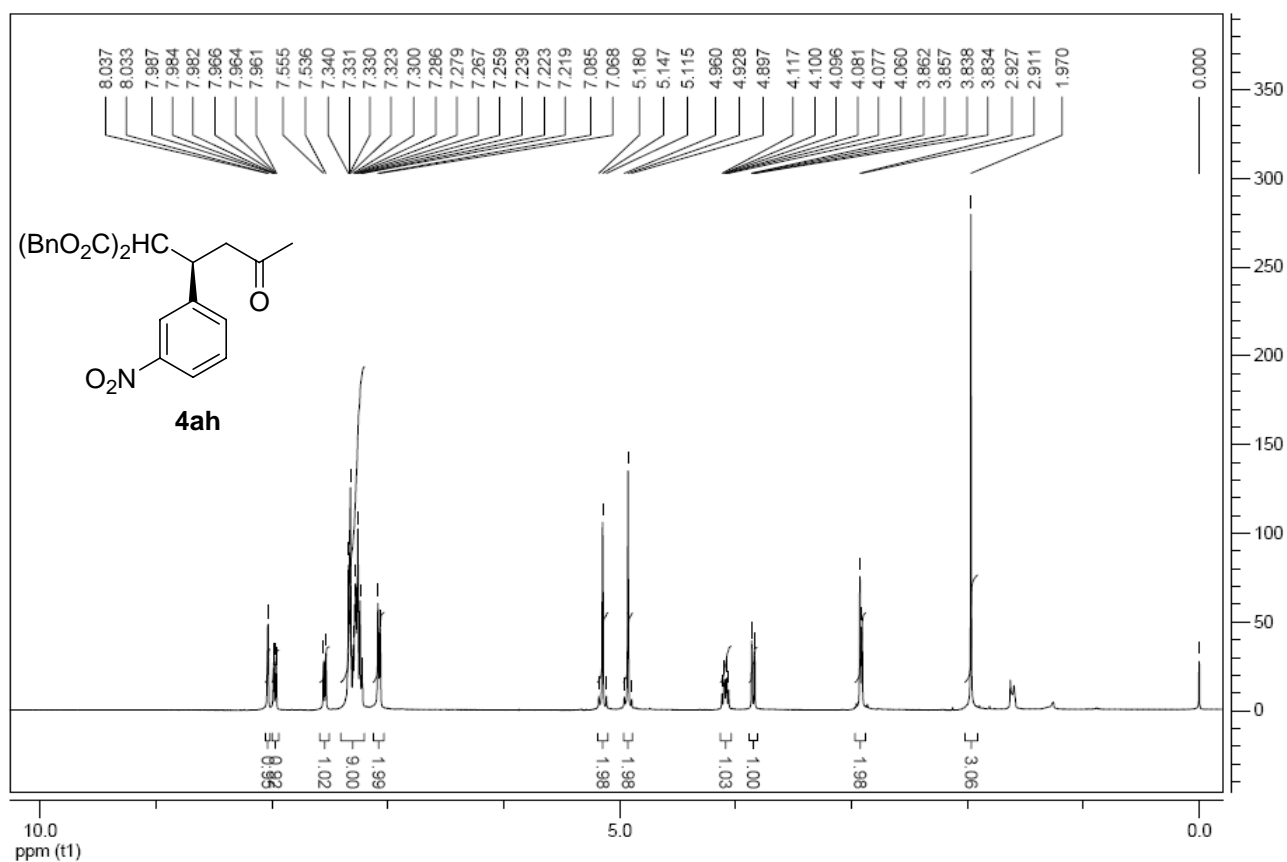
Fax: (+86)-10-68914985; E-mail: dudm@bit.edu.cn

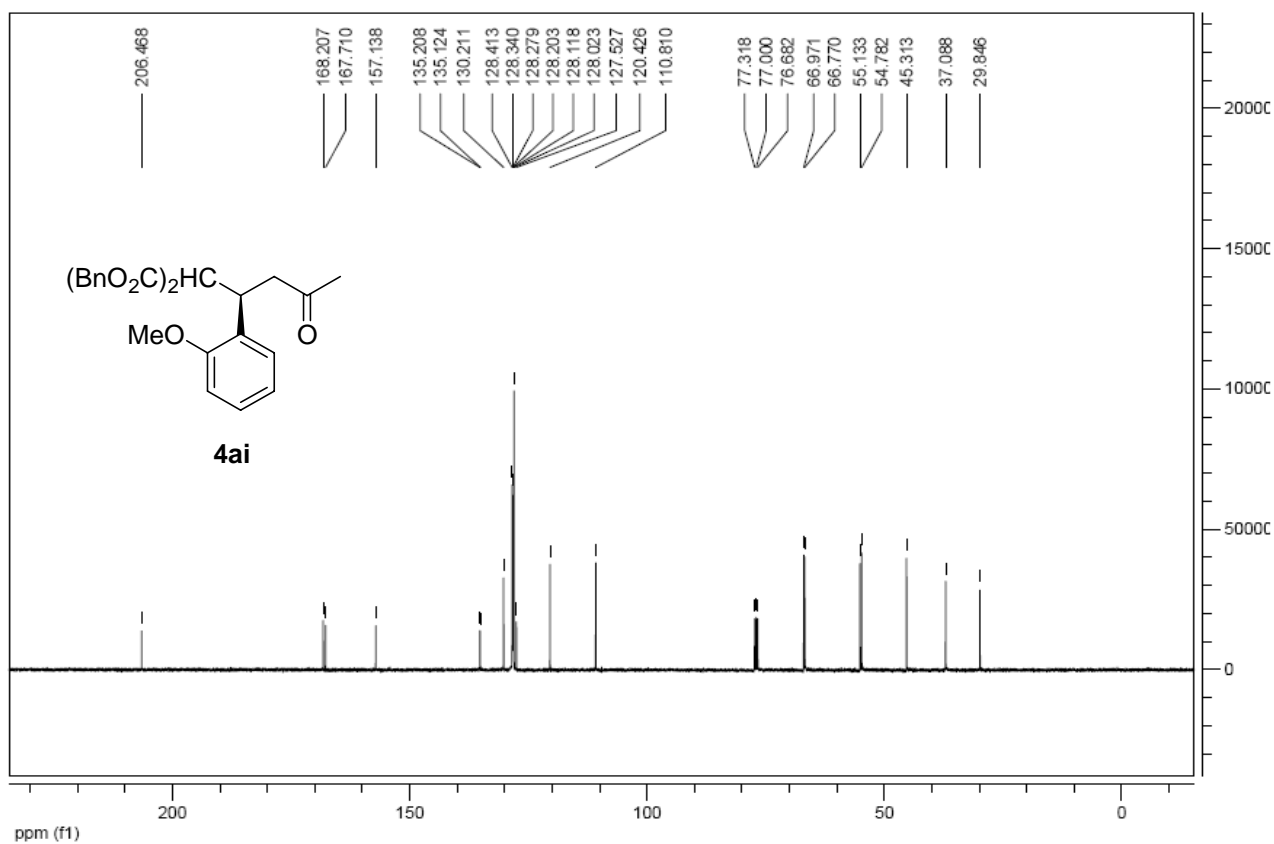
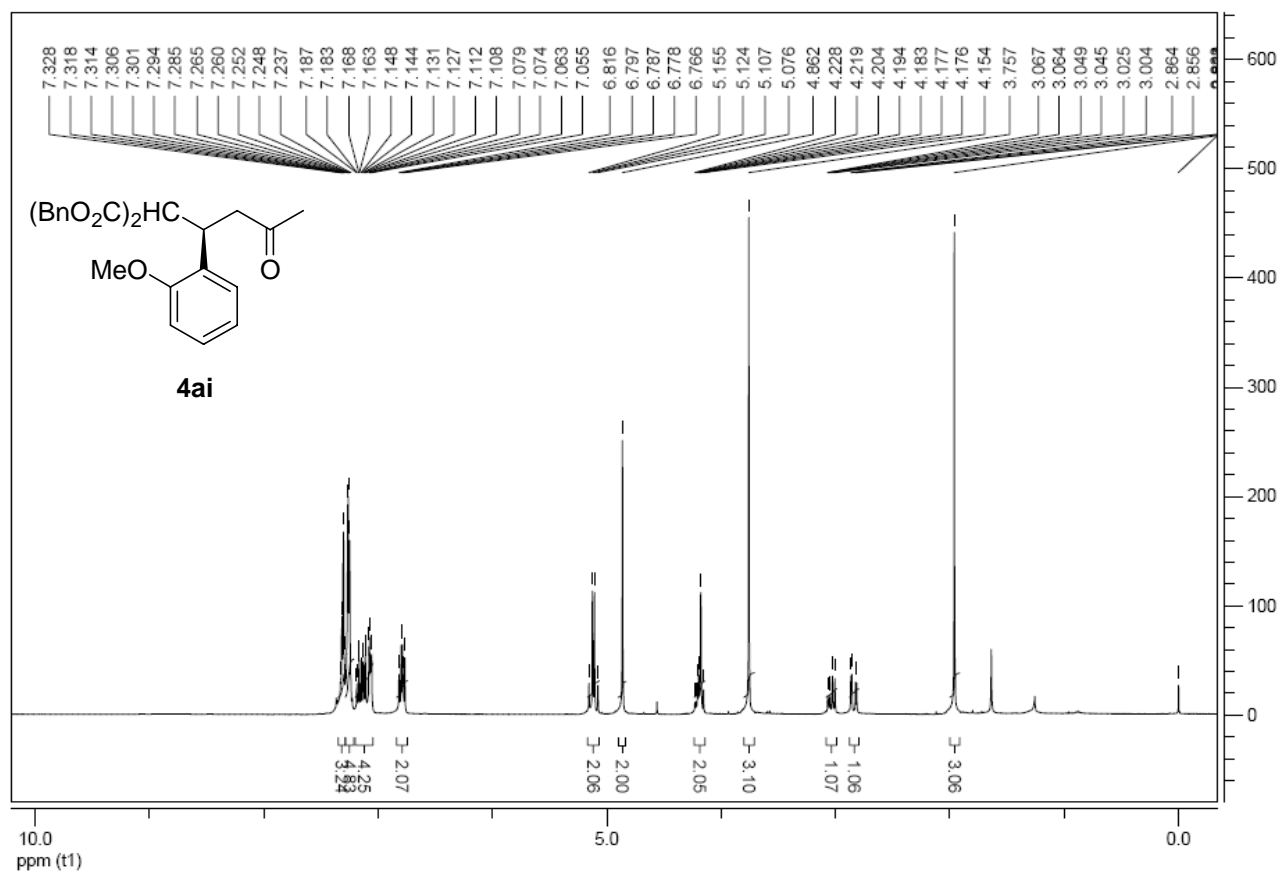
Supporting Information

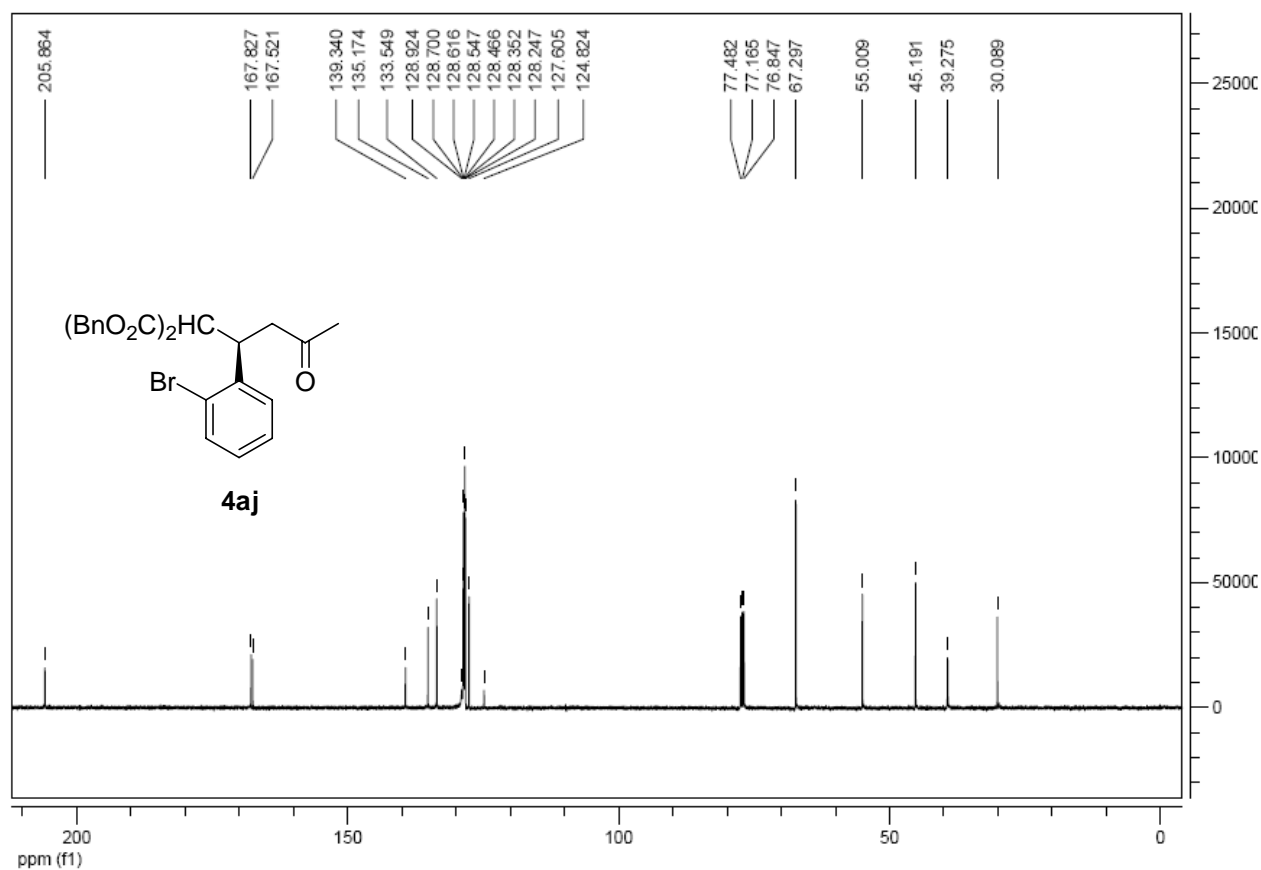
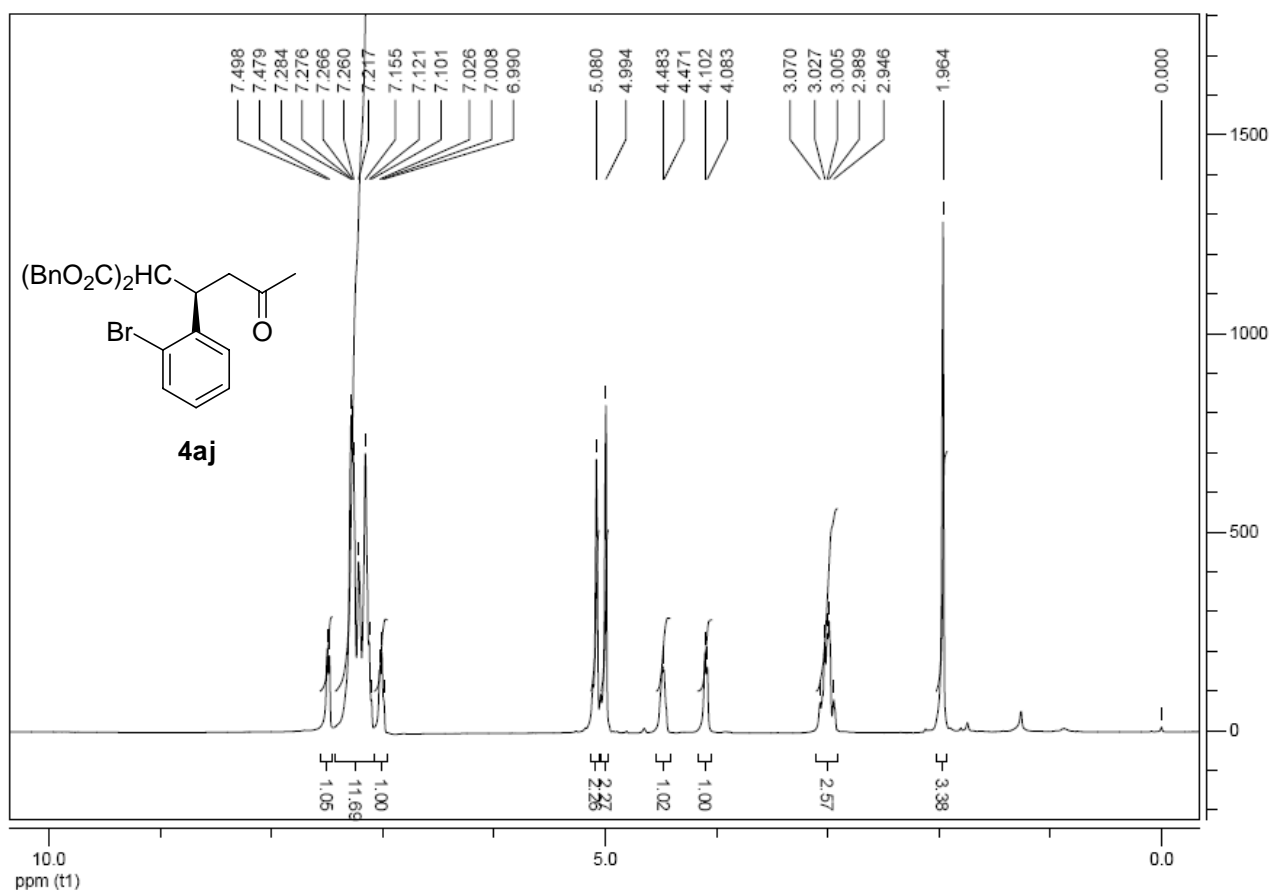
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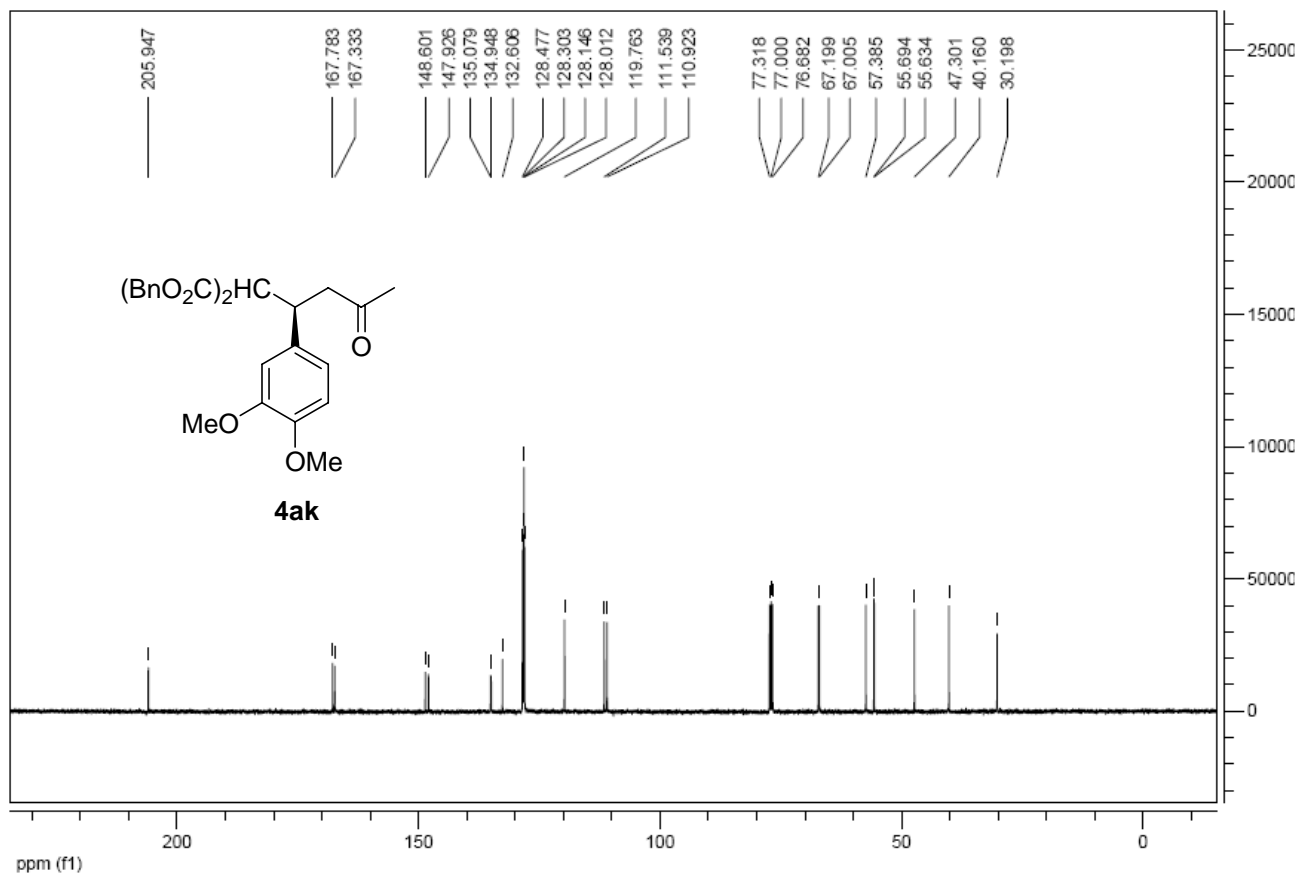
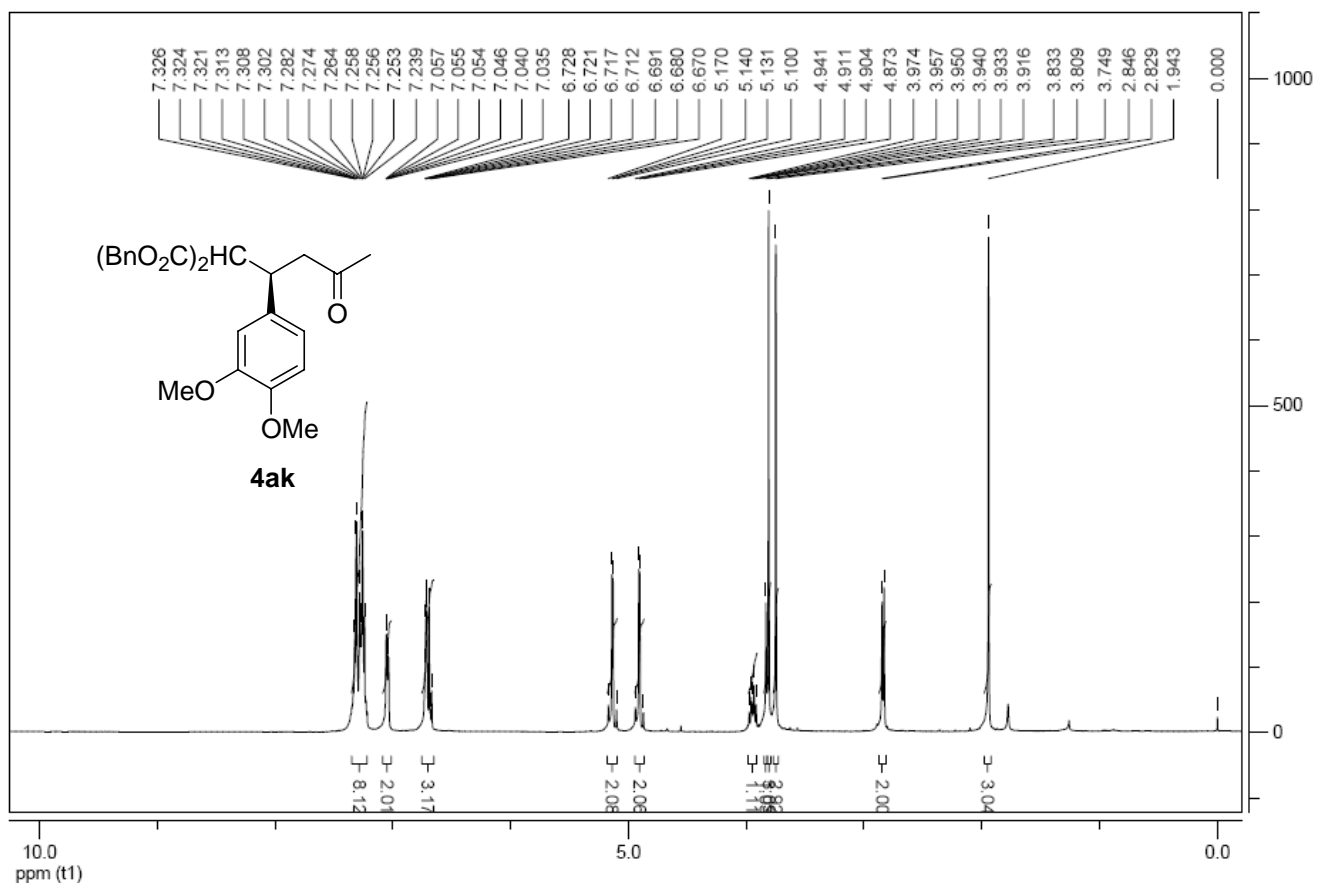
Copies of ^1H and ^{13}C NMR spectra of new compounds.....	S1
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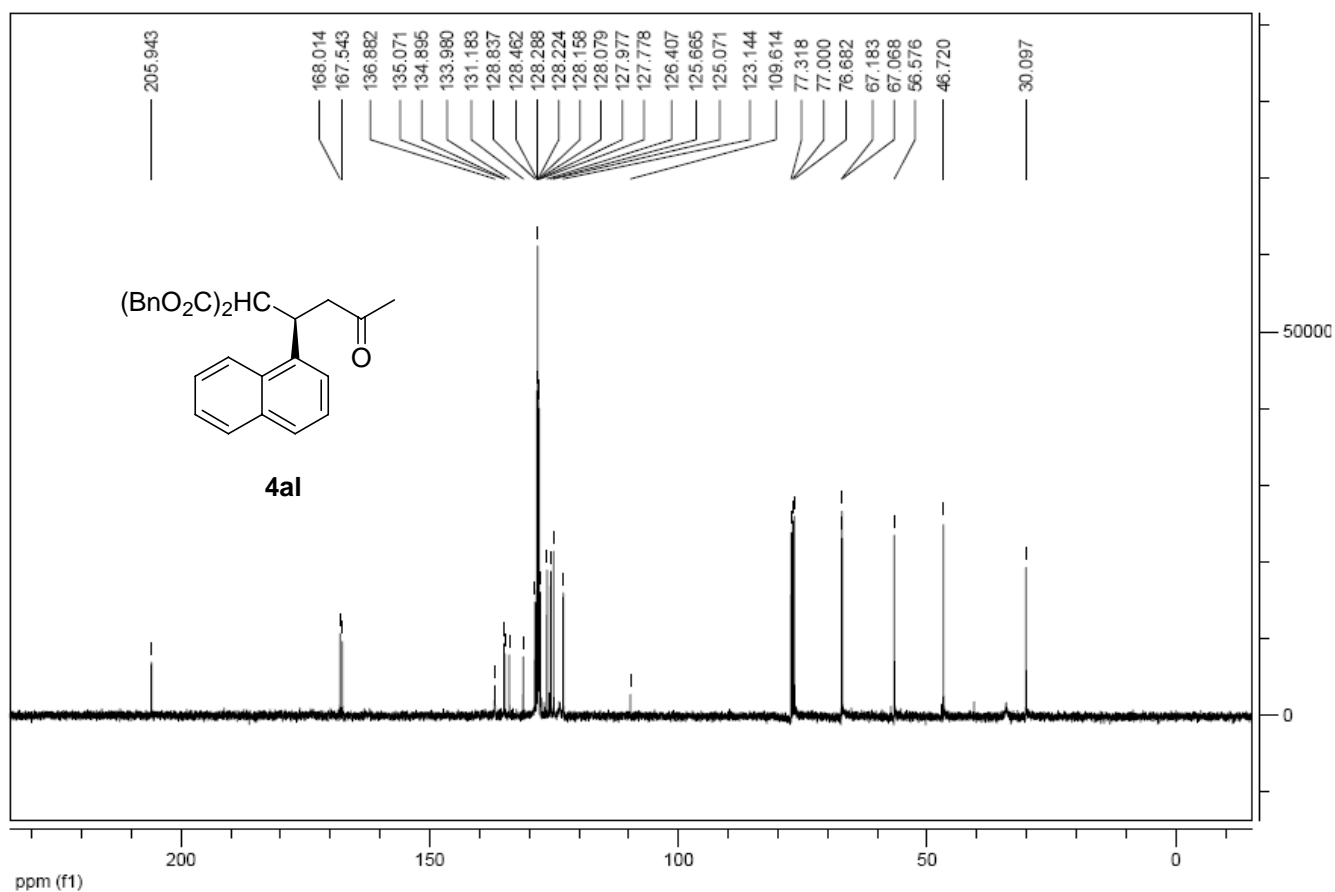
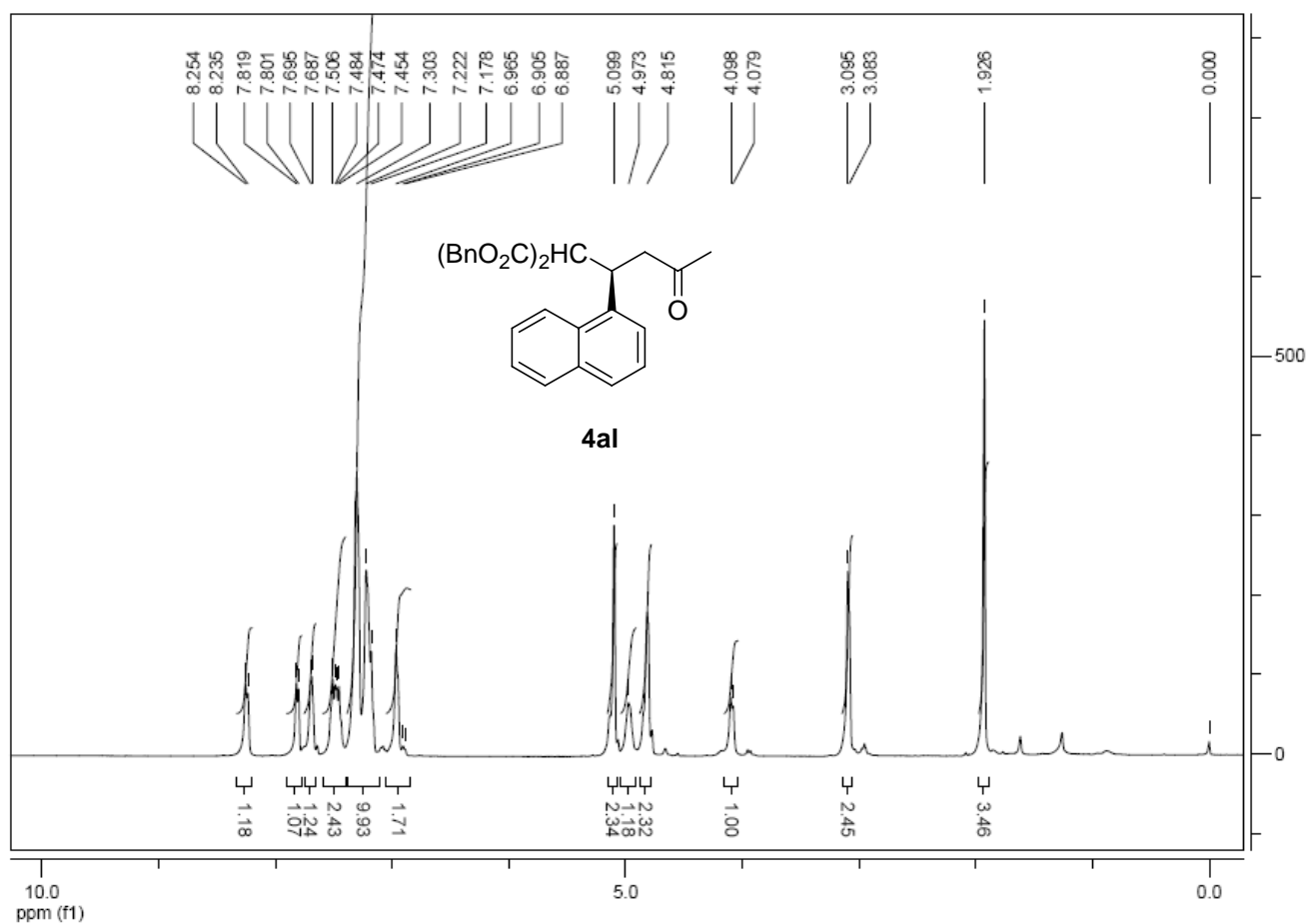
Copies of ^1H and ^{13}C NMR spectra of new compounds

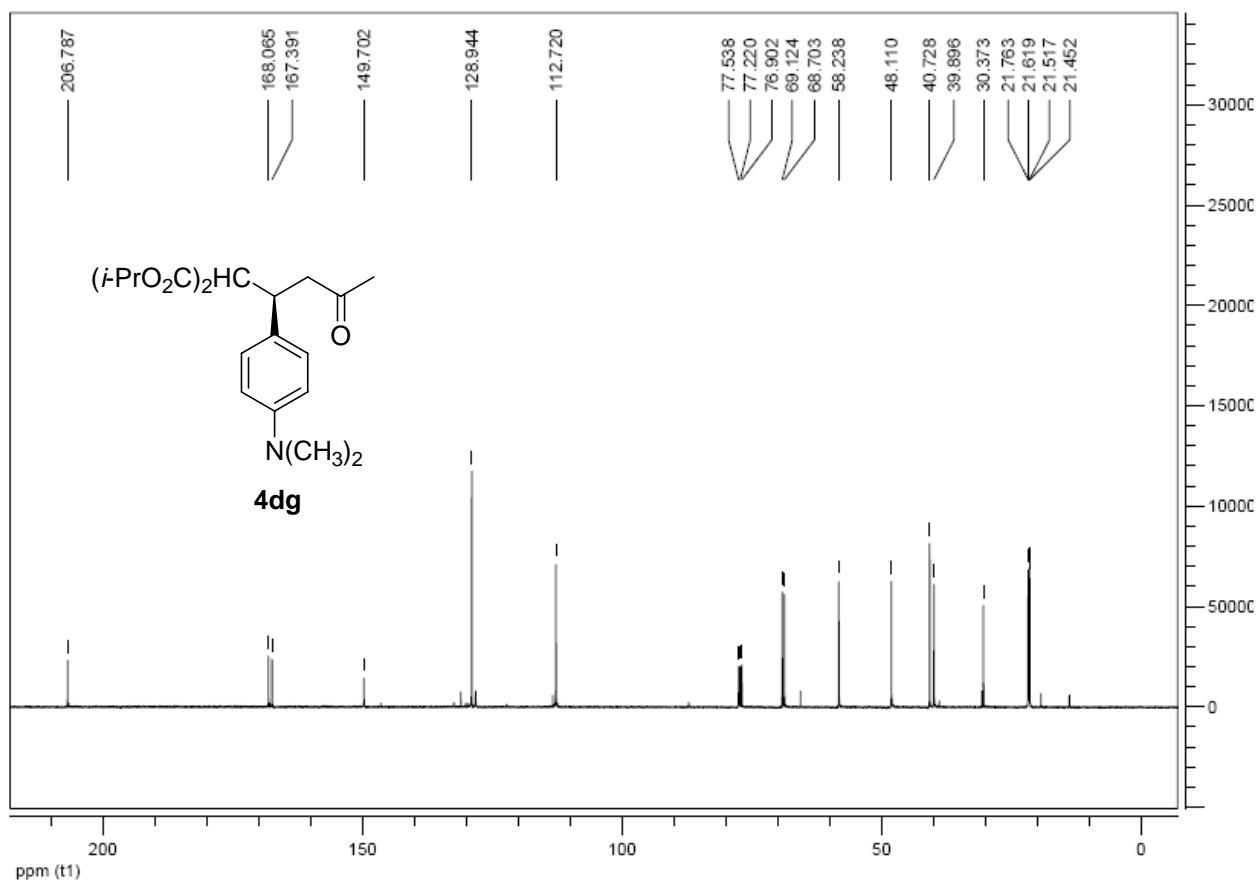
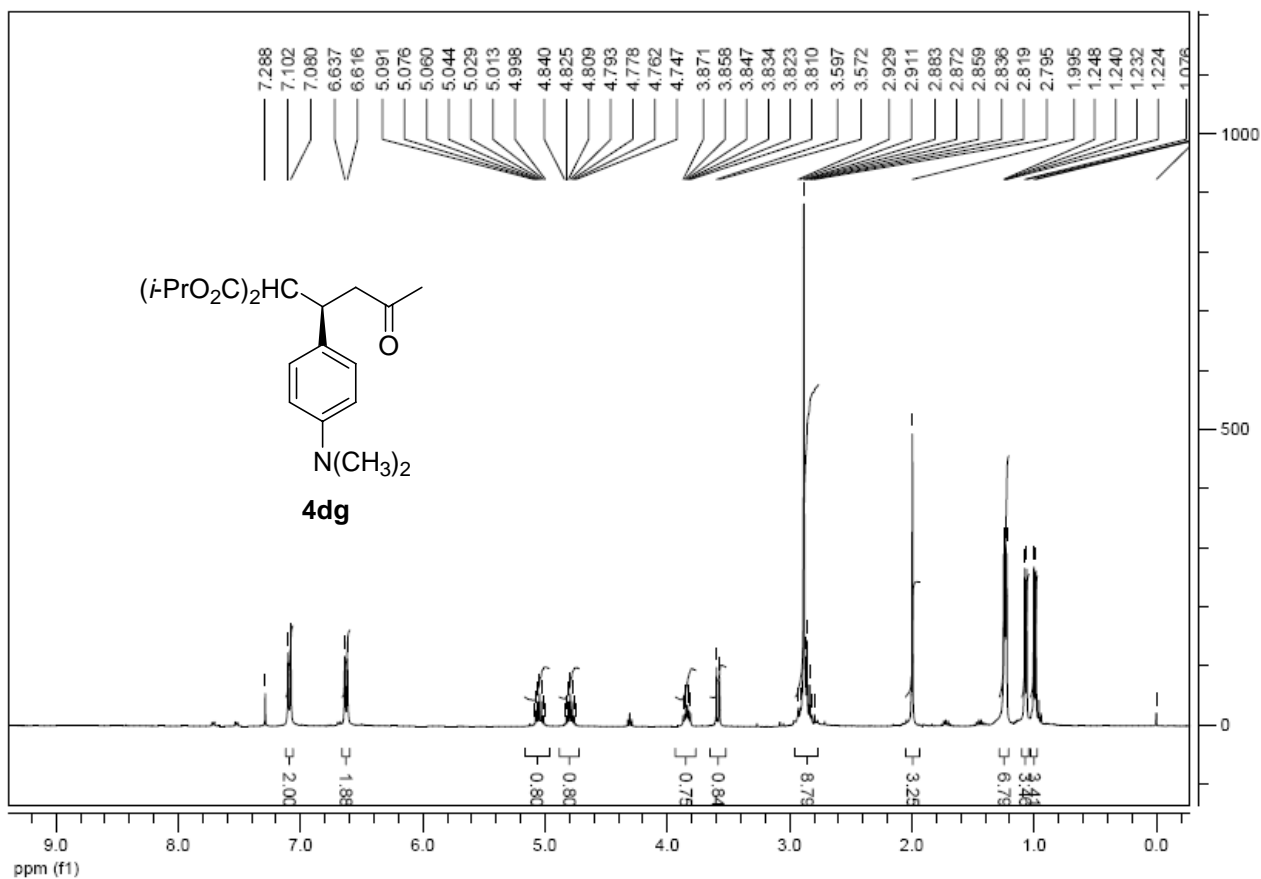






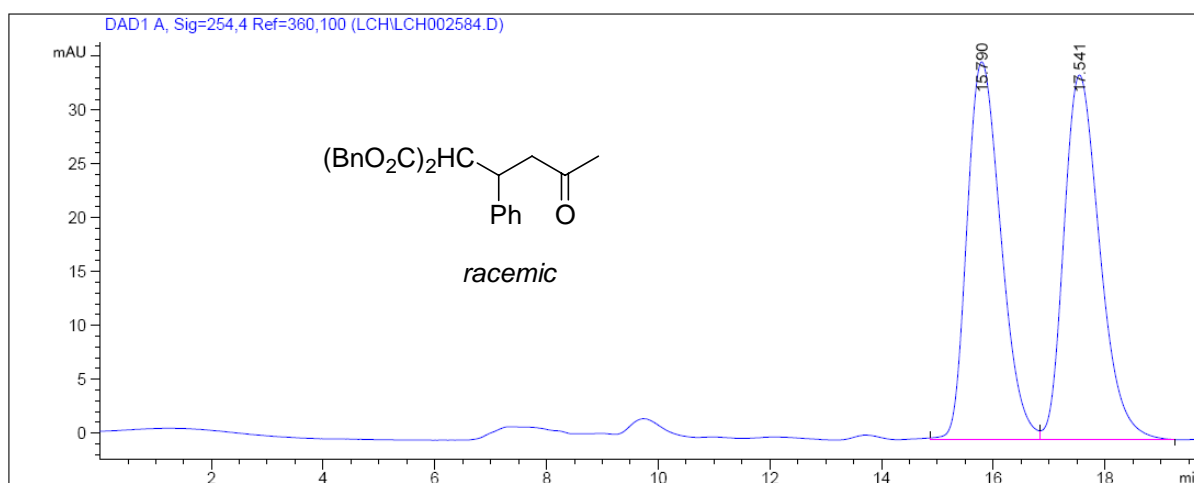




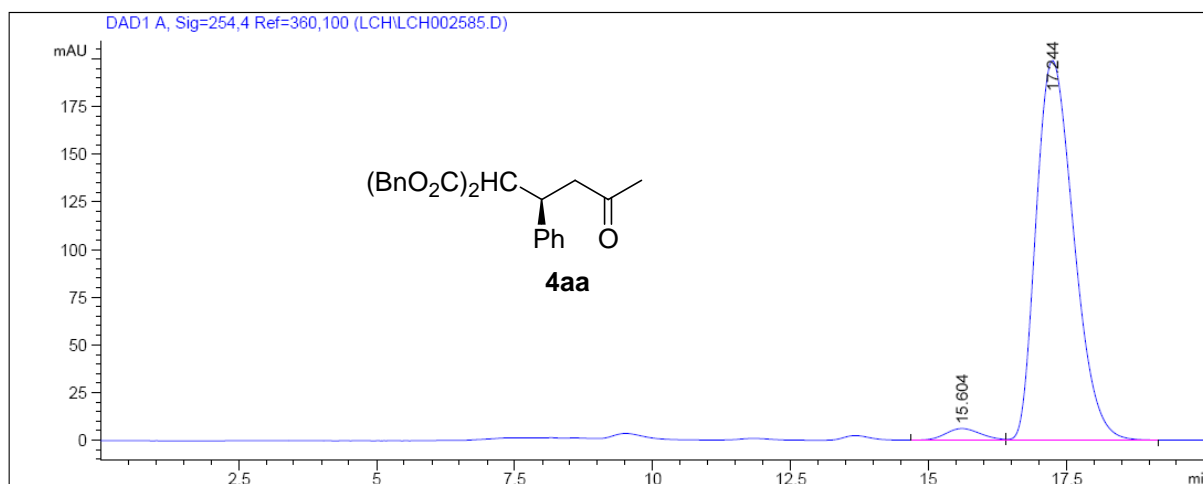


Copies of HPLC chromatograms of Michael addition products

HPLC chromatogram for compound **4aa**

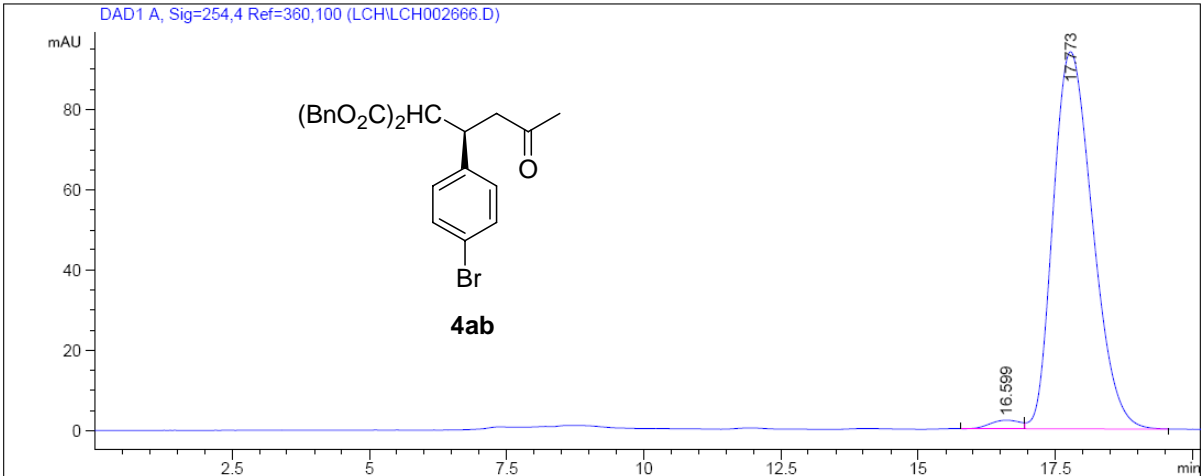
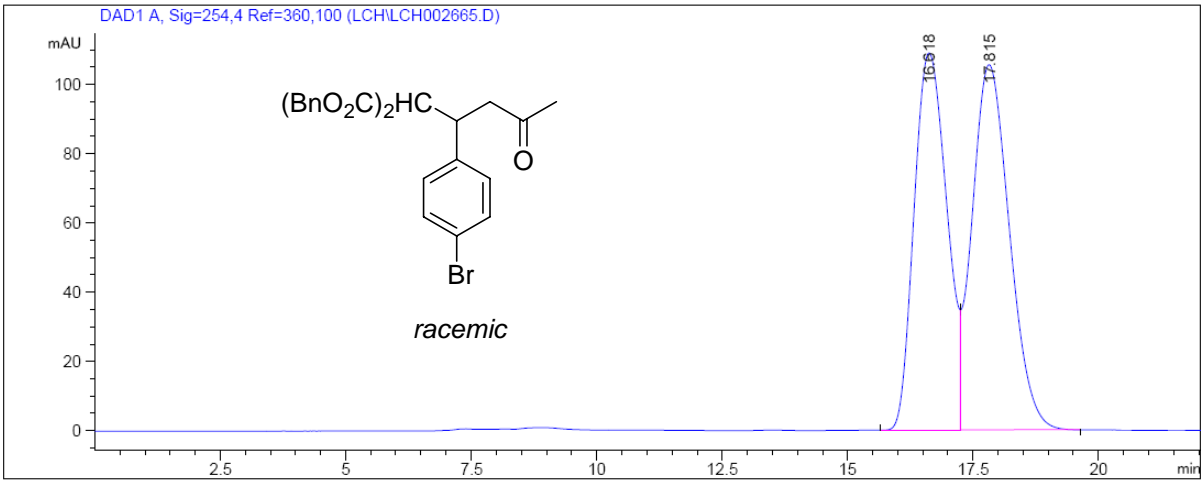


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1	15.790	BV	0.6595	1477.98157	35.08599	49.4766
2	17.541	VB	0.6922	1509.24915	33.85055	50.5234

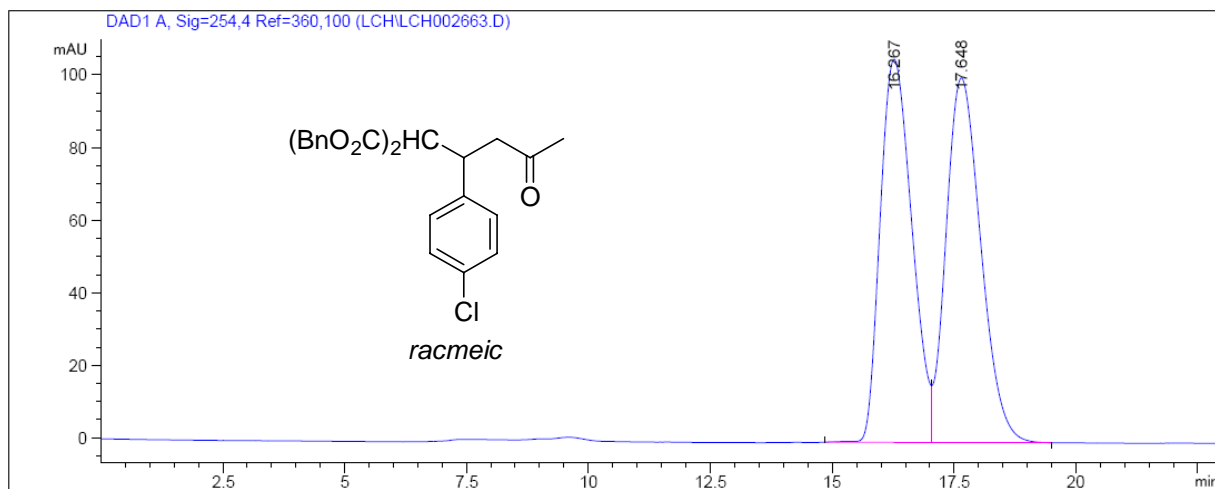


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
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1	15.604	BV	0.7082	273.19742	6.12697	2.8112
2	17.244	VB	0.7496	9445.12207	199.04536	97.1888

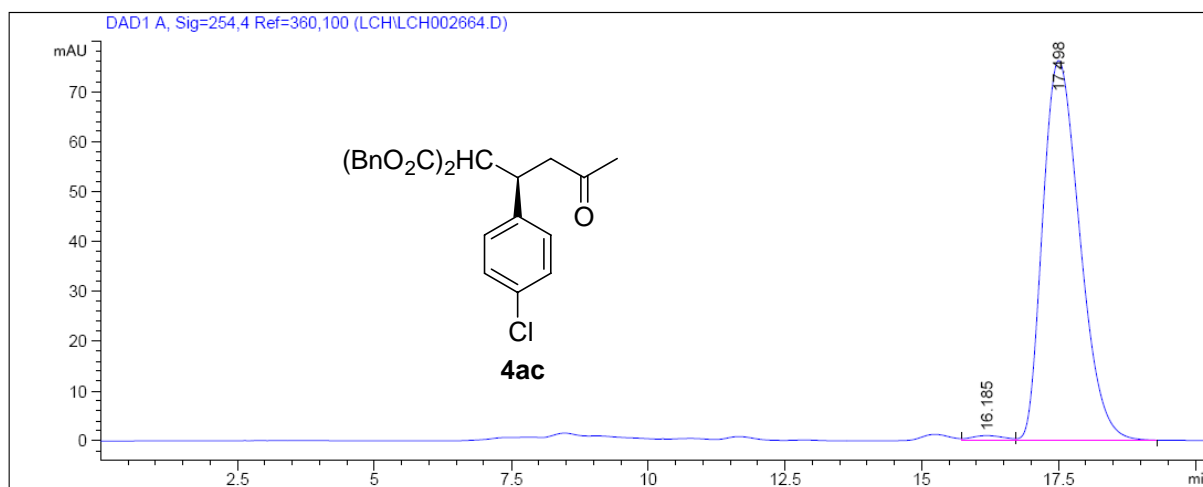
HPLC chromatogram for compound **4ab**



HPLC chromatogram for compound **4ac**

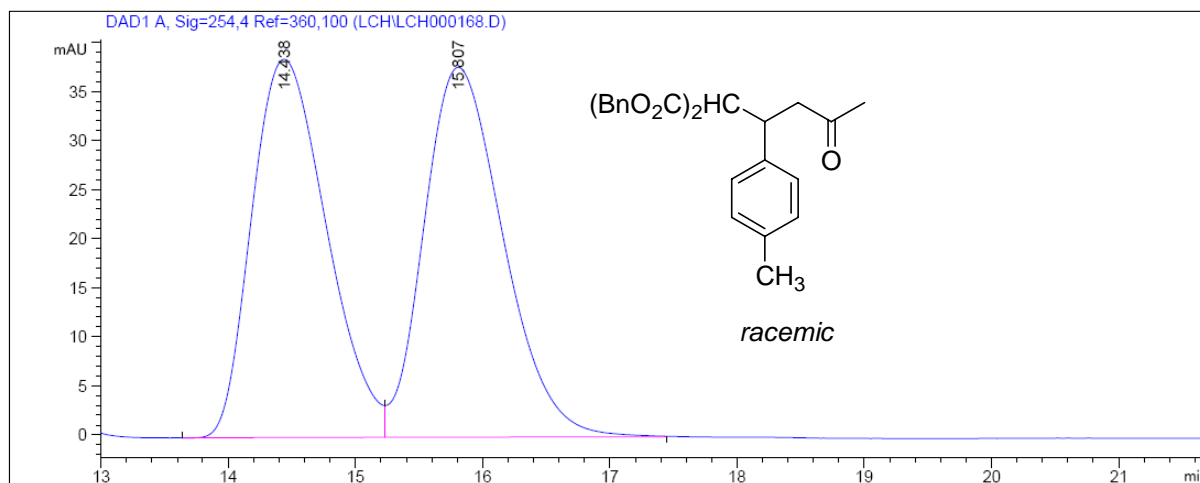


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峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	16.267	BV	0.7149	4769.00439	105.58973	48.8414
2	17.648	VB	0.7761	4995.25977	100.46175	51.1586

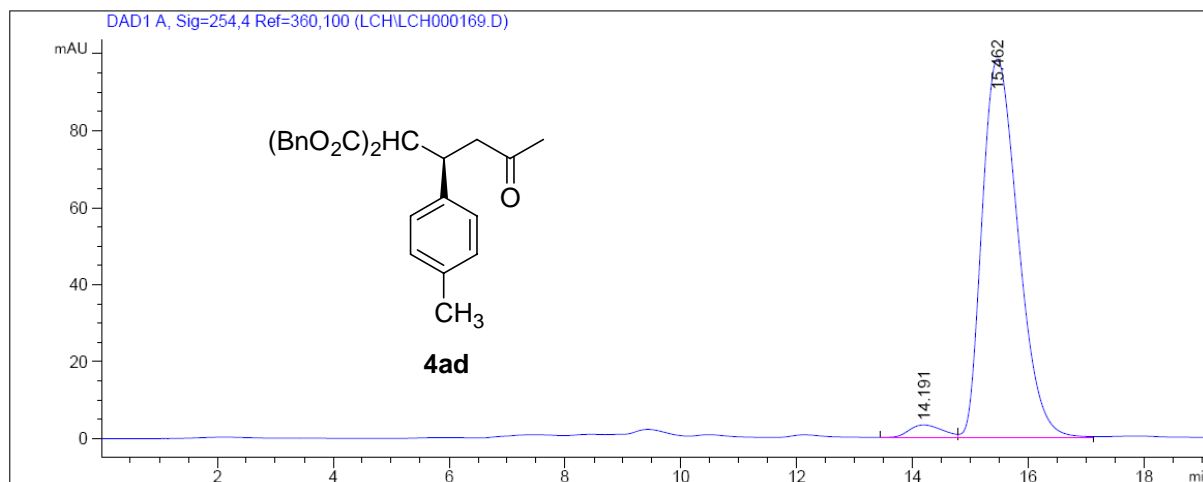


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	16.185	VV	0.5529	42.69107	1.01874	1.1767
2	17.498	VB	0.7496	3585.46533	76.11748	98.8233

HPLC chromatogram for compound **4ad**

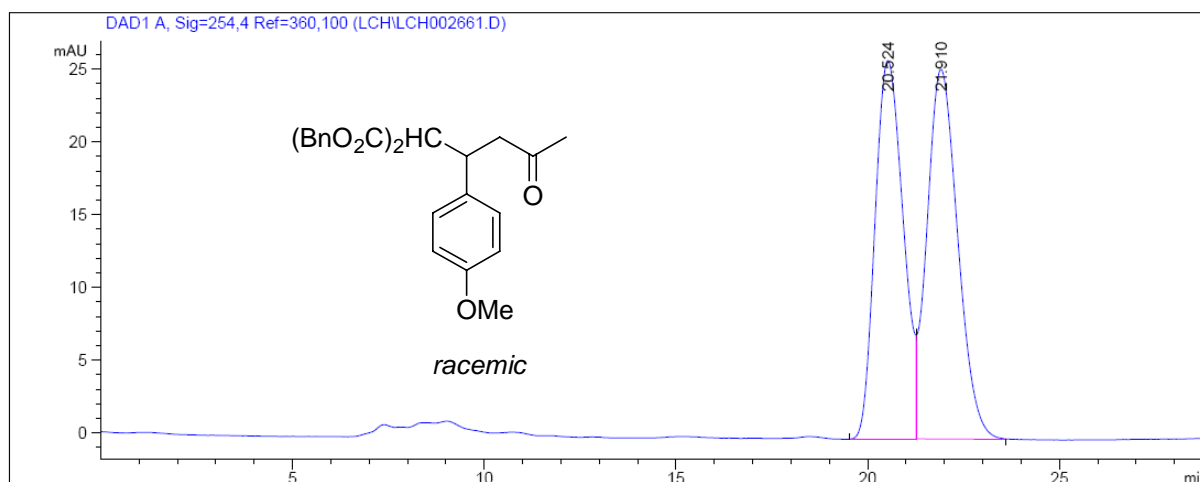


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	14.438	BV	0.6484	1575.32092	38.57943	49.0270
2	15.807	VB	0.6824	1637.84619	37.73279	50.9730

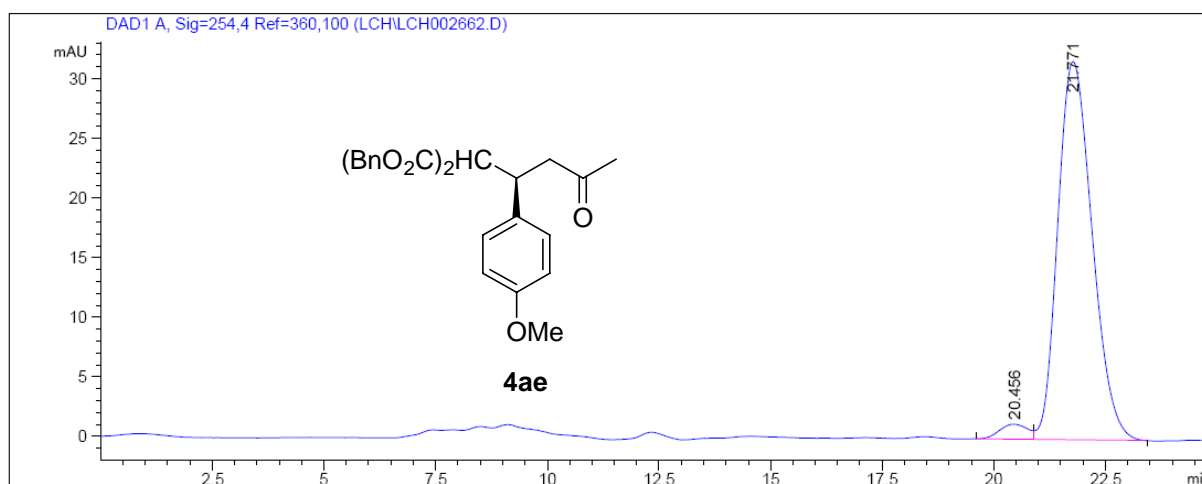


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	14.191	BV	0.5965	128.13028	3.24630	2.9379
2	15.462	VB	0.6777	4233.14453	98.43730	97.0621

HPLC chromatogram for compound **4ae**

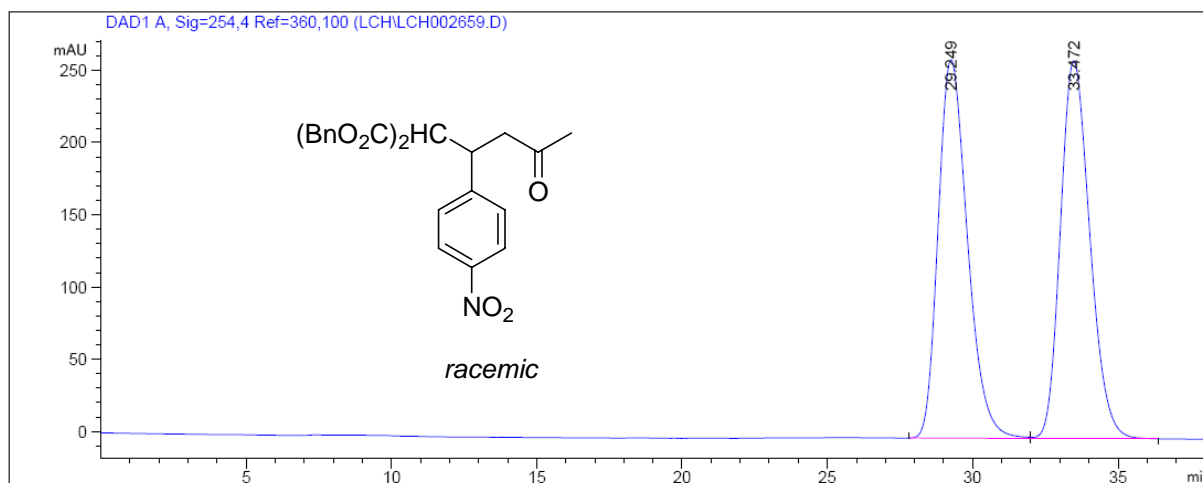


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峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	20.524	BV	0.8085	1321.59460	26.02495	48.1233
2	21.910	VB	0.8655	1424.67200	25.43569	51.8767

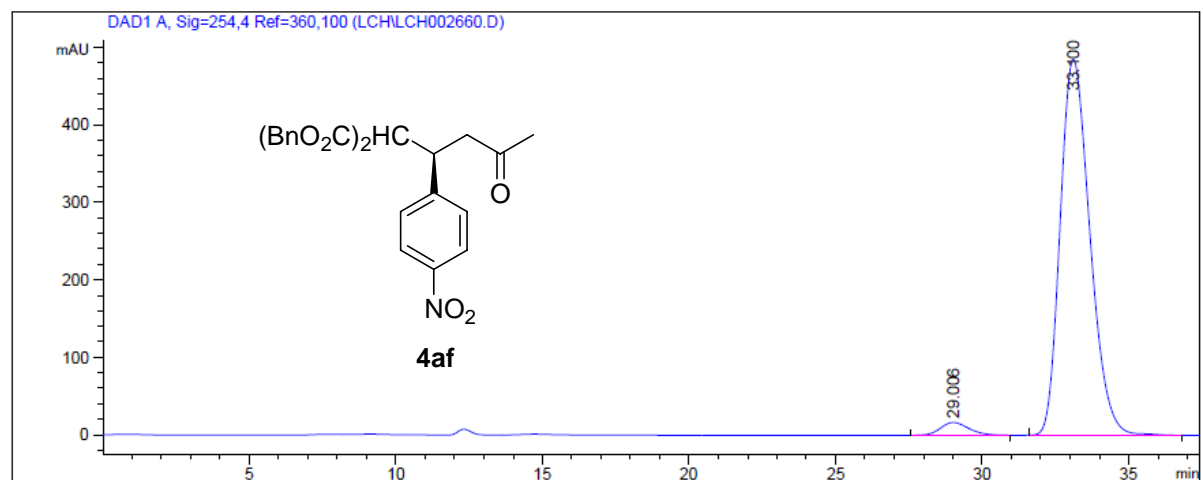


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1	20.456	BV	0.5364	55.73545	1.26892	3.1772
2	21.771	VB	0.8407	1698.47290	31.71951	96.8228

HPLC chromatogram for compound **4af**

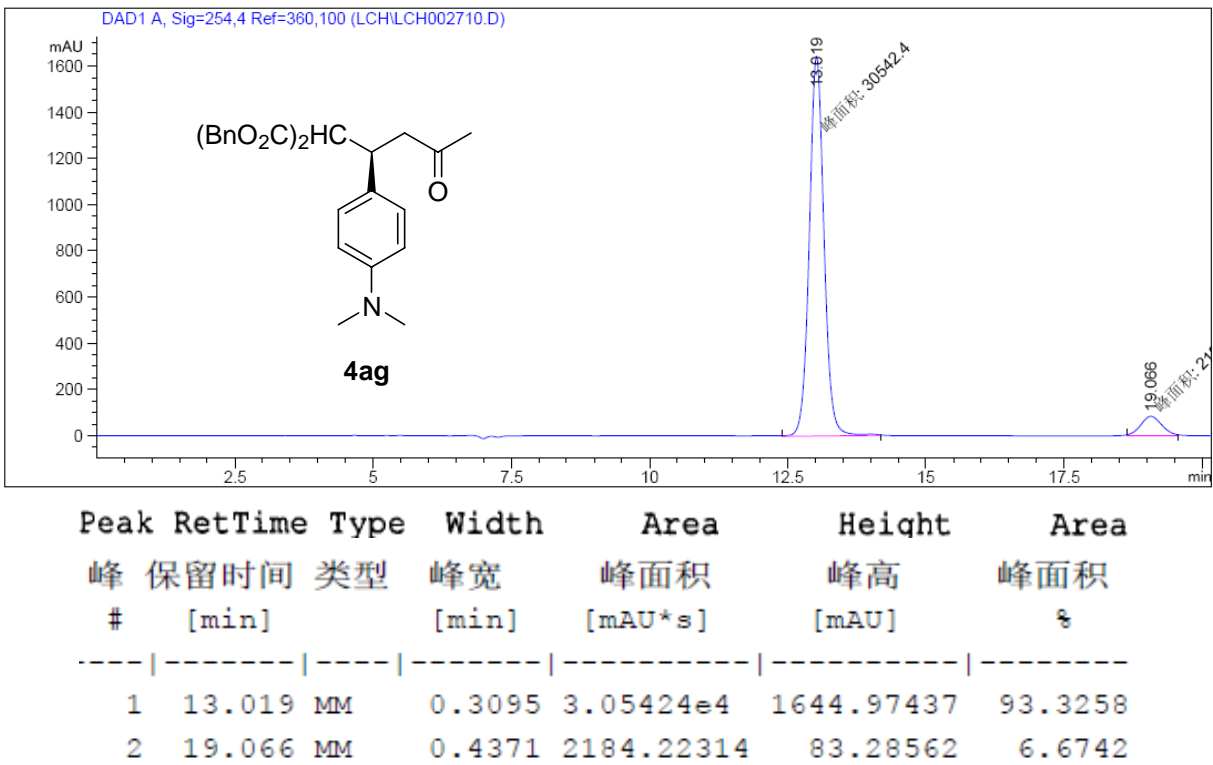
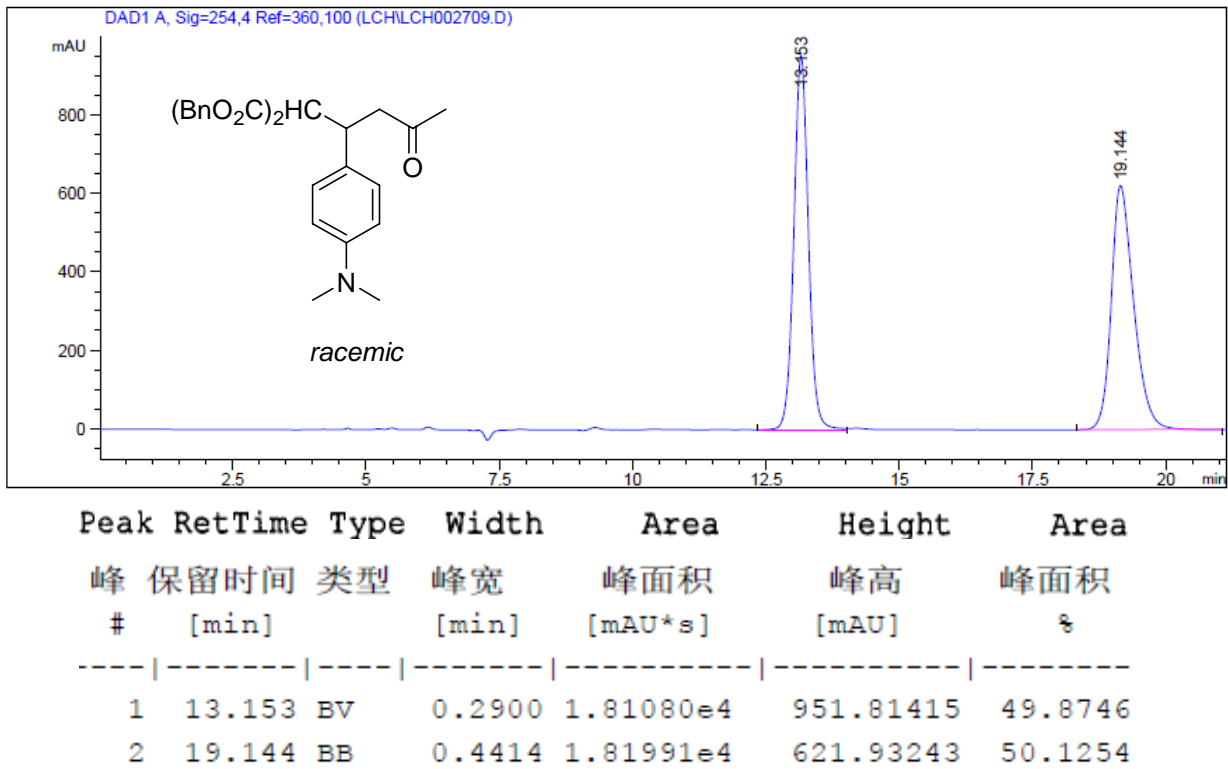


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峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	29.249	BV	1.0921	1.83204e4	261.90460	49.9019
2	33.472	VB	1.0967	1.83924e4	261.46405	50.0981

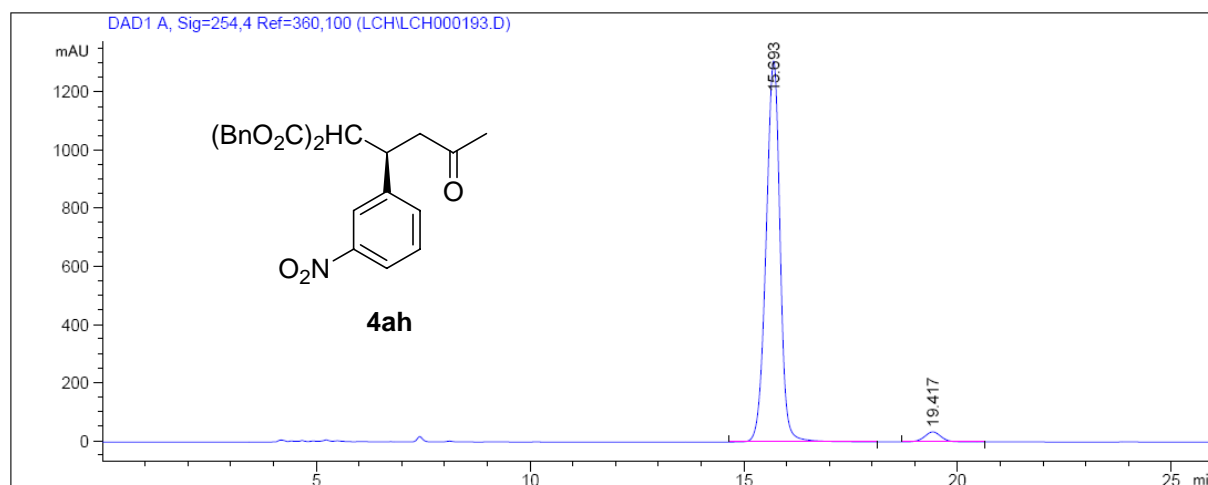
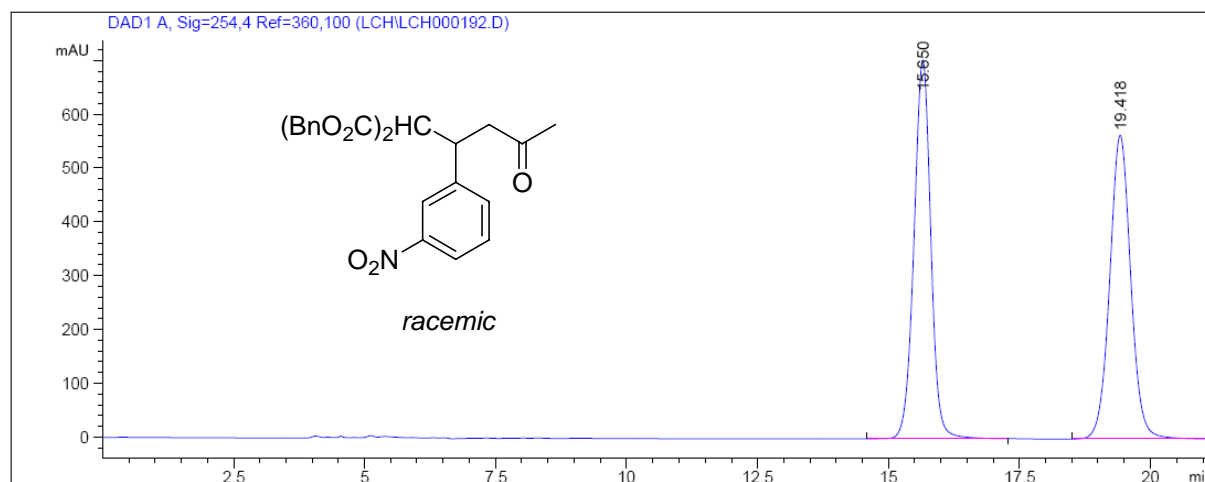


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	29.006	BB	1.0566	1152.77515	16.71489	3.2544
2	33.100	BB	1.1034	3.42693e4	485.54865	96.7456

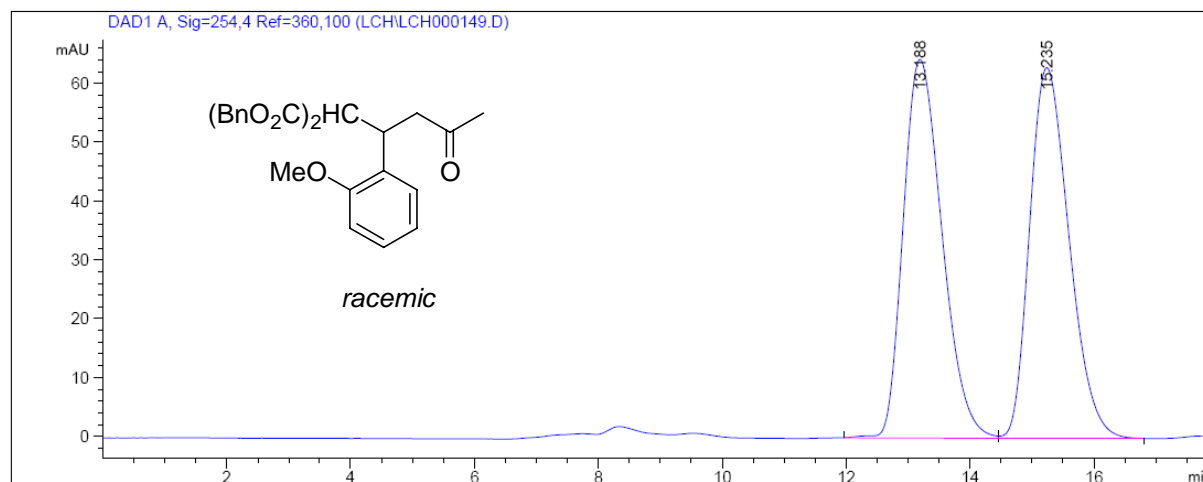
HPLC chromatogram for compound **4ag**



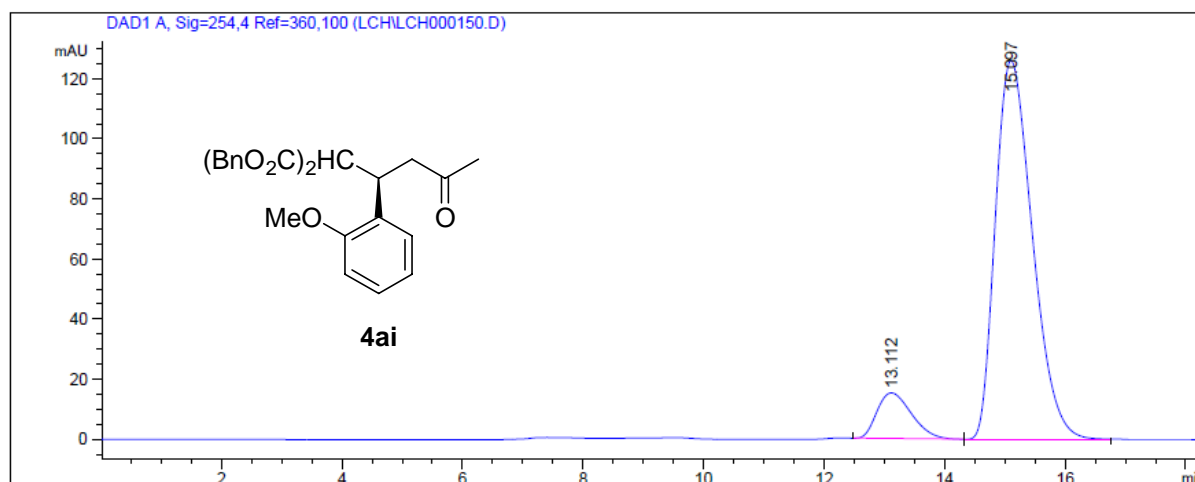
HPLC chromatogram for compound **4ah**



HPLC chromatogram for compound **4ai**

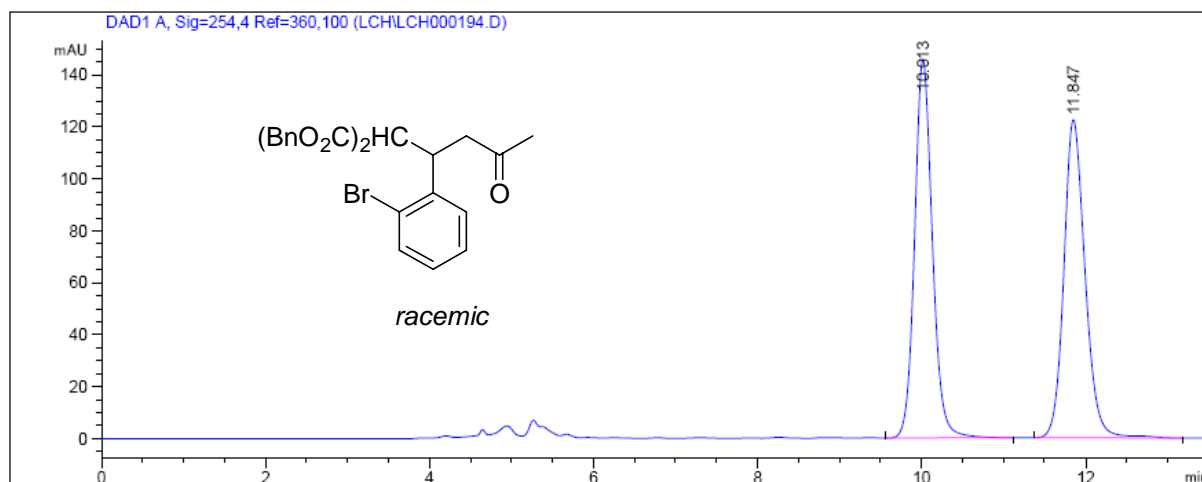


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1	13.188	BV	0.6839	2804.17017	64.41107	50.1661
2	15.235	VB	0.6955	2785.60327	63.04295	49.8339

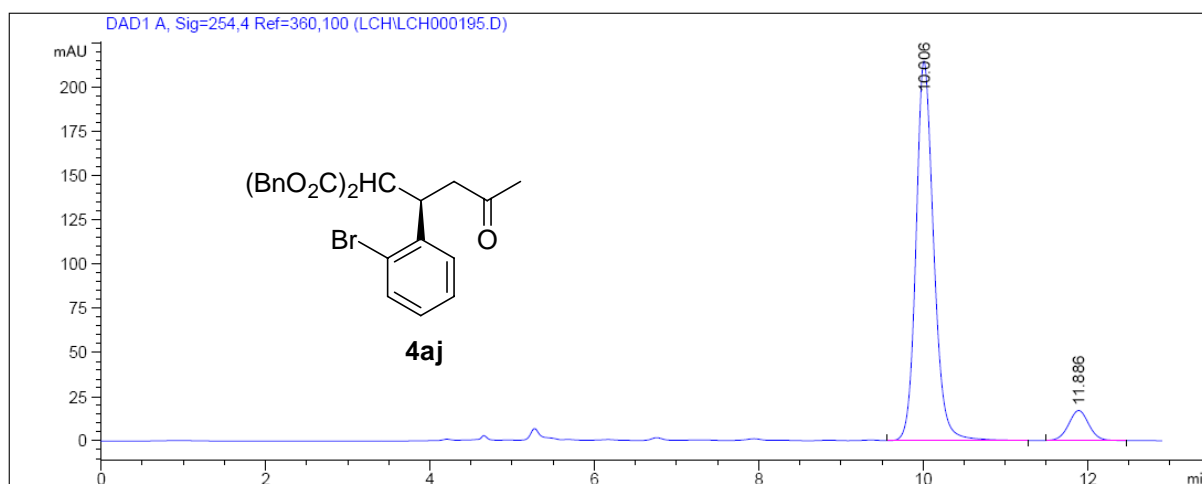


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1	13.112	BV	0.6279	605.14868	15.22025	10.1176
2	15.097	VB	0.6694	5376.00000	126.08524	89.8824

HPLC chromatogram for compound **4aj**

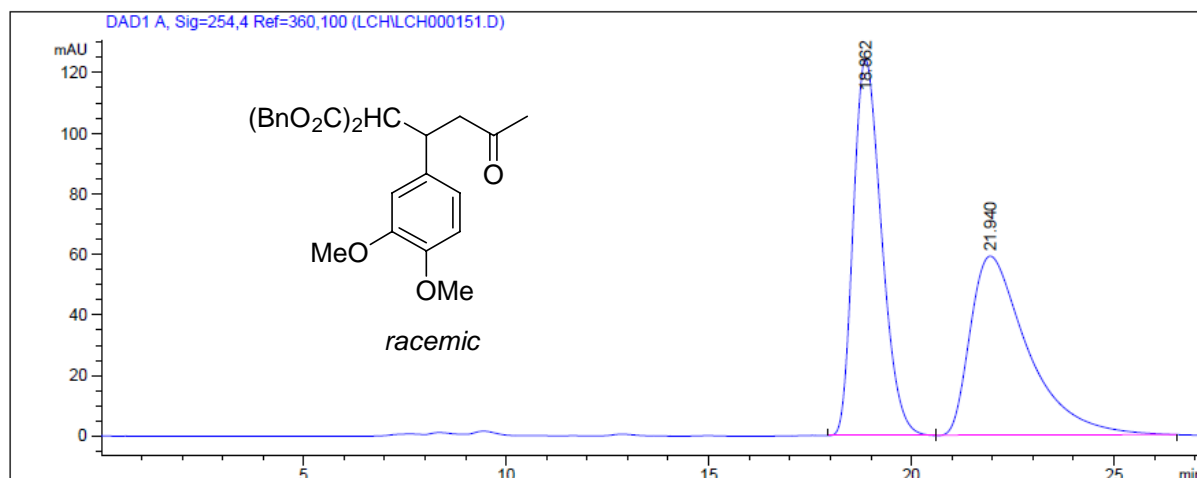


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	10.013	VB S	0.2322	2197.98804	145.56929	49.9449
2	11.847	BB	0.2739	2202.84082	122.45567	50.0551

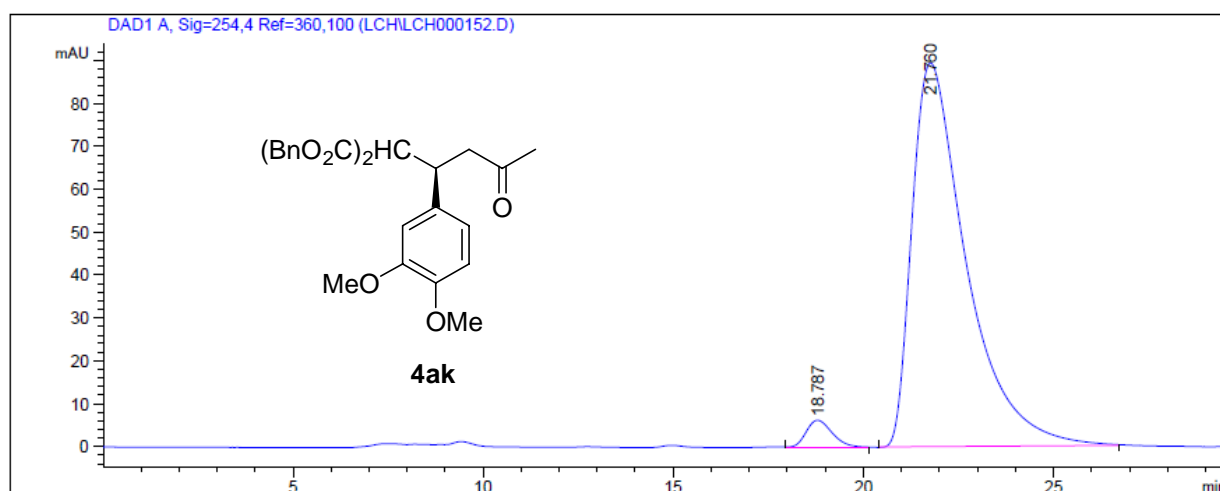


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	10.006	PB S	0.2303	3207.23315	214.64417	91.7468
2	11.886	BB	0.2626	288.51126	16.95054	8.2532

HPLC chromatogram for compound **4ak**

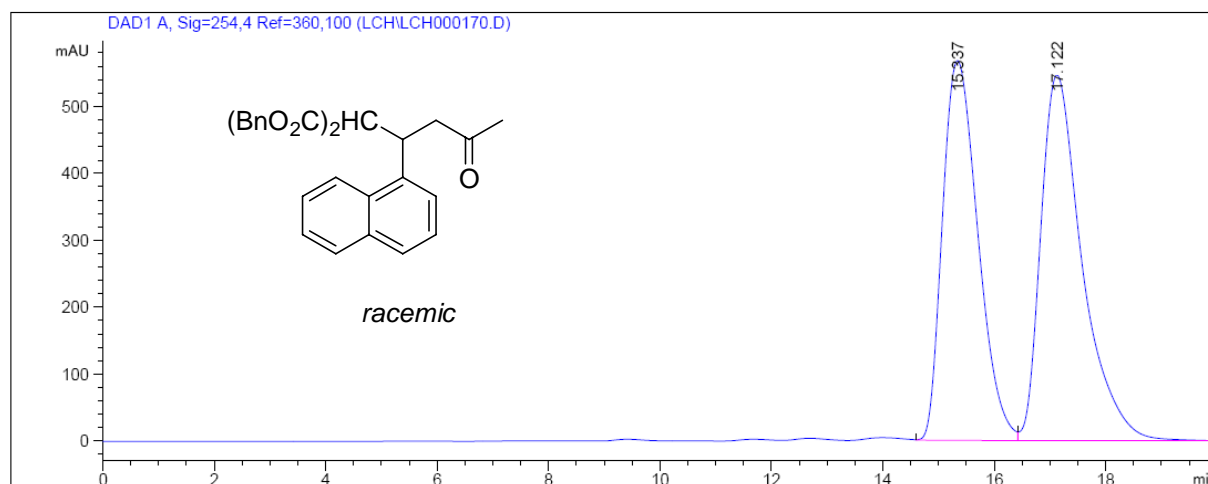


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	18.862	BV	0.7607	6019.65186	124.37415	50.6141
2	21.940	VB	1.4757	5873.58252	59.29278	49.3859

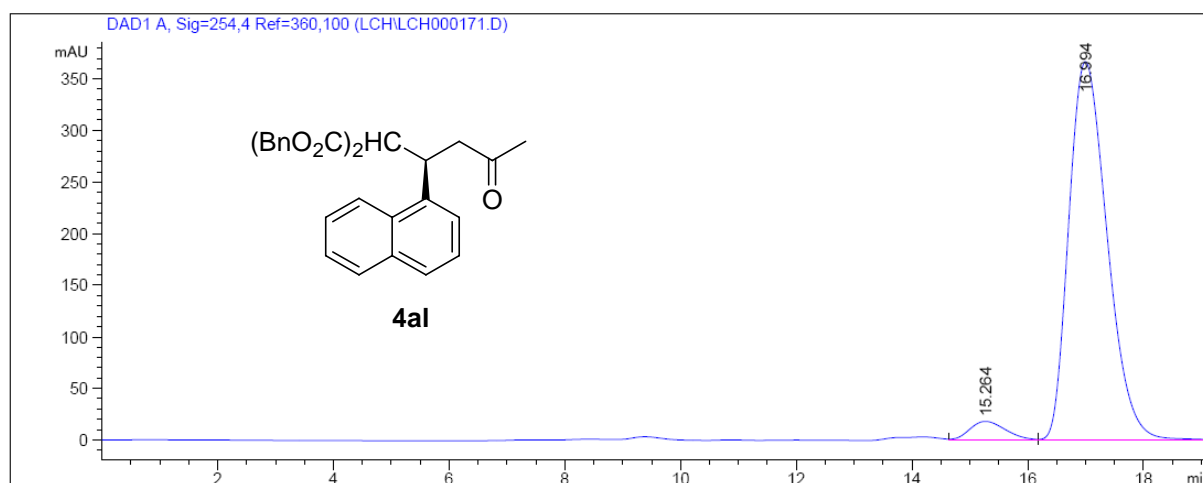


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1	18.787	BB	0.7347	298.18439	6.27152	3.2387
2	21.760	BB	1.4727	8908.75977	89.54342	96.7613

HPLC chromatogram for compound **4al**

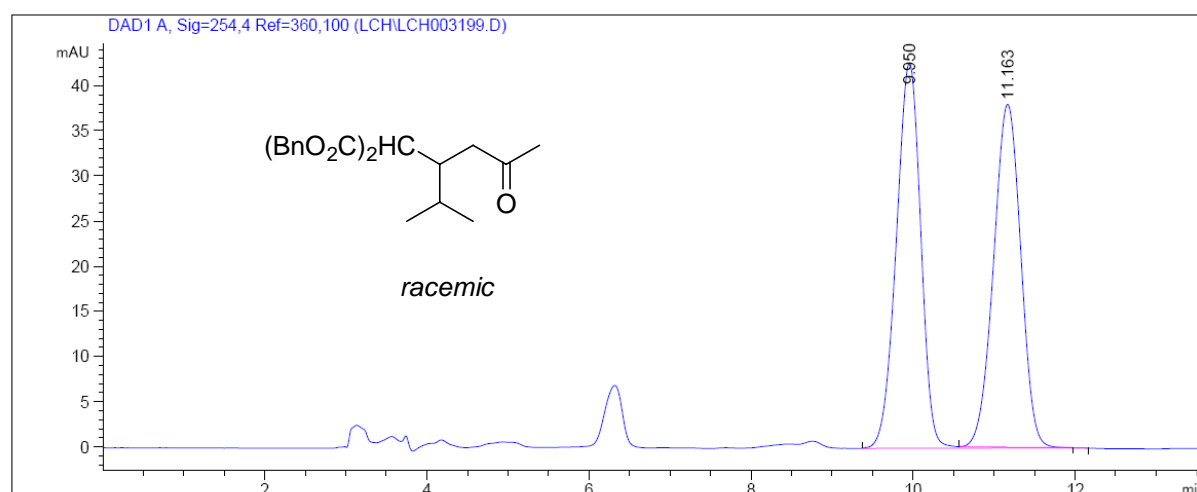


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1	15.337	VV	0.6951	2.50691e4	567.80225	47.0838
2	17.122	VV	0.7816	2.81744e4	546.41077	52.9162

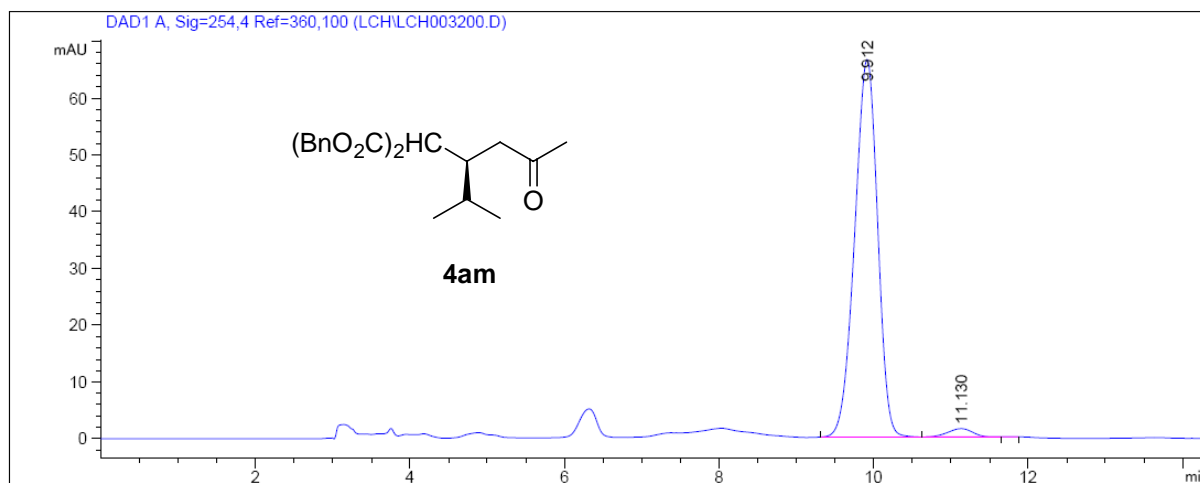


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1	15.264	VV	0.6983	813.76093	18.46030	4.5817
2	16.994	VBA	0.7266	1.69472e4	367.06653	95.4183

HPLC chromatogram for compound **4am**

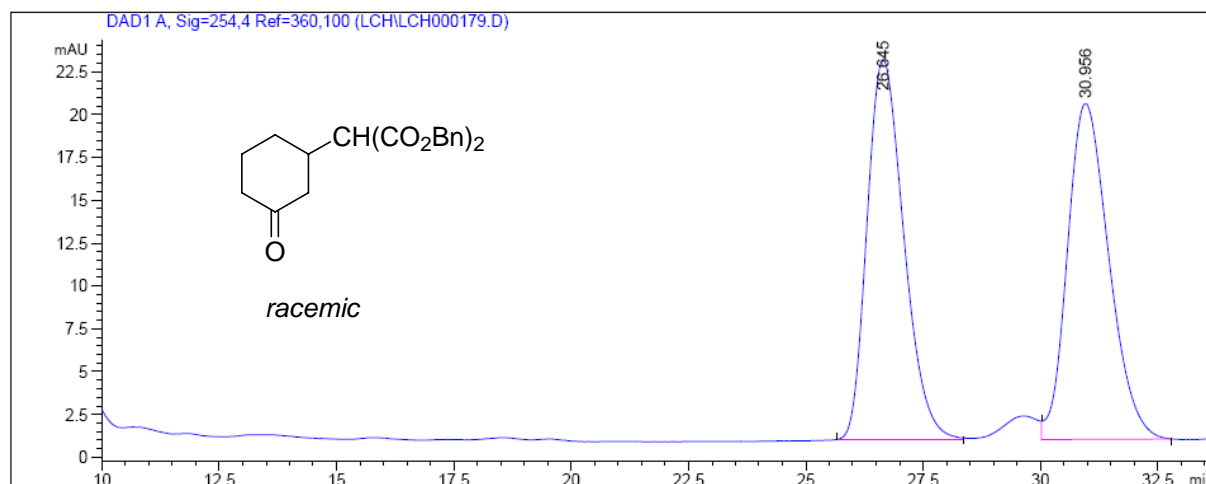


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1	9.950	BB S	0.3304	901.66962	42.69049	50.4305
2	11.163	BB X	0.3641	886.27496	37.99461	49.5695

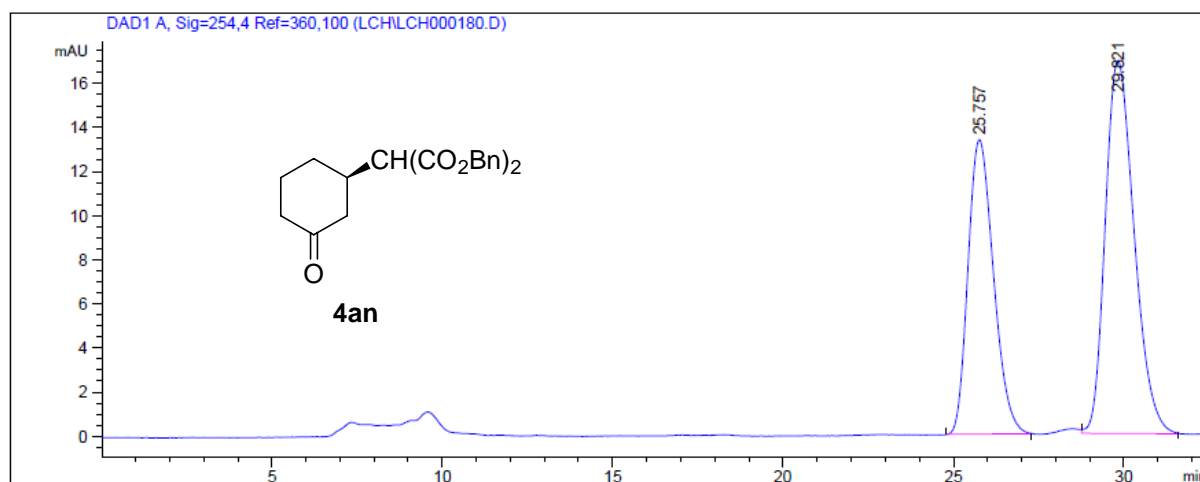


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1	9.912	BB S	0.3245	1371.35522	66.51813	97.6713
2	11.130	BB T	0.3440	32.69576	1.46719	2.3287

HPLC chromatogram for compound **4an**

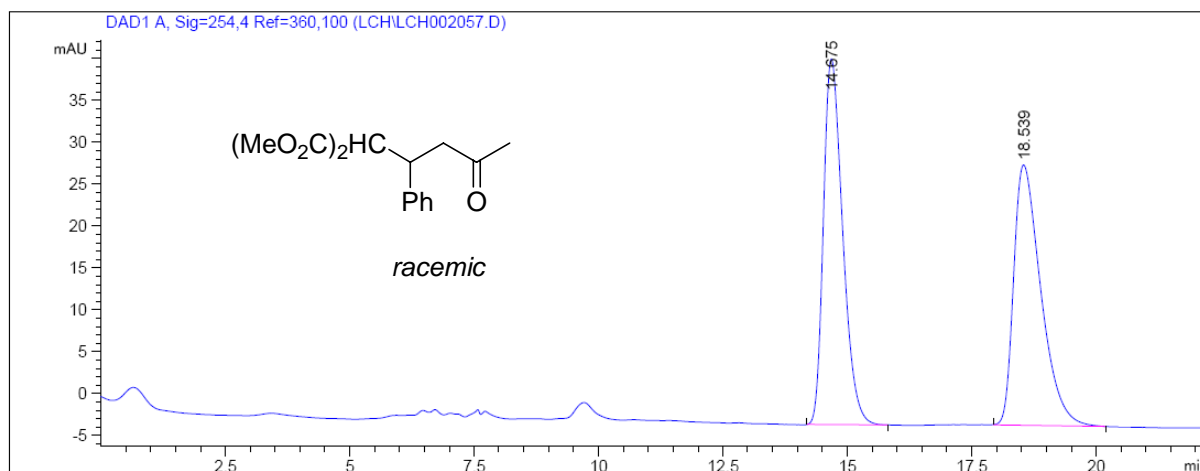


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1	26.645	BB	0.8489	1212.50696	22.20929	50.0466
2	30.956	VB	0.9551	1210.24756	19.63426	49.9534

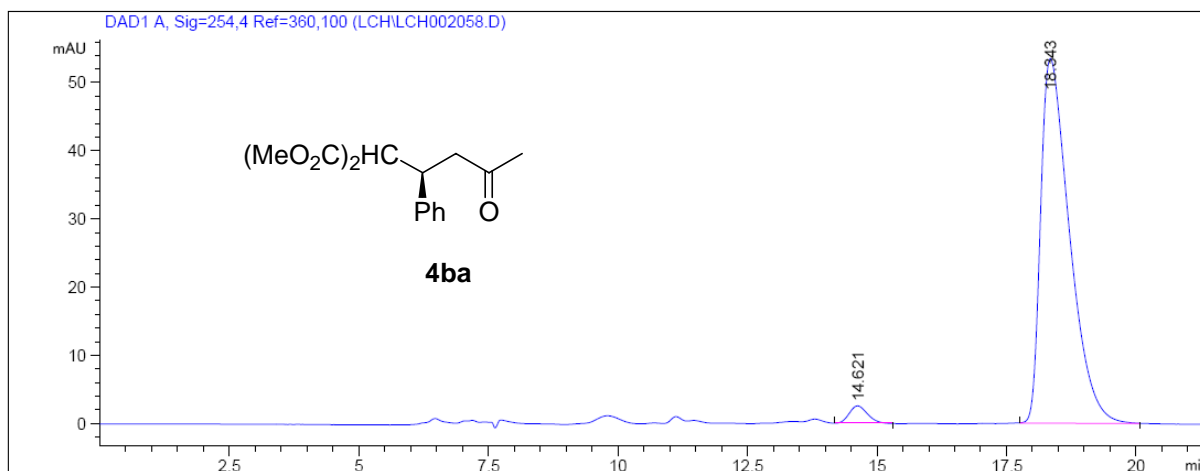


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1	25.757	BB	0.8196	696.21313	13.36892	41.0491
2	29.821	BB	0.9213	999.83459	16.92378	58.9509

HPLC chromatogram for compound **4ba**

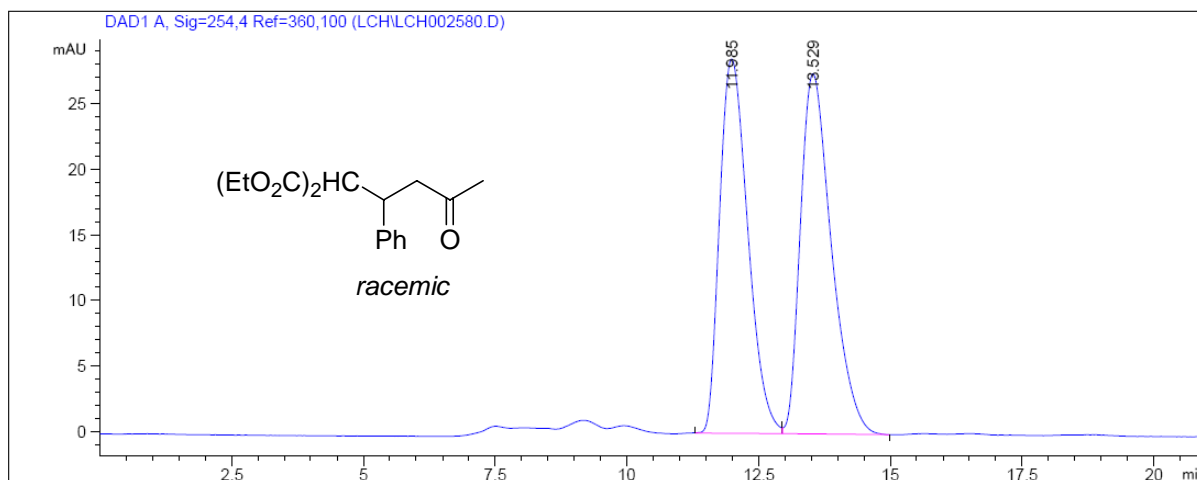


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
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1	14.675	BB	0.4139	1173.74133	43.62328	49.8422
2	18.539	BB	0.5795	1181.17200	31.07176	50.1578

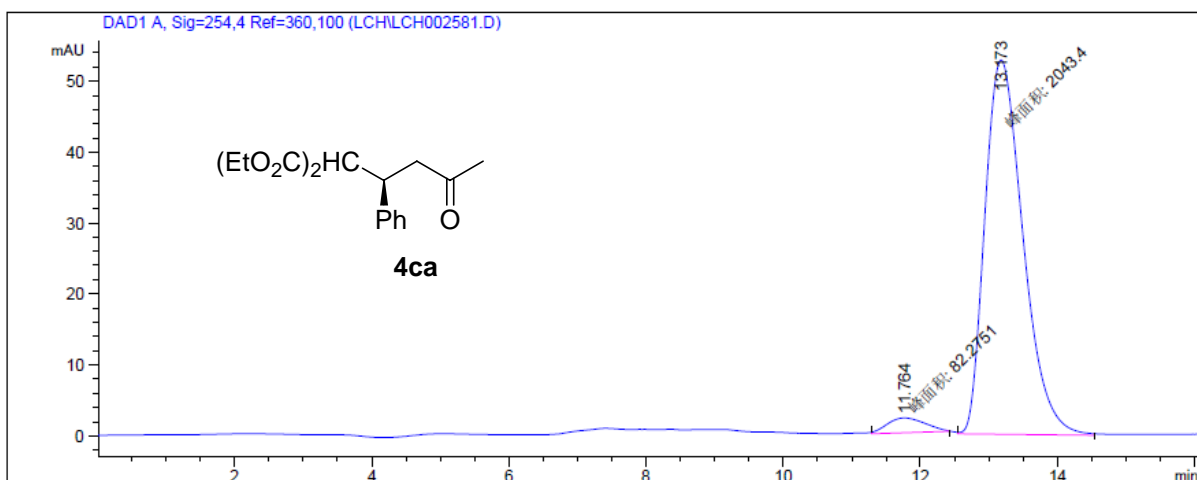


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	14.621	VB	0.3909	64.48955	2.58608	3.0095
2	18.343	BB	0.5886	2078.35791	53.57192	96.9905

HPLC chromatogram for compound **4ca**

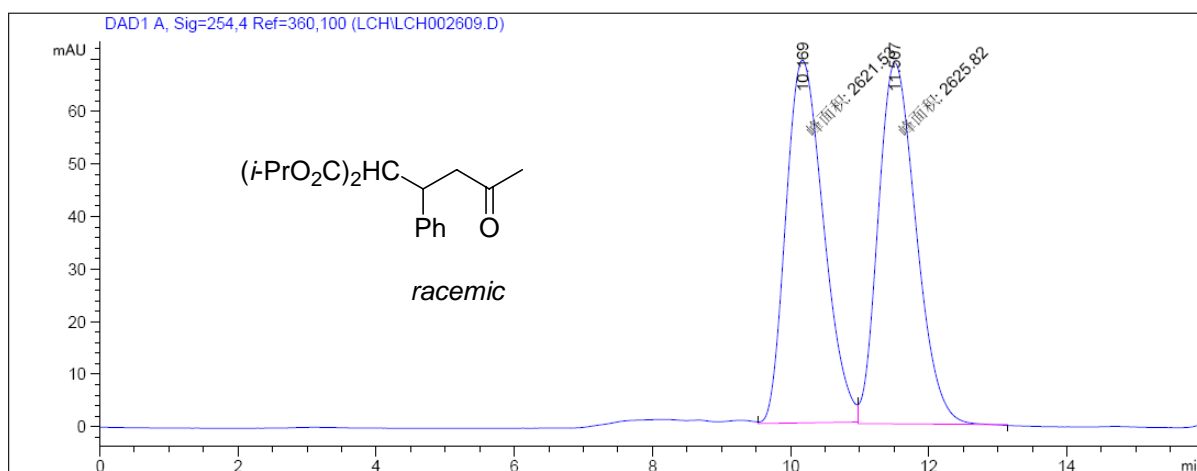


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峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	11.985	BV	0.5909	1064.45325	28.55466	48.6006
2	13.529	VB	0.6221	1125.75159	27.47192	51.3994

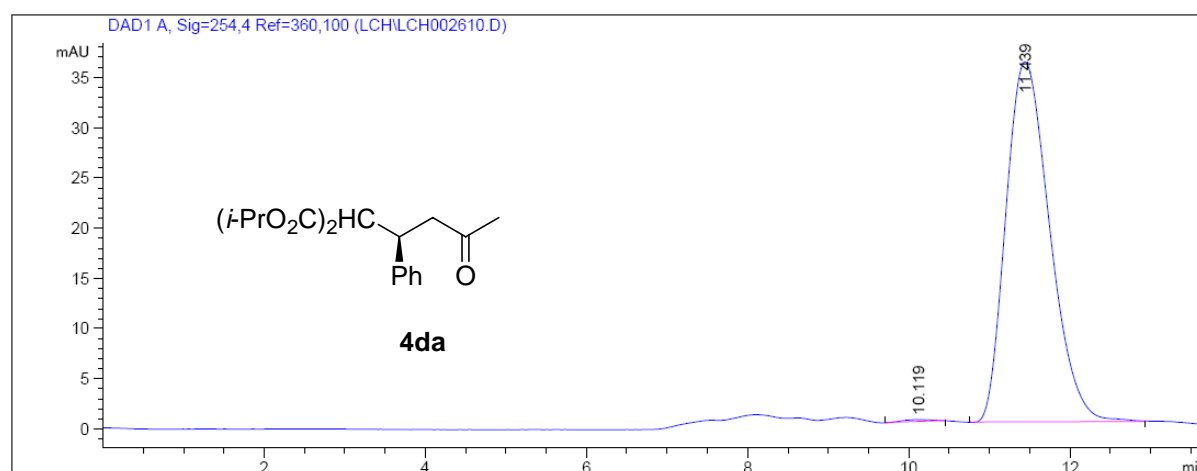


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	11.764	MM	0.6473	82.27506	2.11834	3.8705
2	13.173	MM	0.6445	2043.39551	52.83878	96.1295

HPLC chromatogram for compound **4da**

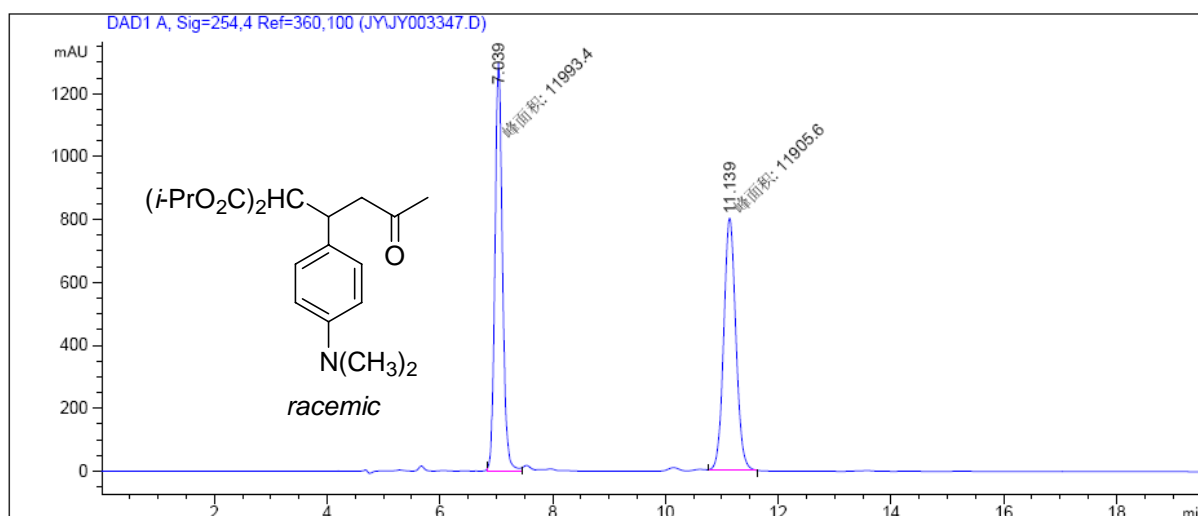


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	10.169	MM	0.6324	2621.52612	69.08685	49.9590
2	11.507	MM	0.6367	2625.82446	68.73947	50.0410

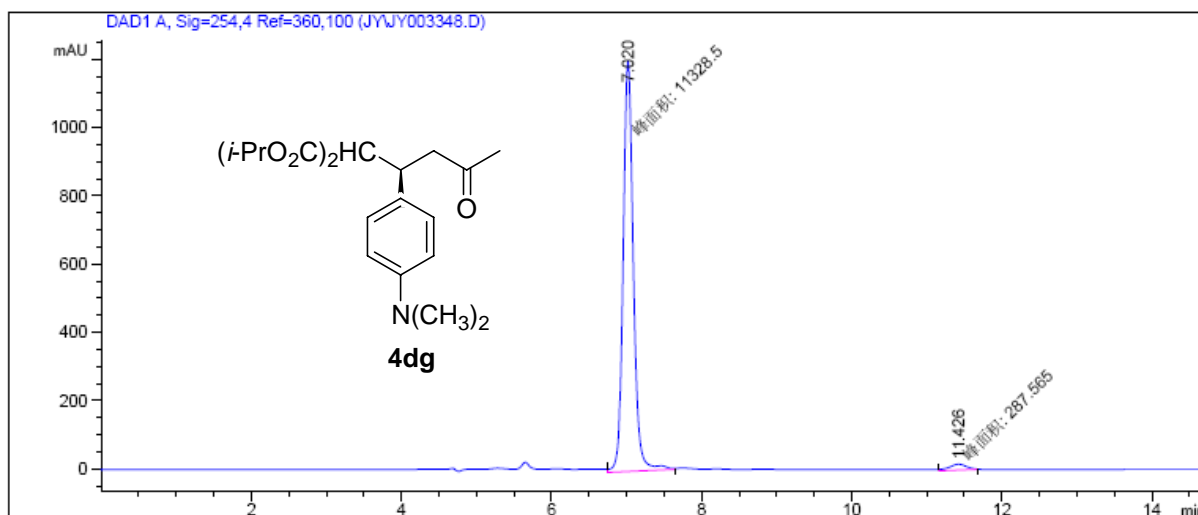


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
峰 #	保留时间 [min]	类型	峰宽 [min]	峰面积 [mAU*s]	峰高 [mAU]	峰面积 %
1	10.119	BB T	0.3556	5.32928	2.02103e-1	0.3913
2	11.439	BB	0.5934	1356.52148	35.85247	99.6087

HPLC chromatogram for compound **4dg**



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.039	MM	0.1536	1.19934e4	1301.46594	50.1838
2	11.139	MM	0.2477	1.19056e4	801.04590	49.8162



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.020	MM	0.1567	1.13285e4	1205.26868	97.5244
2	11.426	MM	0.2749	287.56537	17.43642	2.4756