Supporting Information-II

Asymmetric Synthesis of Tetrahydroquinolines through Supramolecular Organocatalysis

Dhevalapally B. Ramachary,* and Kodambahalli S. Shruthi

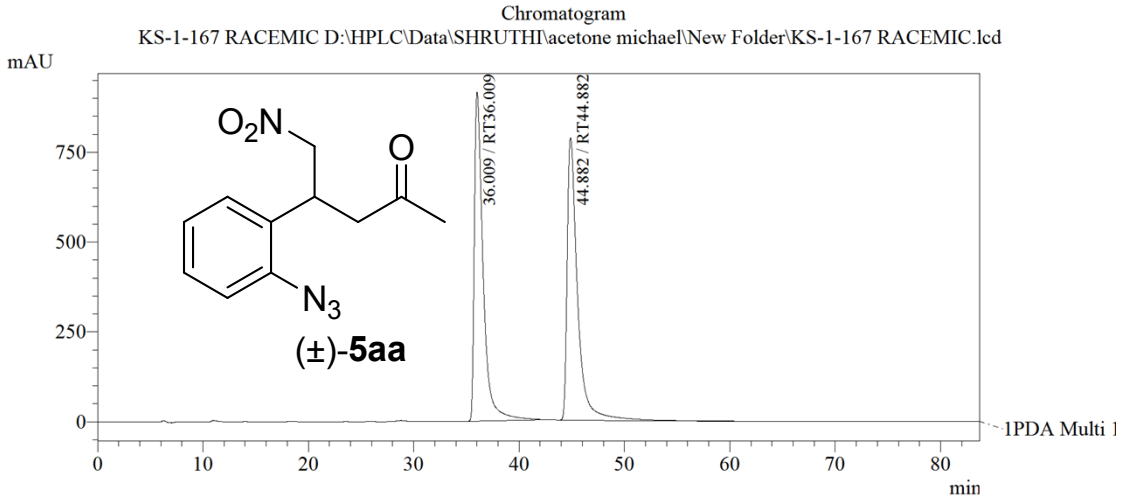
Catalysis Laboratory, School of Chemistry, University of Hyderabad, Central University (P.O.),
Hyderabad 500 046, India

E-mail: ***ramsc@uohyd.ernet.in*** or ***ramchary.db@gmail.com***

General Methods: The ^{1}H NMR and ^{13}C NMR spectra were recorded at 400 MHz and 100 MHz, respectively. The chemical shifts are reported in ppm downfield to TMS ($\delta = 0$) for ^{1}H NMR and relative to the central $CDCl_3$ resonance ($\delta = 77.0$) for ^{13}C NMR. *In the ^{13}C NMR spectra, the nature of the carbons (C, CH, CH_2 or CH_3) was determined by recording the DEPT-135 experiment, and is given in parentheses.* The coupling constants *J* are given in Hz. Column chromatography was performed using Acme's silica gel (particle size 0.063-0.200 mm). High-resolution mass spectra were recorded on micromass ESI-TOF MS. IR spectra were recorded on JASCO FT/IR-5300. Mass spectra were recorded on either VG7070H mass spectrometer using EI technique or Shimadzu-LCMS-2010 A mass spectrometer. The X-ray diffraction measurements were carried out at 298 K on an automated Enraf-Nonious MACH 3 diffractometer using graphite monochromated, Mo-Kα ($\lambda = 0.71073$ Å) radiation with CAD4 software or the X-ray intensity data were measured at 298 K on a Bruker SMART APEX CCD area detector system equipped with a graphite monochromator and a Mo-Kα fine-focus sealed tube ($\lambda =$ 0.71073 Å). For thin-layer chromatography (TLC), silica gel plates Merck 60 F254 were used and compounds were visualized by irradiation with UV light and/or by treatment with a solution of *p*-anisaldehyde (23 mL), conc. H_2SO_4 (35 mL), acetic acid (10 mL), and ethanol (900 mL) followed by heating.

The enantiomeric excess (*ee*) of the Michael products **5**, **6**, **8**, **9**, and **10** was determined by chiral stationary phase HPLC using a Lux 5u Amylose-2 column or Daicel Chiralpak AD-H or Daicel Chiralcel OD-H column and hexane/2-propanol as the eluent or Lux 5u cellulose-2 column and hexane/EtOH as the eluent. Retention times and solvent ratios are indicated in the respective entries.

RACEMIC **5aa:**



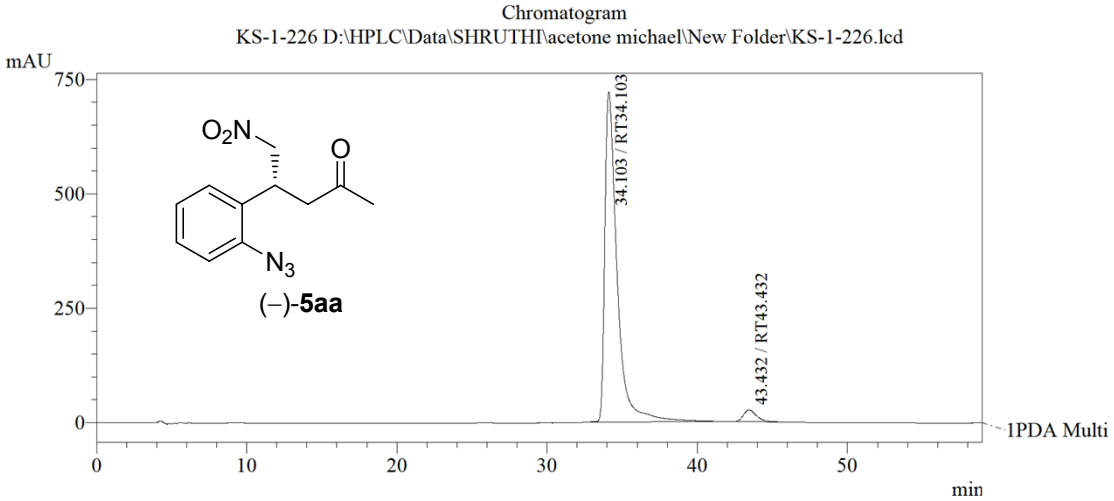
Lux 5u amylose-2, Hexane/ i-PrOH = 90:10, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT36.009	36.009	52966276	914986	49.531	53.804
2	RT44.882	44.882	53969736	785593	50.469	46.196
Total			106936012	1700579	100.000	100.000

CHIRAL **5aa** (**92% *ee***):



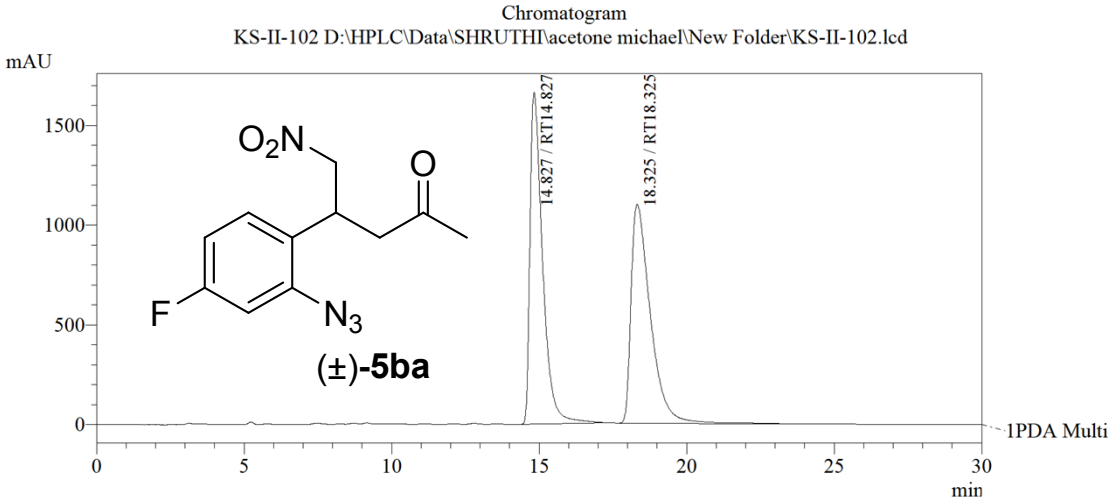
Lux 5u Amylose-2, Hexane/ i-PrOH = 90:10, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT34.103	34.103	41039357	721274	96.231	96.557
2	RT43.432	43.432	1607513	25720	3.769	3.443
Total			42646871	746995	100.000	100.000

RACEMIC **5ba:**



1 PDA Multi 1 / 254nm 4nm

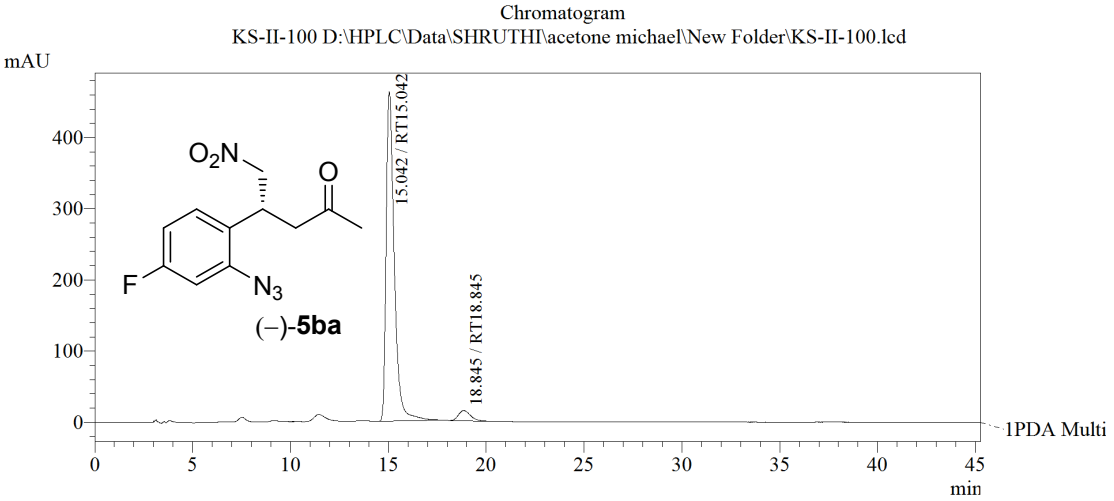
Lux 5u Amylose-2, Hexane/i-PrOH = 90:10, Flow Rate 1.0 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT14.827	14.827	49487996	1662758	49.830	60.244
2	RT18.325	18.325	49825403	1097292	50.170	39.756
Total			99313398	2760050	100.000	100.000

CHIRAL **5ba** (**91% *ee***):



1 PDA Multi 1 / 254nm 4nm

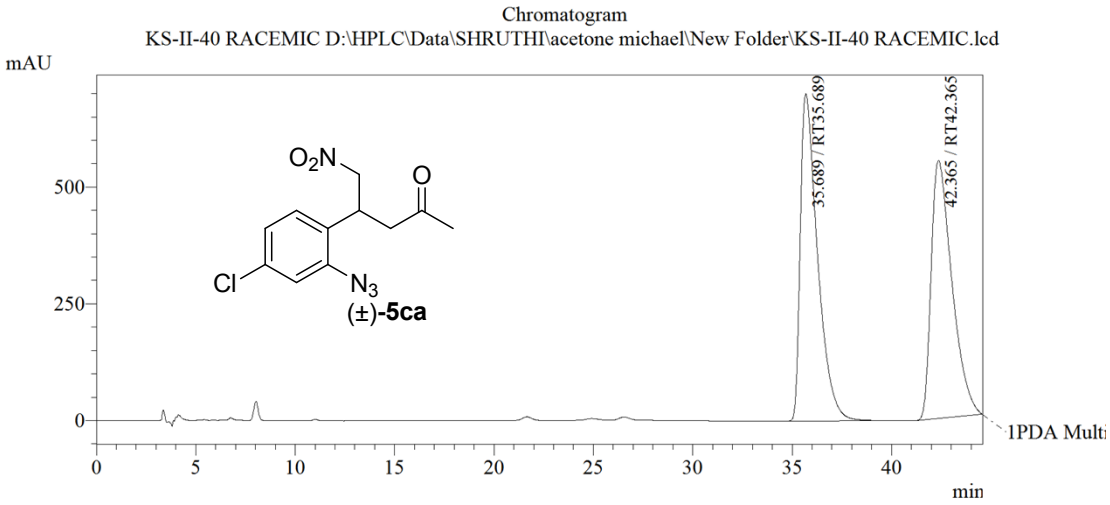
Lux 5u Amylose-2, Hexane/i-PrOH = 90:10, Flow Rate 1.0 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT15.042	15.042	13366211	462666	95.637	96.957
2	RT18.845	18.845	609767	14520	4.363	3.043
Total			13975978	477186	100.000	100.000

RACEMIC **5ca:**



1 PDA Multi 1 / 254nm 4nm

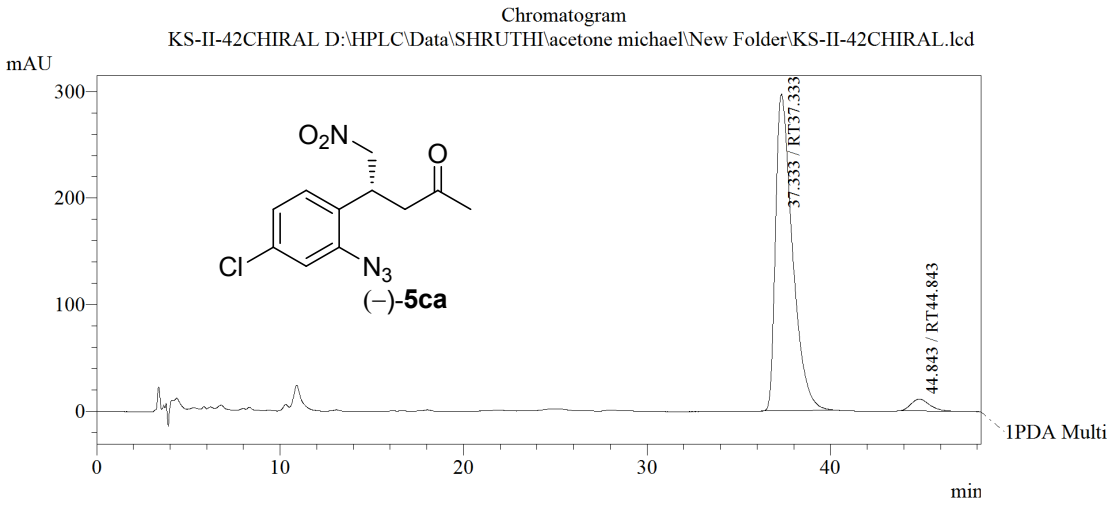
Lux 5u Amylose-2, Hexane/ i-PrOH = 85:15, Flow Rate 1.0 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT35.689	35.689	42300794	700605	51.351	55.911
2	RT42.365	42.365	40075753	552457	48.649	44.089
Total			82376547	1253061	100.000	100.000

CHIRAL **5ca** (**92% *ee***):



1 PDA Multi 1 / 254nm 4nm

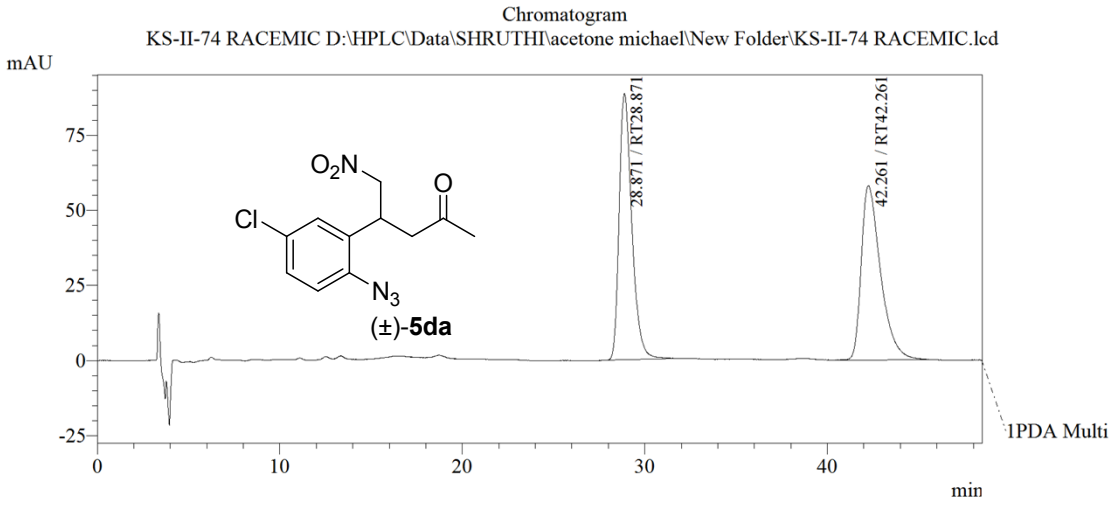
Lux 5u Amylose-2, Hexane/i-PrOH = 85:15, Flow Rate 1.0 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT37.333	37.333	19037343	296685	96.094	96.403
2	RT44.843	44.843	773779	11069	3.906	3.597
Total			19811121	307754	100.000	100.000

RACEMIC **5da:**



1 PDA Multi 1 / 254nm 4nm

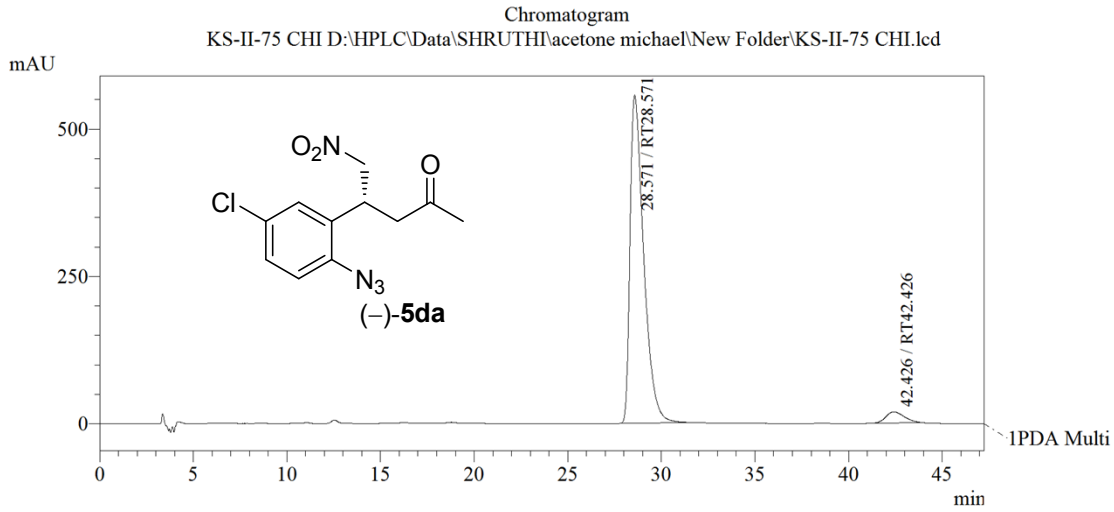
Lux 5u Amylose-2, Hexane/ i-PrOH = 85:15, Flow Rate 1.0 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT28.871	28.871	4270805	88682	49.929	60.452
2	RT42.261	42.261	4282977	58016	50.071	39.548
Total			8553781	146699	100.000	100.000

CHIRAL **5da** (**91% *ee***):



1 PDA Multi 1 / 254nm 4nm

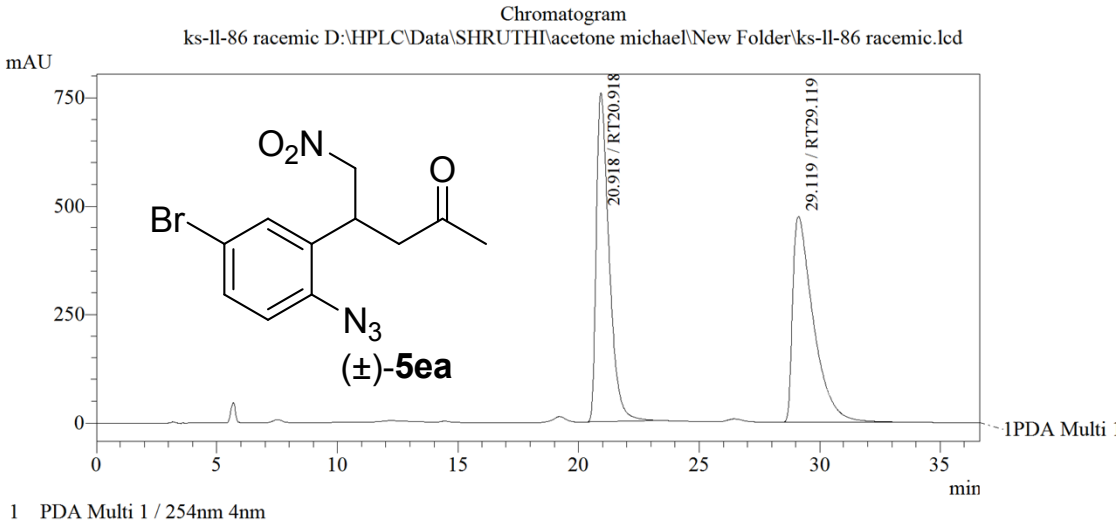
Lux 5u Amylose-2, Hexane/ i-PrOH = 85:15, Flow Rate 1.0 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT28.571	28.571	28250752	556863	95.588	96.709
2	RT42.426	42.426	1304076	18949	4.412	3.291
Total			29554829	575812	100.000	100.000

RACEMIC **5ea:**



1 PDA Multi 1 / 254nm 4nm

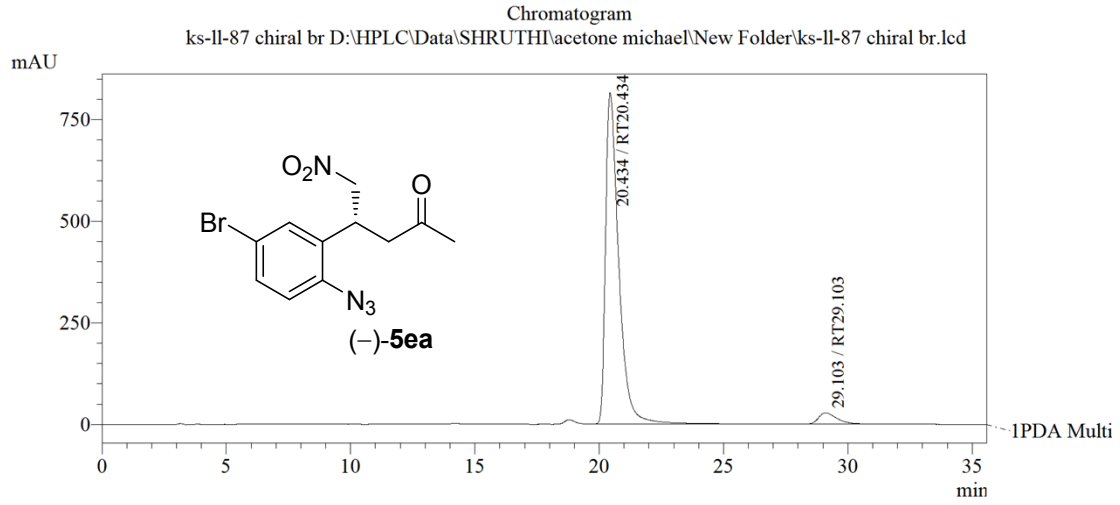
Lux 5u Amylose-2, Hexane/ i-PrOH = 90:10, Flow Rate 1.0 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT20.918	20.918	28050544	758860	49.939	61.523
2	RT29.119	29.119	28119410	474589	50.061	38.477
Total			56169954	1233449	100.000	100.000

CHIRAL **5ea** (**91% *ee***):



1 PDA Multi 1 / 254nm 4nm

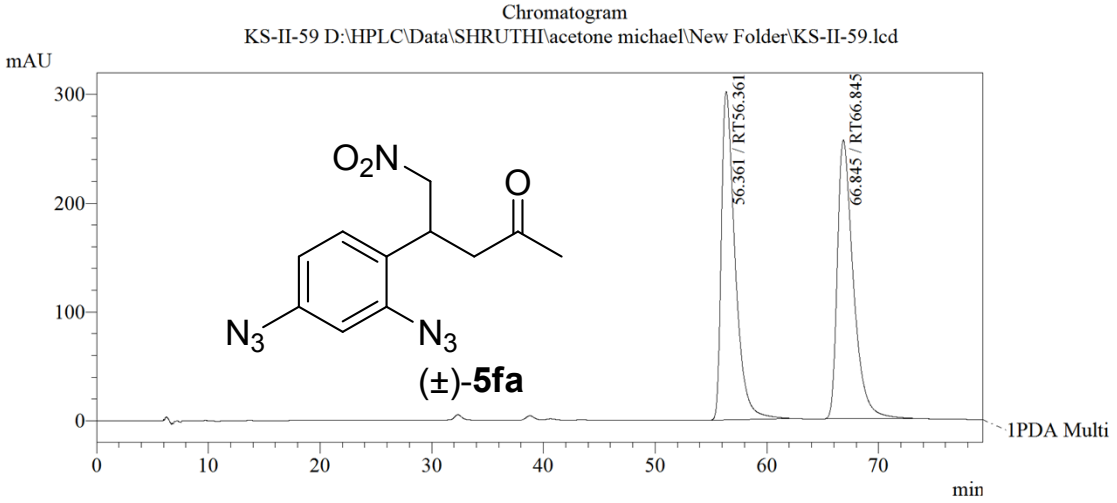
Lux 5u Amylose-2, Hexane/ i-PrOH = 90:10, Flow Rate 1.0 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT20.434	20.434	29959631	815485	95.395	96.717
2	RT29.103	29.103	1446162	27682	4.605	3.283
Total			31405793	843168	100.000	100.000

RACEMIC **5fa:**



1 PDA Multi 1 / 254nm 4nm

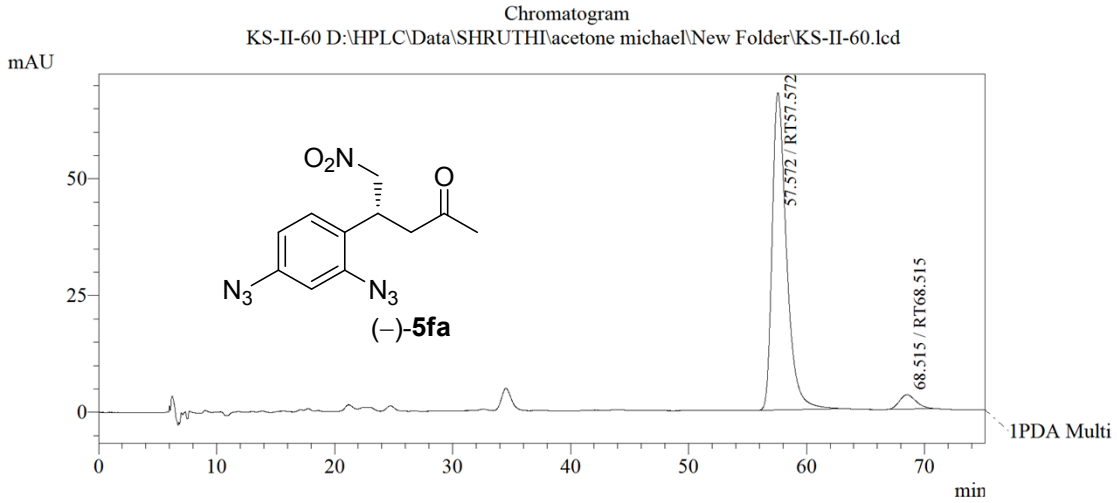
Lux 5u Amylose-2, Hexane/ i-PrOH = 90:10, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT56.361	56.361	25632169	301707	50.204	54.088
2	RT66.845	66.845	25423918	256101	49.796	45.912
Total			51056087	557809	100.000	100.000

CHIRAL **5fa** (**90% *ee***):



1 PDA Multi 1 / 254nm 4nm

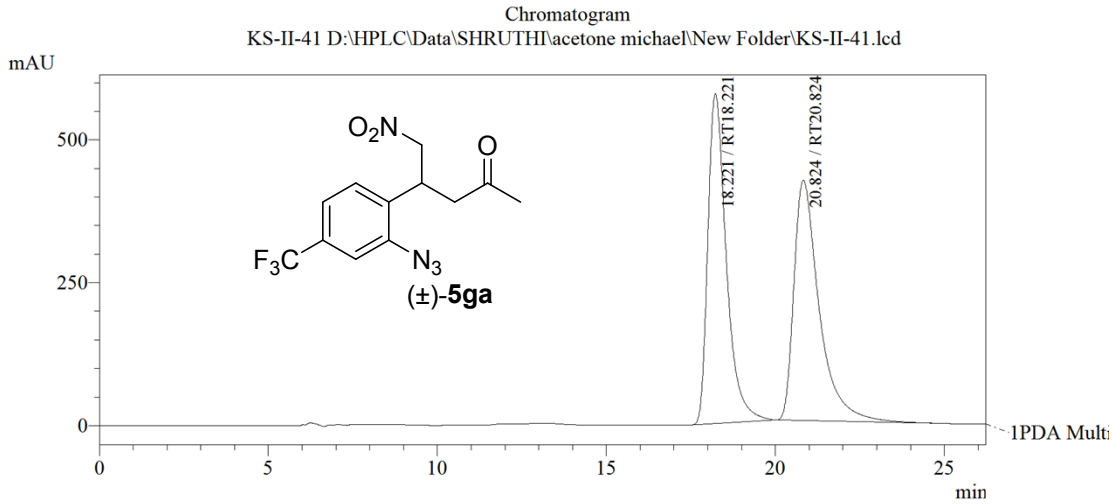
Lux 5u Amylose-2, Hexane/ i-PrOH = 90:10, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT57.572	57.572	5727283	67916	95.020	95.703
2	RT68.515	68.515	300179	3049	4.980	4.297
Total			6027462	70965	100.000	100.000

RACEMIC **5ga:**



1 PDA Multi 1 / 254nm 4nm

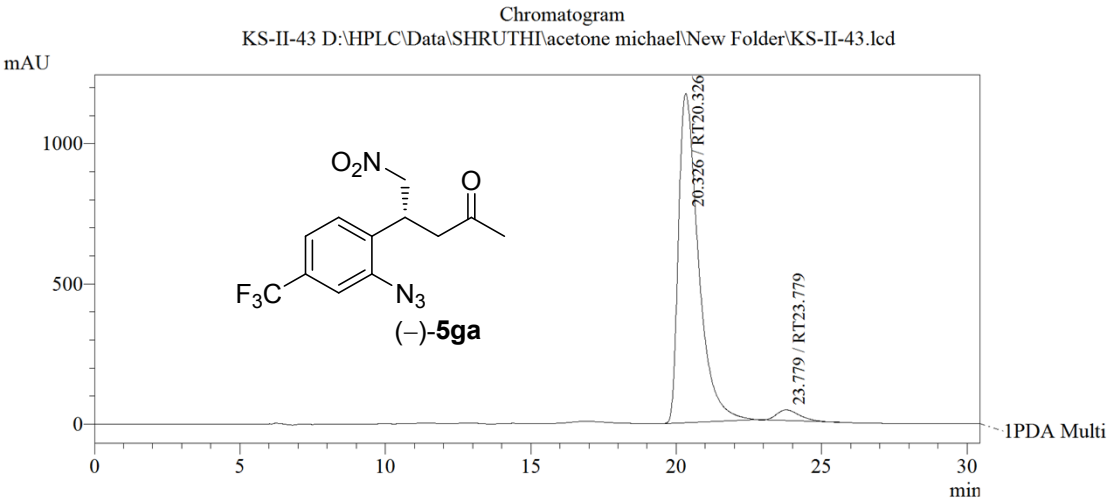
Lux 5u Amylose-2, Hexane/ i- PrOH = 90:10, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT18.221	18.221	21950428	577453	50.032	57.850
2	RT20.824	20.824	21921958	420729	49.968	42.150
Total			43872386	998182	100.000	100.000

CHIRAL **5ga** (**92% *ee***):



1 PDA Multi 1 / 254nm 4nm

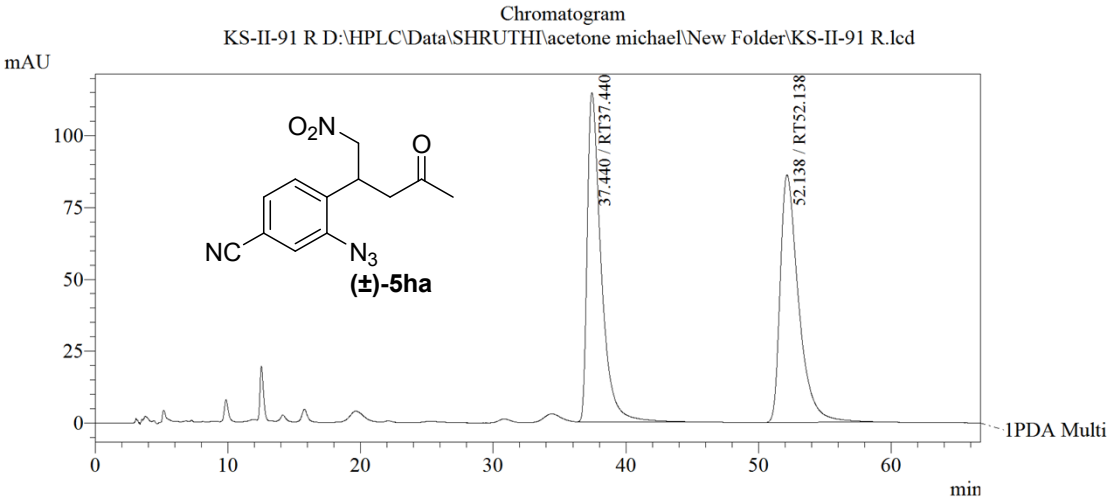
Lux 5u Amylose-2, Hexane/ i- PrOH = 90:10, Flow Rate 0.5 mL/Min, 254

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT20.326	20.326	56100103	1173049	96.299	96.814
2	RT23.779	23.779	2156229	38606	3.701	3.186
Total			58256332	1211654	100.000	100.000

RACEMIC **5ha:**



1 PDA Multi 1 / 254nm 4nm

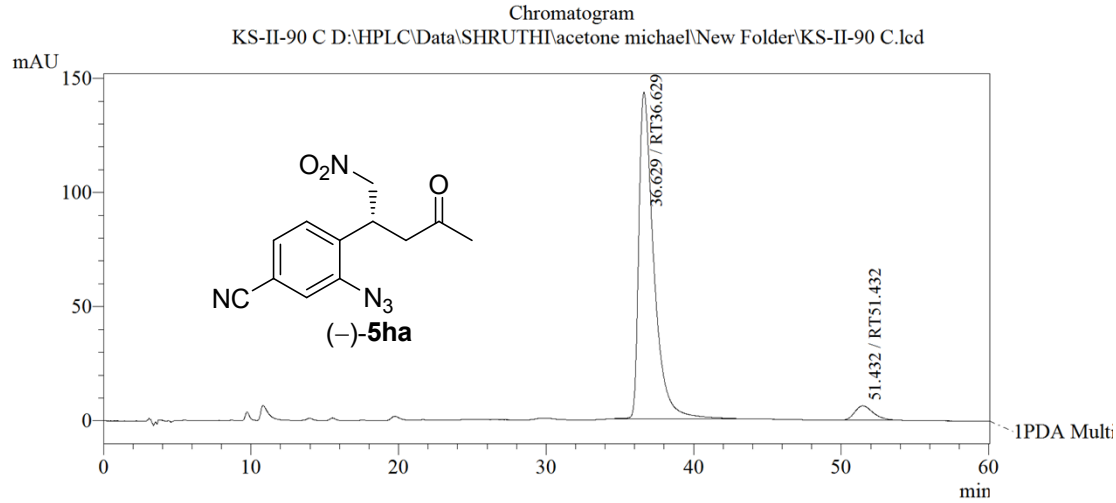
Lux 5u Amylose-2, Hexane/ i-PrOH = 85:15, Flow Rate 1.0 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT37.440	37.440	8319866	114577	50.020	57.079
2	RT52.138	52.138	8313203	86158	49.980	42.921
Total			16633070	200735	100.000	100.000

CHIRAL **5ha** (**89% *ee***):



1 PDA Multi 1 / 254nm 4nm

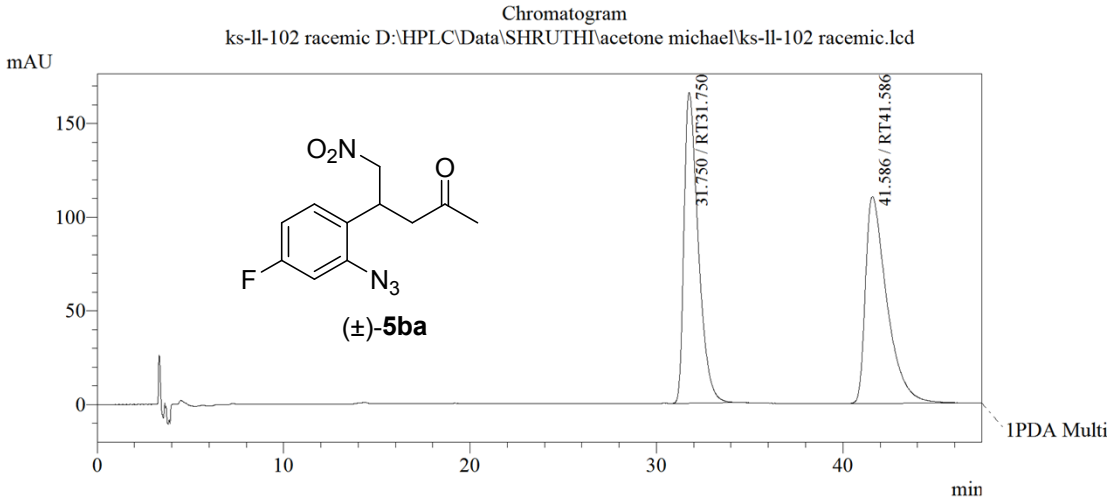
Lux 5u Amylose-2, Hexane/ i-PrOH = 85:15, Flow Rate 1.0 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT36.629	36.629	10121213	143026	94.843	95.771
2	RT51.432	51.432	550382	6316	5.157	4.229
Total			10671595	149342	100.000	100.000

RACEMIC **5ba:**



1 PDA Multi 1 / 254nm 4nm

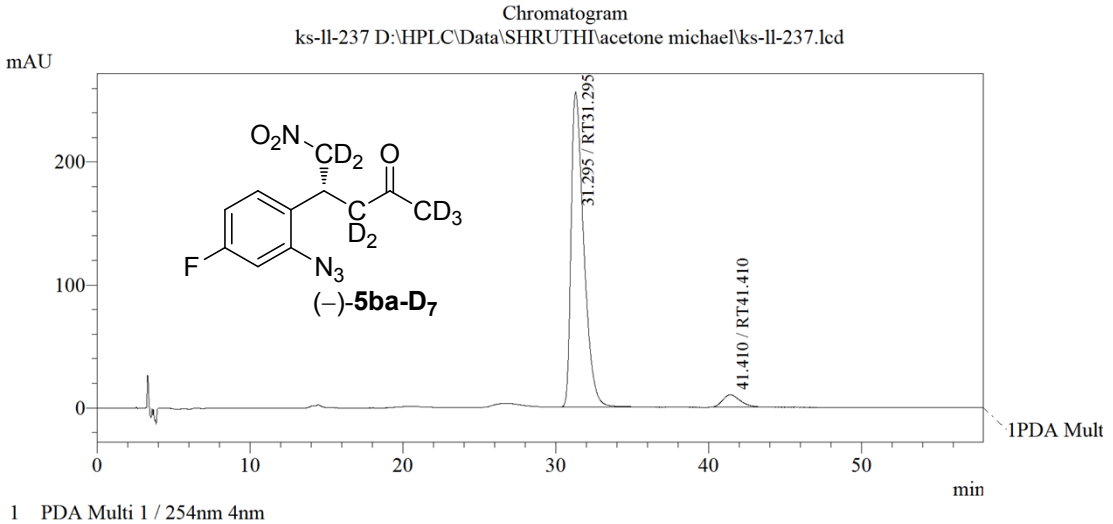
Lux 5u Amylose-2, Hexane/ i-PrOH = 90:10, Flow Rate 1.0 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT31.750	31.750	8794049	165737	49.976	60.022
2	RT41.586	41.586	8802478	110388	50.024	39.978
Total			17596527	276125	100.000	100.000

CHIRAL **5ba-D$_7$** (**89% *ee***):



1 PDA Multi 1 / 254nm 4nm

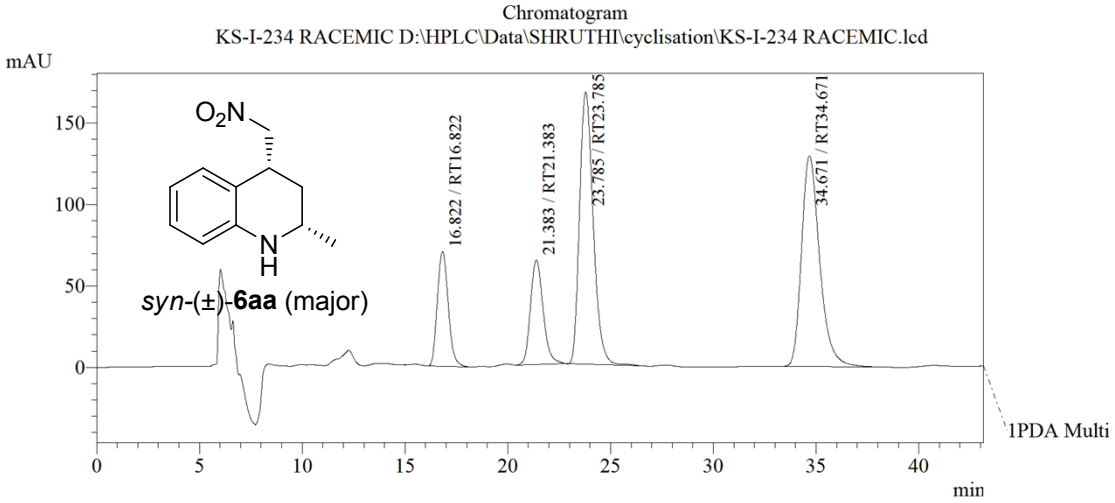
Lux 5u Amylose-2, Hexane/ i-PrOH = 90:10, Flow Rate 1.0 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT31.295	31.295	14738981	256077	94.733	96.199
2	RT41.410	41.410	819474	10119	5.267	3.801
Total			15558454	266196	100.000	100.000

RACEMIC *syn*-(±)-**6aa** and *anti*-(±)-**6aa:**



1 PDA Multi 1 / 254nm 4nm

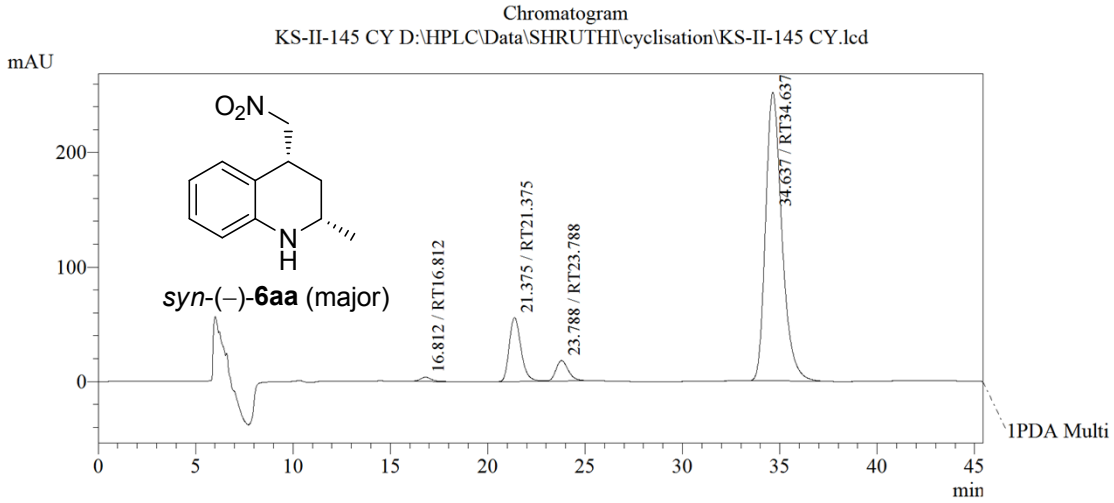
Daicel Chiralpak AD-H, Hexane/ i-PrOH = 95:5, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT16.822	16.822	2591579	70295	12.347	16.323
2	RT21.383	21.383	2748496	64000	13.094	14.861
3	RT23.785	23.785	7717208	167076	36.767	38.795
4	RT34.671	34.671	7932421	129293	37.792	30.022
Total			20989704	430664	100.000	100.000

CHIRAL *syn*-(−)-**6aa** (**90% *ee***) and *anti*-(−)-**6aa** (**89% *ee***):



1 PDA Multi 1 / 254nm 4nm

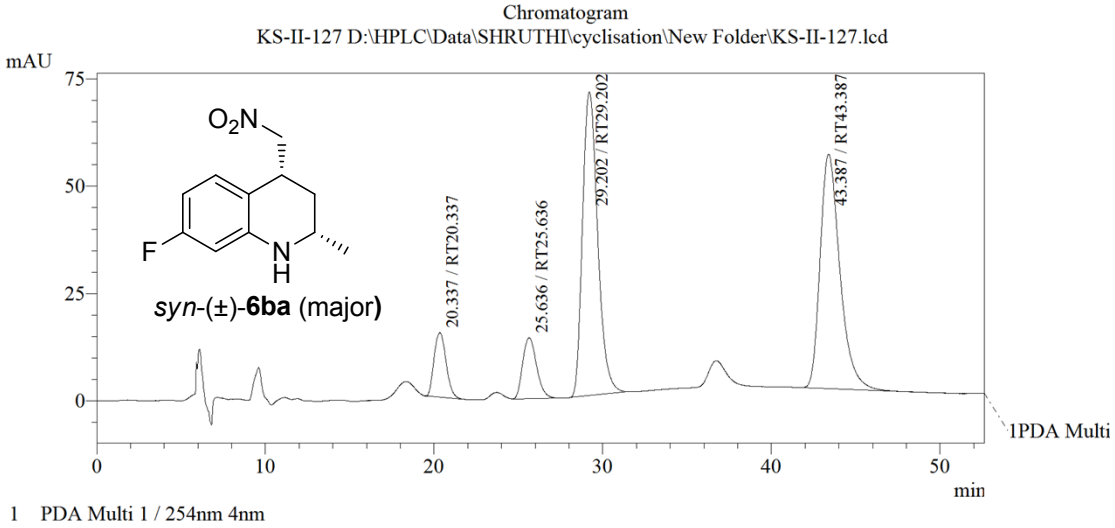
Daicel Chiralpak AD-H, Hexane/ i- PrOH = 95:5, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT16.812	16.812	127734	3435	0.711	1.044
2	RT21.375	21.375	2344797	55755	13.049	16.948
3	RT23.788	23.788	796039	17885	4.430	5.436
4	RT34.637	34.637	14699980	251910	81.809	76.572
Total			17968550	328985	100.000	100.000

RACEMIC *syn*-(±)-**6ba** and *anti*-(±)-**6ba**:



1 PDA Multi 1 / 254nm 4nm

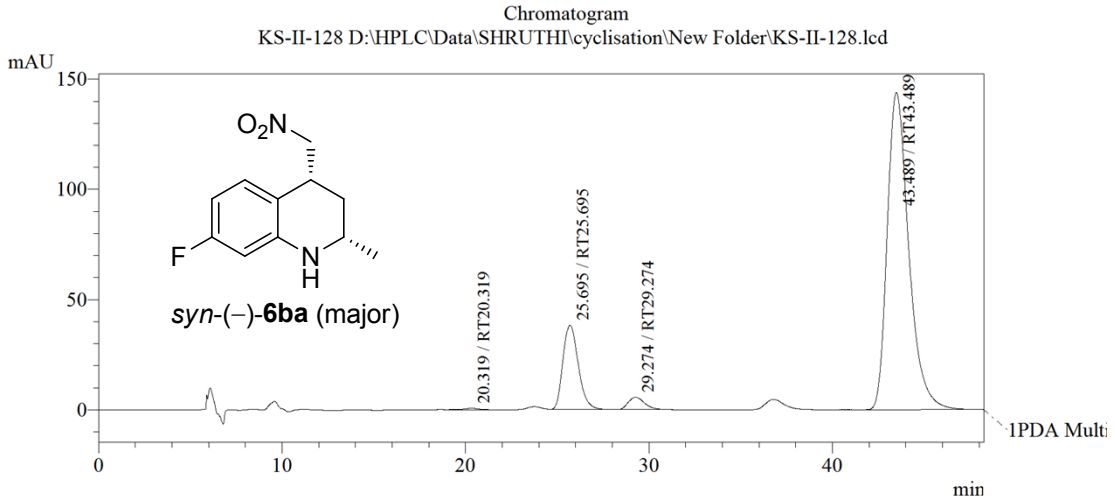
Daicel Chiralpak AD-H, Hexane/ i- PrOH = 95:5, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT20.337	20.337	744530	15003	7.135	9.699
2	RT25.636	25.636	814211	14184	7.803	9.170
3	RT29.202	29.202	4416413	70797	42.322	45.771
4	RT43.387	43.387	4460030	54694	42.740	35.360
Total			10435185	154677	100.000	100.000

CHIRAL *syn*-(−)-**6ba** (**94% *ee***) and *anti*-(−)-**6ba** (**97% *ee***):



1 PDA Multi 1 / 254nm 4nm

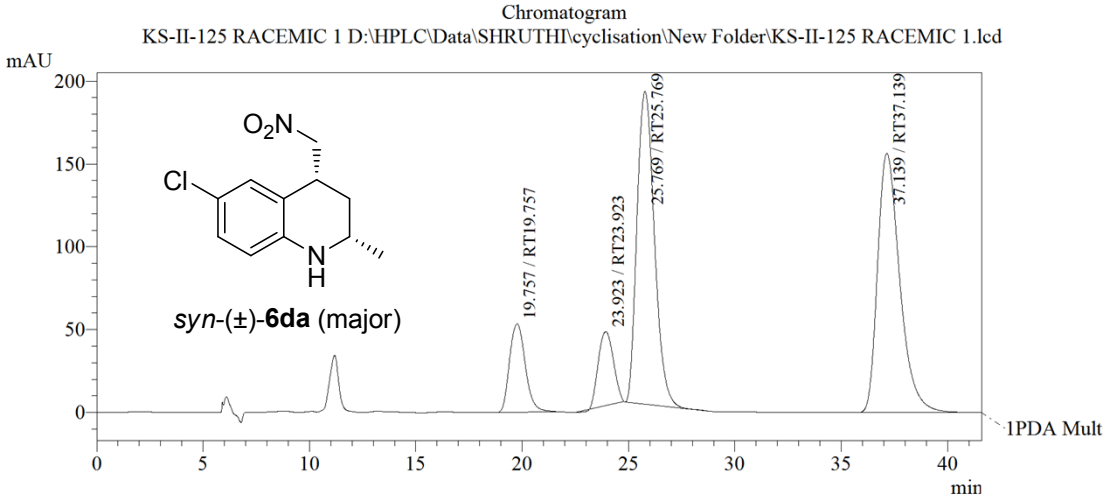
Daicel Chiralpak AD-H, Hexane/ i-PrOH = 95:5, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT20.319	20.319	35744	620	0.249	0.330
2	RT25.695	25.695	2227131	38133	15.507	20.258
3	RT29.274	29.274	348689	5604	2.428	2.977
4	RT43.489	43.489	11750797	143878	81.817	76.435
Total			14362360	188236	100.000	100.000

RACEMIC *syn*-(±)-**6da** and *anti*-(±)-**6da:**



1 PDA Multi 1 / 254nm 4nm

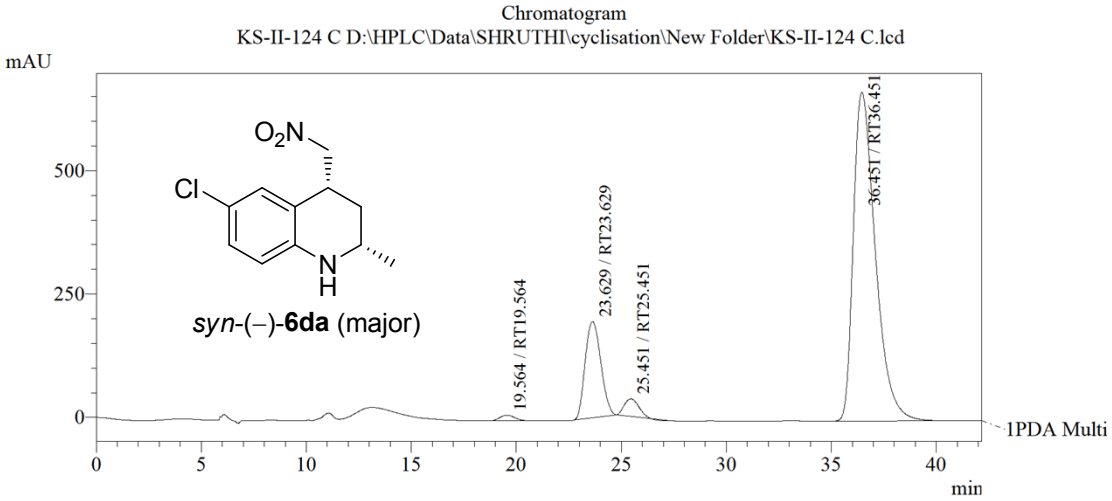
Daicel Chiralpak AD-H, Hexane/ i-PrOH = 95:5, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT19.757	19.757	2766675	53398	10.210	12.042
2	RT23.923	23.923	2209304	44794	8.153	10.101
3	RT25.769	25.769	10763129	188842	39.720	42.585
4	RT37.139	37.139	11358459	156413	41.917	35.272
Total			27097567	443448	100.000	100.000

CHIRAL *syn*-(−)-**6da** (**93% *ee***) and *anti*-(−)-**6da** (**90% *ee***):



1 PDA Multi 1 / 254nm 4nm

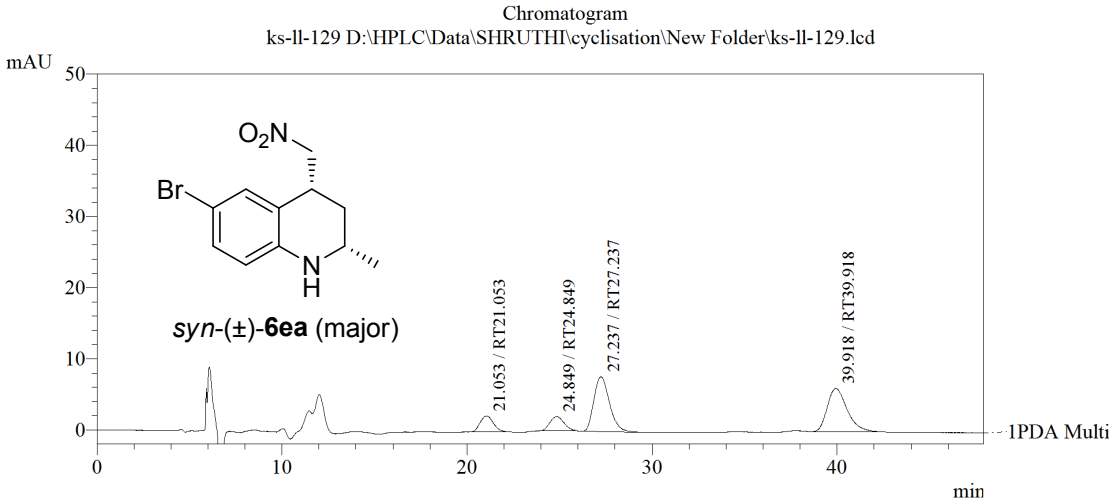
Daicel Chiralpak AD-H, Hexane/ i- PrOH = 95:5, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT19.564	19.564	503595	10782	0.827	1.188
2	RT23.629	23.629	10130989	194923	16.632	21.485
3	RT25.451	25.451	1670241	35259	2.742	3.886
4	RT36.451	36.451	48606886	666283	79.799	73.440
Total			60911710	907248	100.000	100.000

RACEMIC *syn*-(±)-**6ea** and *anti*-(±)-**6ea**:



1 PDA Multi 1 / 254nm 4nm

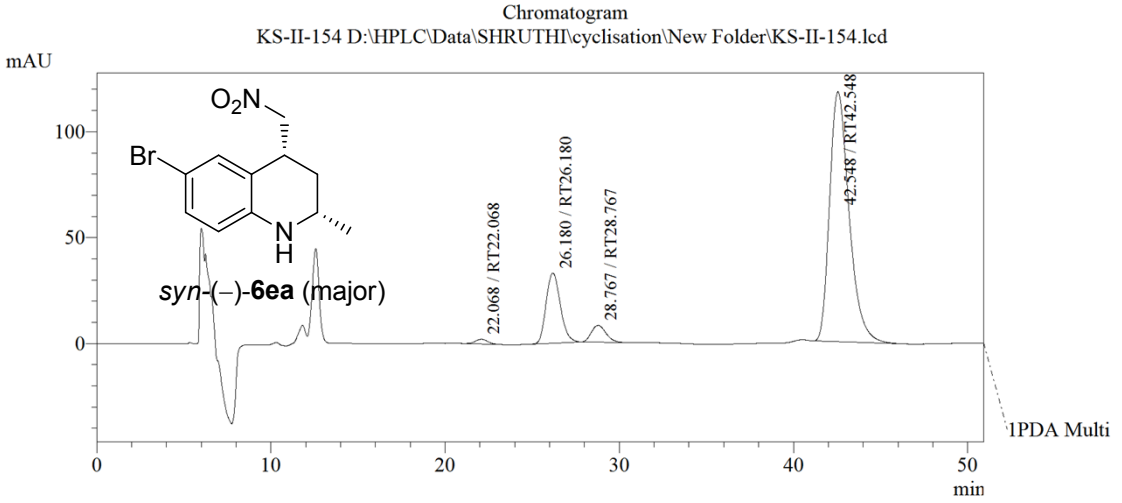
Daicel Chiralpak AD-H, Hexane/ i-PrOH = 95:5, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT21.053	21.053	112305	2243	10.021	12.452
2	RT24.849	24.849	104572	1983	9.331	11.013
3	RT27.237	27.237	449766	7705	40.131	42.782
4	RT39.918	39.918	454090	6079	40.517	33.753
Total			1120732	18011	100.000	100.000

CHIRAL *syn*-(−)-**6ea** (**90% *ee***) and *anti*-(−)-**6ea** (**89% *ee***):



1 PDA Multi 1 / 254nm 4nm

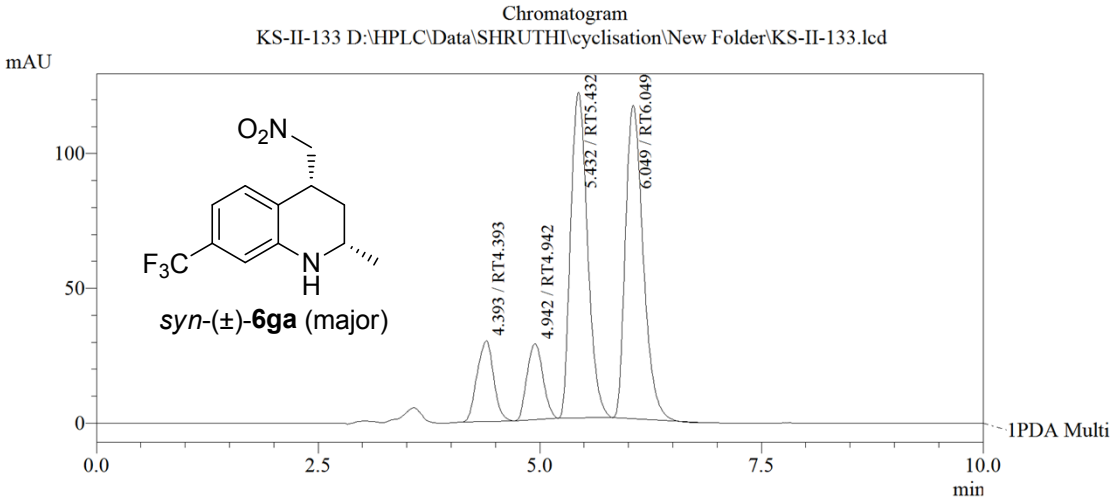
Daicel Chiralpak AD-H, Hexane/ i-PrOH = 95:5, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT22.068	22.068	105617	2177	0.906	1.350
2	RT26.180	26.180	1890835	33100	16.221	20.522
3	RT28.767	28.767	463863	7918	3.979	4.909
4	RT42.548	42.548	9196348	118094	78.893	73.219
Total			11656663	161289	100.000	100.000

RACEMIC *syn*-(±)-**6ga** and *anti*-(±)-**6ga:**



1 PDA Multi 1 / 254nm 4nm

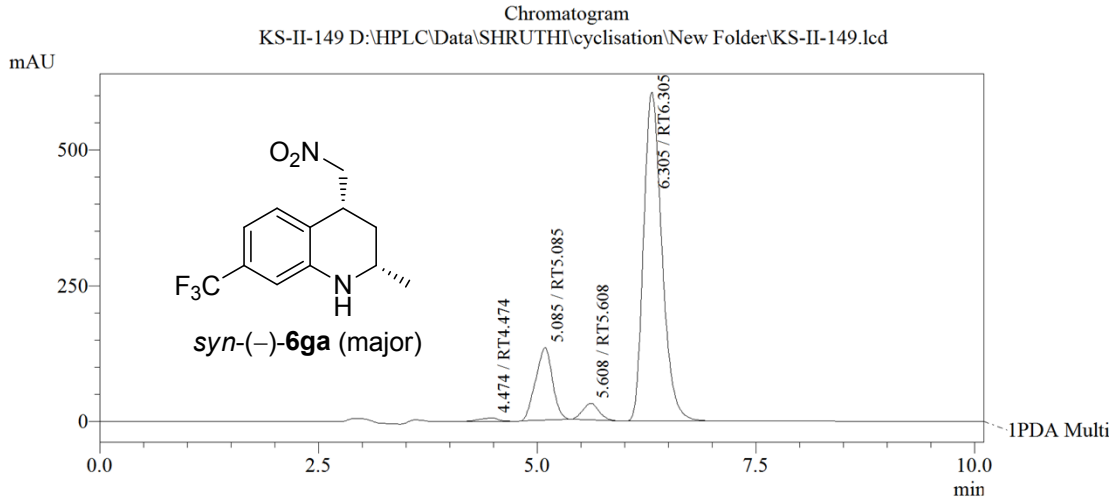
Daicel Chiralpak AD-H, Hexane/ i-PrOH = 80:20, Flow Rate 1.0 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT4.393	4.393	390467	29967	9.847	10.156
2	RT4.942	4.942	353213	28208	8.908	9.560
3	RT5.432	5.432	1601705	120709	40.394	40.909
4	RT6.049	6.049	1619815	116182	40.851	39.375
Total			3965199	295066	100.000	100.000

CHIRAL *syn*-(−)-**6ga** (**91% *ee***) and *anti*-(−)-**6ga** (**90% *ee***):



1 PDA Multi 1 / 254nm 4nm

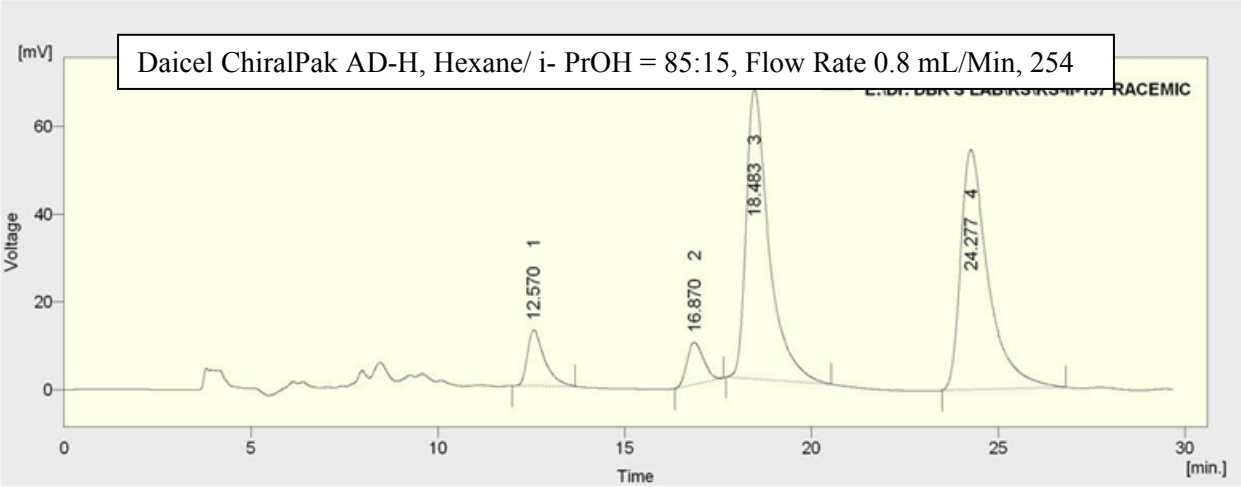
Daicel Chiralpak AD-H, Hexane/ i- PrOH = 80:20, Flow Rate 1.0 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT4.474	4.474	88378	6222	0.797	0.801
2	RT5.085	5.085	1799685	134265	16.233	17.286
3	RT5.608	5.608	396471	30635	3.576	3.944
4	RT6.305	6.305	8802305	605586	79.394	77.968
Total			11086839	776708	100.000	100.000

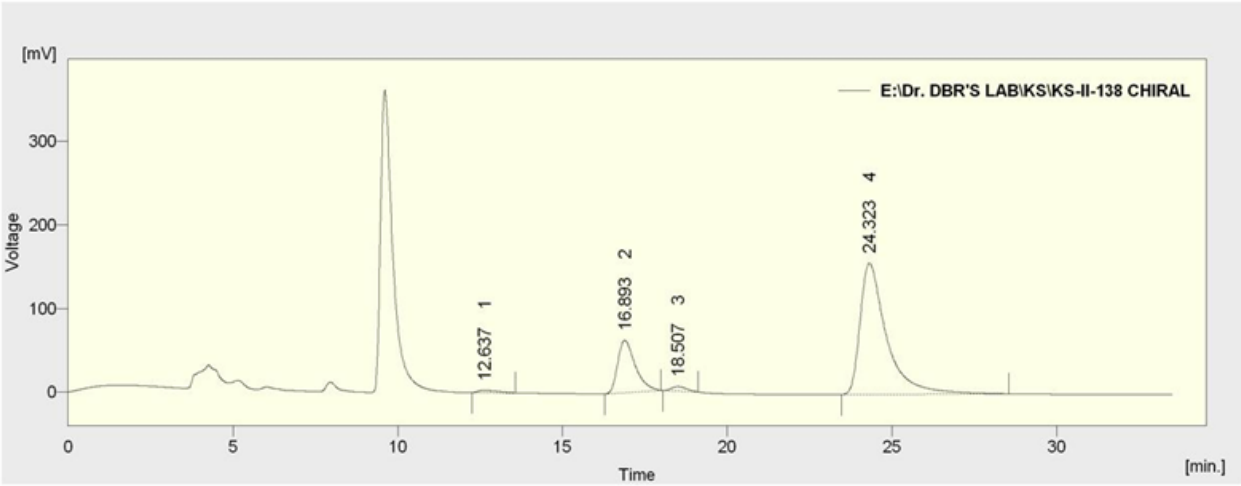
RACEMIC *syn*-(±)-**6ha** and *anti*-(±)-**6ha:**



Result Table (Uncal - E:\Dr. DBR'S LAB\KS\KS-II-137 RACEMIC)

	Reten. Time [min]	Area [mV.s]	Height [mV]	Area [%]	Height [%]	W05 [min]
1	12.570	403.470	12.695	6.4	8.9	0.47
2	16.870	291.212	9.534	4.6	6.7	0.50
3	18.483	2800.659	66.104	44.5	46.2	0.60
4	24.277	2802.509	54.627	44.5	38.2	0.73
	Total	6297.850	142.960	100.0	100.0	

CHIRAL *syn*-(−)-**6ha** (**96% *ee***) and *anti*-(−)-**6ha** (**91% *ee***):

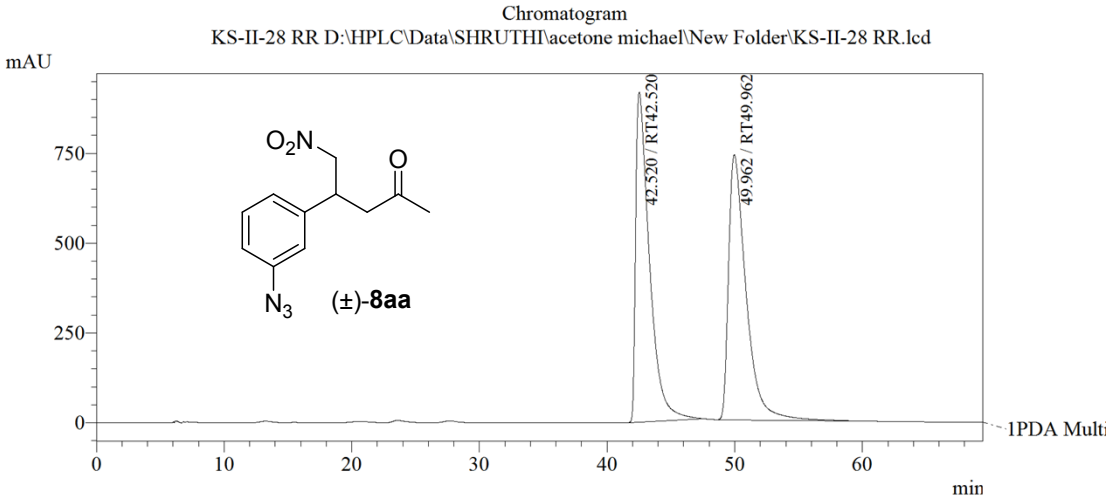


Daicel Chiralpak AD-H, Hexane/ i- PrOH = 85:15, Flow Rate 0.8 mL/Min, 254 nm

Result Table (Uncal - E:\Dr. DBR'S LAB\KS\KS-II-138 CHIRAL)

	Reten. Time [min]	Area [mV.s]	Height [mV]	Area [%]	Height [%]	W05 [min]
1	12.637	113.650	2.747	1.0	1.2	0.67
2	16.893	2311.129	62.545	20.3	27.5	0.57
3	18.507	170.462	5.434	1.5	2.4	0.50
4	24.323	8772.421	156.978	77.2	68.9	0.77
	Total	11367.661	227.704	100.0	100.0	

RACEMIC **8aa:**



1 PDA Multi 1 / 254nm 4nm

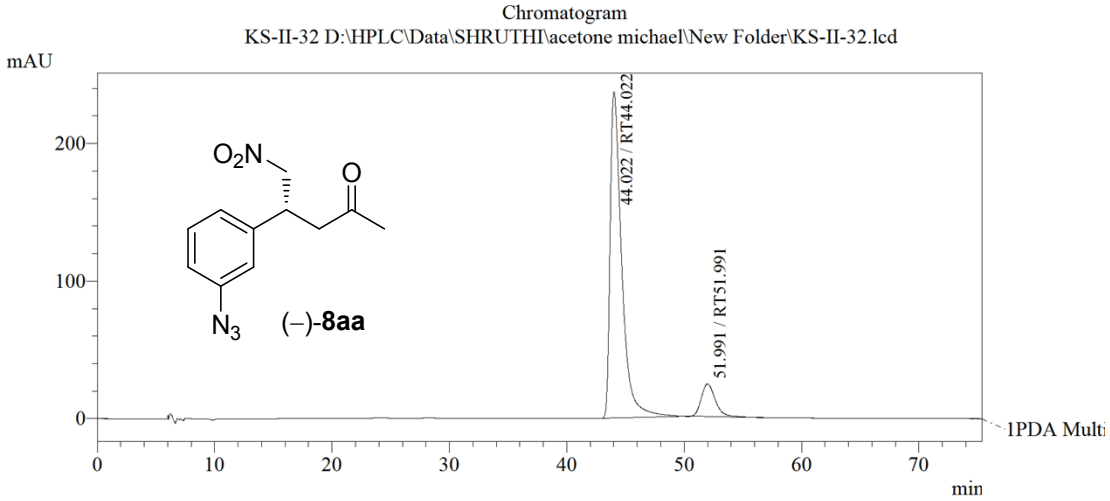
Lux 5u Amylose-2, Hexane/ i-PrOH = 90:10, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT42.520	42.520	68907012	918185	49.477	55.446
2	RT49.962	49.962	70365034	737826	50.523	44.554
Total			139272046	1656011	100.000	100.000

CHIRAL **8aa** (**78.0% *ee***):



1 PDA Multi 1 / 254nm 4nm

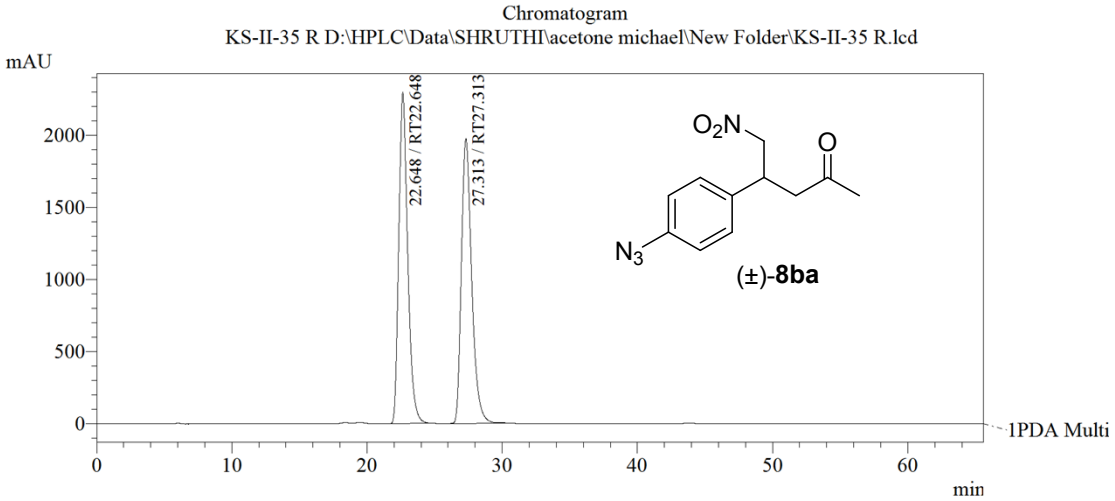
Lux 5u Amylose-2, Hexane/ i-PrOH = 90:10, Flow Rate 0.5 mL/Min, 254

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT44.022	44.022	16307638	237241	89.093	90.905
2	RT51.991	51.991	1996392	23736	10.907	9.095
Total			18304030	260977	100.000	100.000

RACEMIC **8ba:**



1 PDA Multi 1 / 254nm 4nm

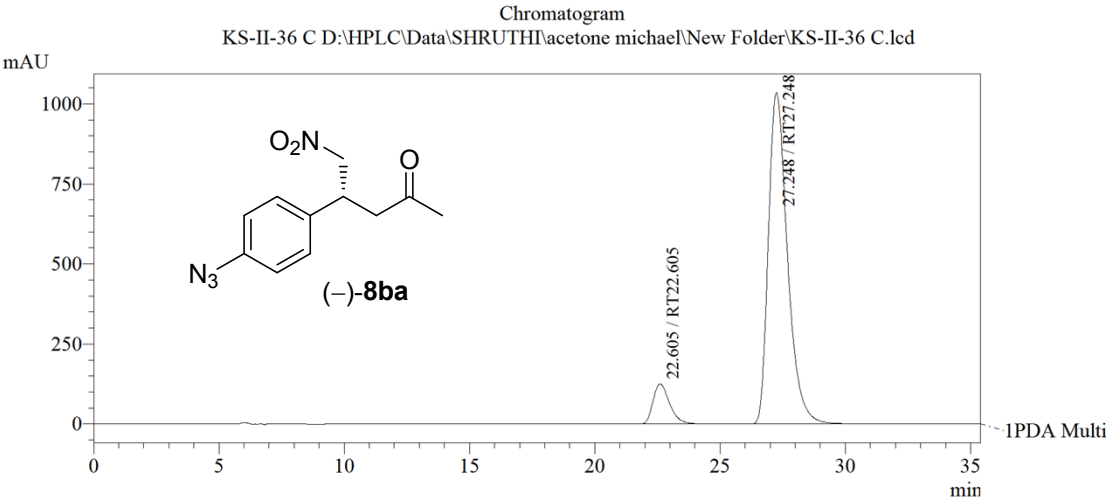
Daicel Chiralpak AD-H, Hexane/ i-PrOH = 90:10, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT22.648	22.648	105305554	2297863	50.273	53.799
2	RT27.313	27.313	104162259	1973338	49.727	46.201
Total			209467812	4271201	100.000	100.000

CHIRAL **8ba** (**81% *ee***):



1 PDA Multi 1 / 254nm 4nm

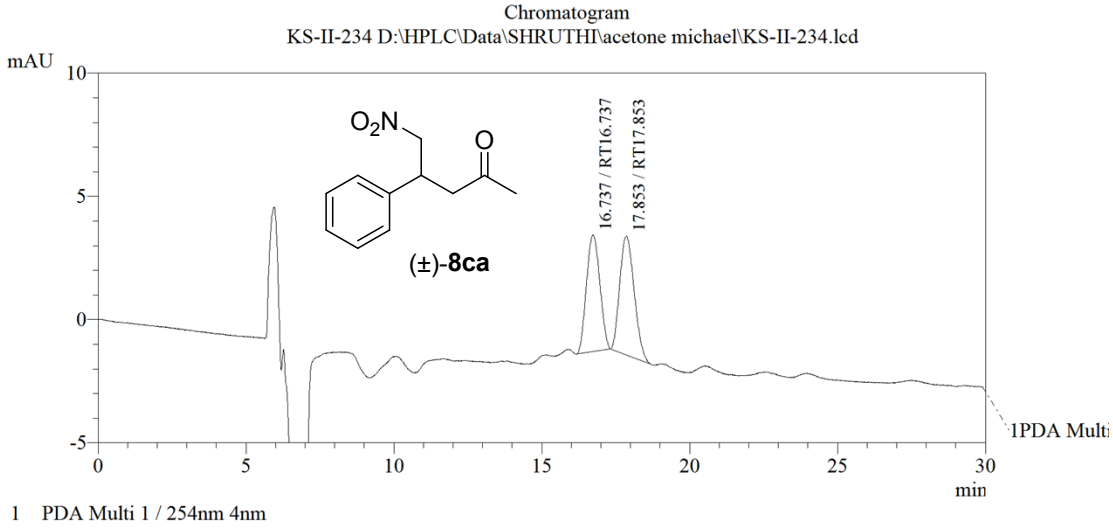
Daicel Chiralpak AD-H, Hexane/ i- PrOH = 90:10, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT22.605	22.605	5743395	125201	9.500	10.794
2	RT27.248	27.248	54714167	1034699	90.500	89.206
Total			60457562	1159901	100.000	100.000

RACEMIC **8ca:**



1 PDA Multi 1 / 254nm 4nm

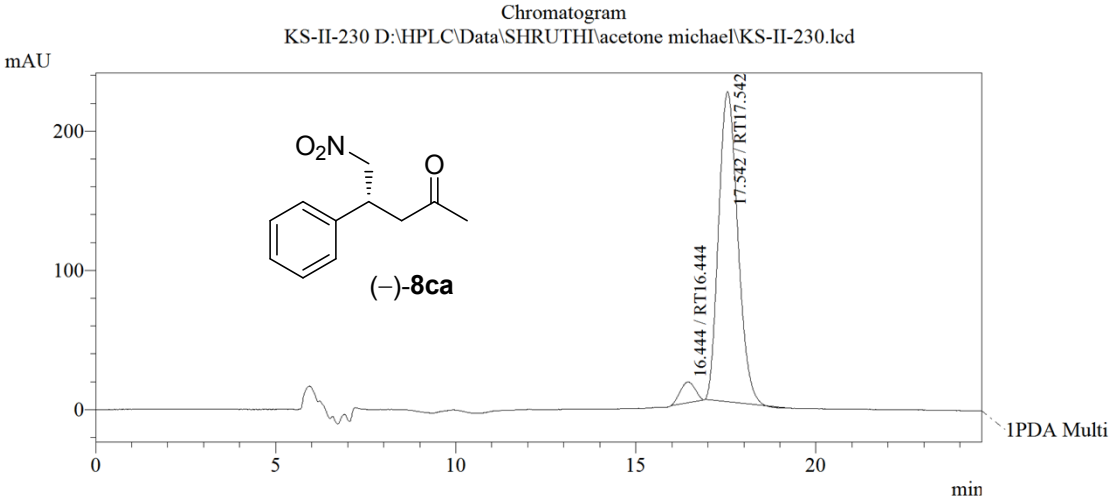
Daicel Chiralpak AD-H, Hexane/ i-PrOH = 90:10, Flow Rate 0.5 mL/Min, 254

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT16.737	16.737	148726	4718	47.483	49.424
2	RT17.853	17.853	164496	4828	52.517	50.576
Total			313222	9546	100.000	100.000

CHIRAL **8ca** (**90% *ee***):



1 PDA Multi 1 / 220nm 4nm

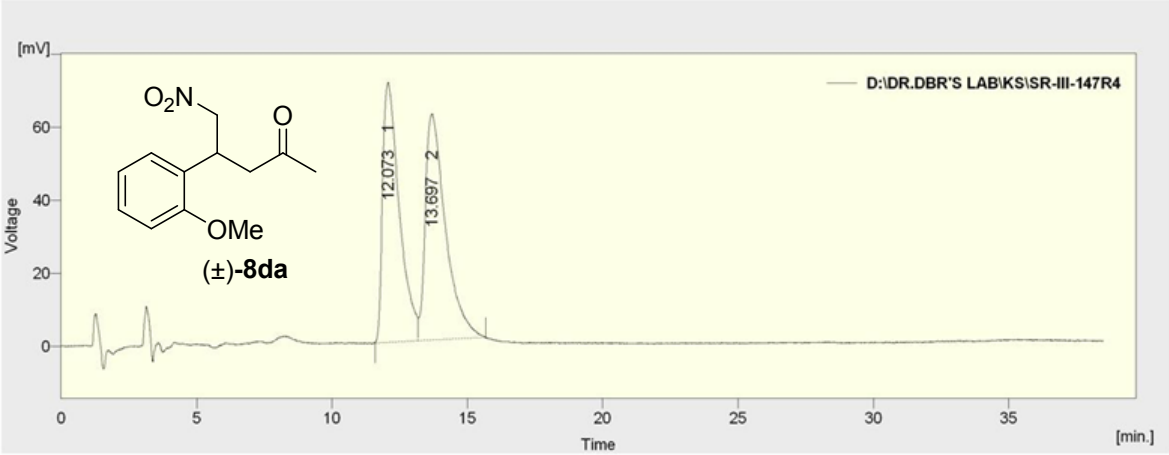
Daicel Chiralpak AD-H, Hexane/ i-PrOH = 90:10, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 220nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT16.444	16.444	428977	14942	4.951	6.286
2	RT17.542	17.542	8235804	222764	95.049	93.714
Total			8664781	237706	100.000	100.000

RACEMIC **8da:**

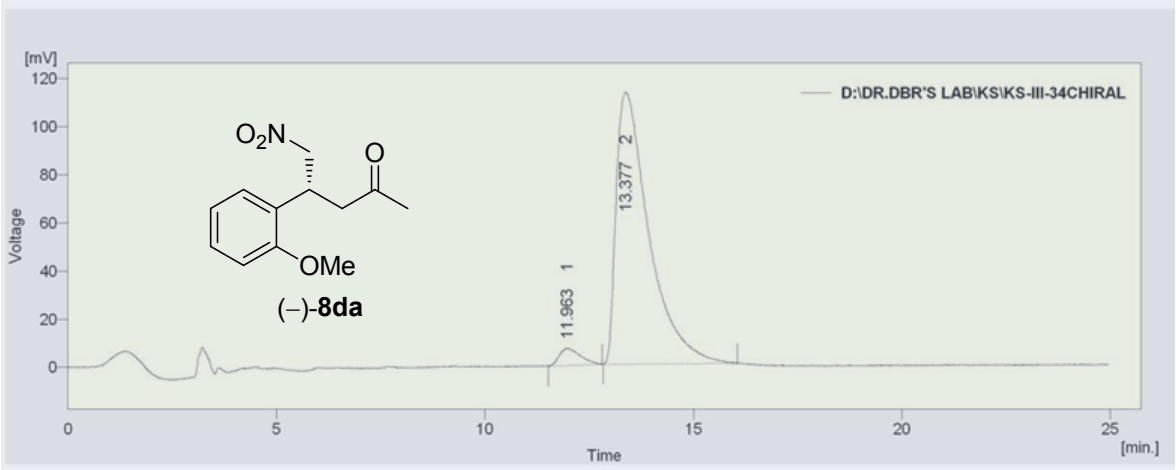


Daicel Chiralpak AS-H, Hexane/ i-PrOH = 85:15, Flow Rate 1.0 mL/Min, 210 nm

Result Table (Uncal - D:\DR.DBR'S LAB\KS\SR-III-147R4)

	Reten. Time [min]	Area [mV.s]	Height [mV]	Area [%]	Height [%]	W05 [min]
1	12.073	3034.404	71.093	48.5	53.5	0.65
2	13.697	3226.514	61.897	51.5	46.5	0.77
	Total	6260.918	132.991	100.0	100.0	

CHIRAL **8da** (92% *ee*):

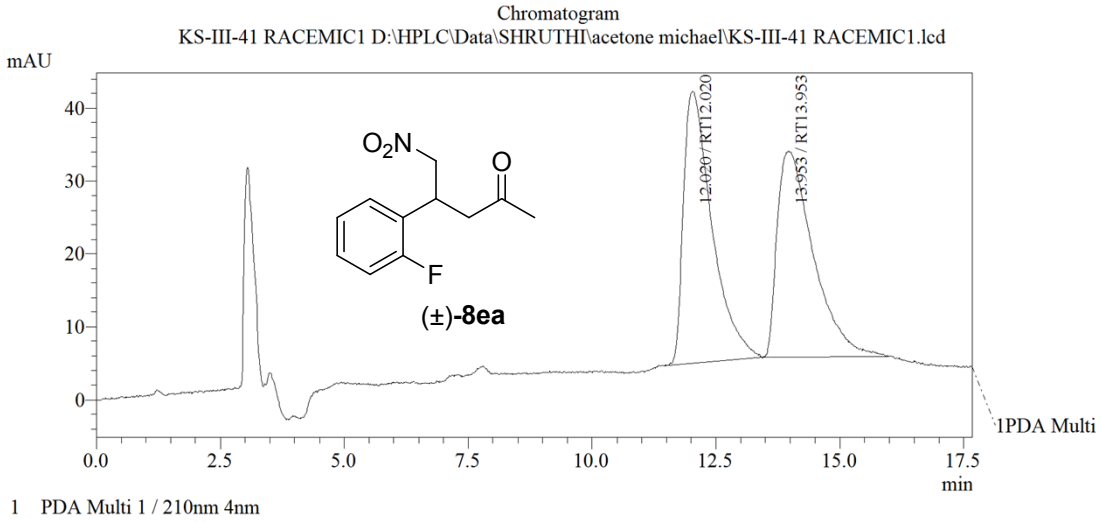


Daicel Chiralpak AS-H, Hexane/ i-PrOH = 85:15, Flow Rate 1.0 mL/Min, 210 nm

Result Table (Uncal - D:\DR.DBR'S LAB\KS\KS-III-34CHIRAL)

	Reten. Time [min]	Area [mV.s]	Height [mV]	Area [%]	Height [%]	W05 [min]
1	11.963	242.367	6.971	3.8	5.8	0.57
2	13.377	6173.698	112.909	96.2	94.2	0.80
	Total	6416.066	119.880	100.0	100.0	

RACEMIC **8ea:**



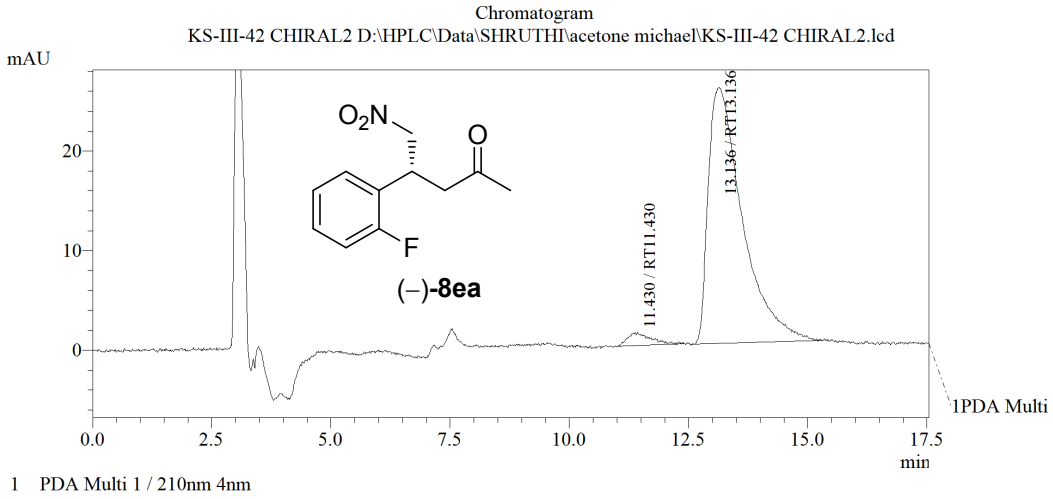
Daicel Chiralpak AS-H, Hexane/i-PrOH = 90:10, Flow Rate 1.0 mL/Min, 210 nm

PeakTable

PDA Ch1 210nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT12.020	12.020	1495941	37330	51.032	56.893
2	RT13.953	13.953	1435424	28284	48.968	43.107
Total			2931365	65614	100.000	100.000

CHIRAL **8ea** (93% *ee*):



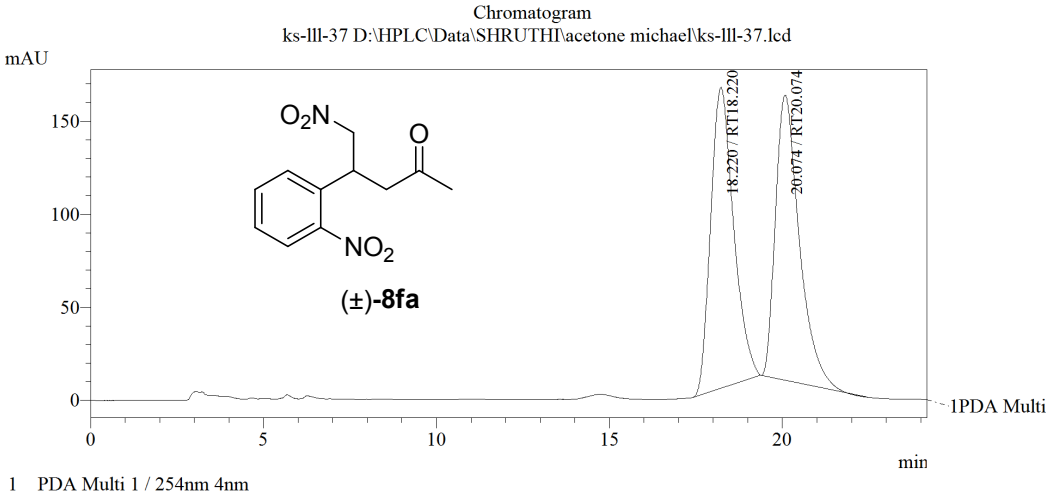
Daicel Chiralpak AS-H, Hexane/i-PrOH = 90:10, Flow Rate 1.0 mL/Min, 210 nm

PeakTable

PDA Ch1 210nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT11.430	11.430	44335	1311	3.349	4.860
2	RT13.136	13.136	1279363	25673	96.651	95.140
Total			1323698	26985	100.000	100.000

RACEMIC **8fa:**



1 PDA Multi 1 / 254nm 4nm

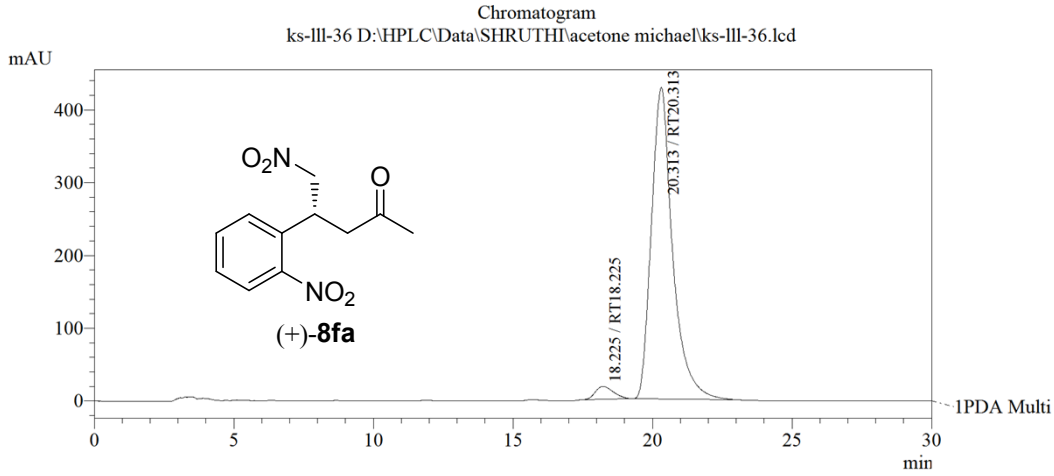
Daicel Chiralpak AD-H, Hexane/ i-PrOH = 90:10, Flow Rate 1.0 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT18.220	18.220	7448150	161633	50.372	51.336
2	RT20.074	20.074	7338088	153222	49.628	48.664
Total			14786238	314855	100.000	100.000

CHIRAL **8fa** (93% *ee*):



1 PDA Multi 1 / 254nm 4nm

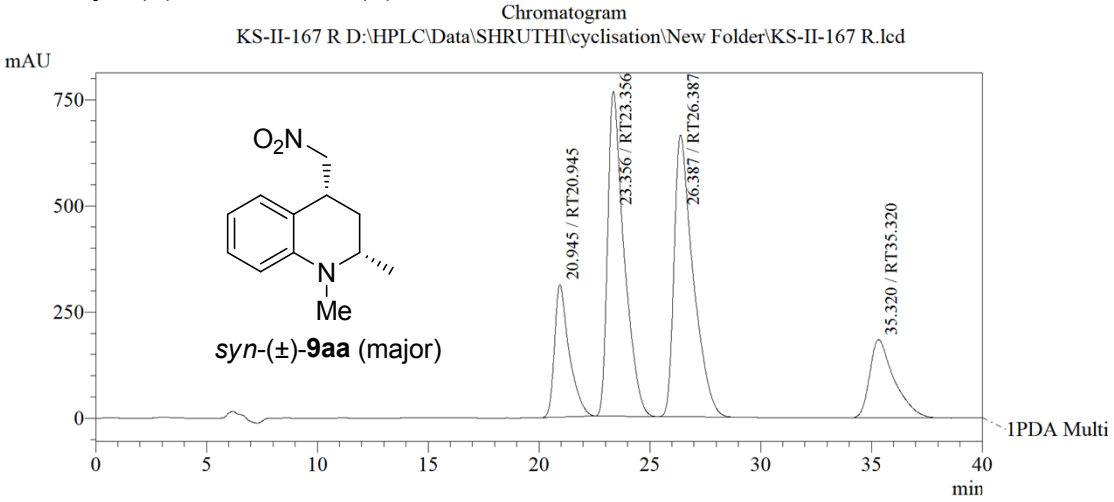
Daicel Chiralpak AD-H, Hexane/i-PrOH = 90:10, Flow Rate 1.0 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT18.225	18.225	774311	17480	3.310	3.924
2	RT20.313	20.313	22617191	427942	96.690	96.076
Total			23391502	445422	100.000	100.000

RACEMIC *syn*-(±)-**9aa** and *anti*-(±)-**9aa:**



1 PDA Multi 1 / 254nm 4nm

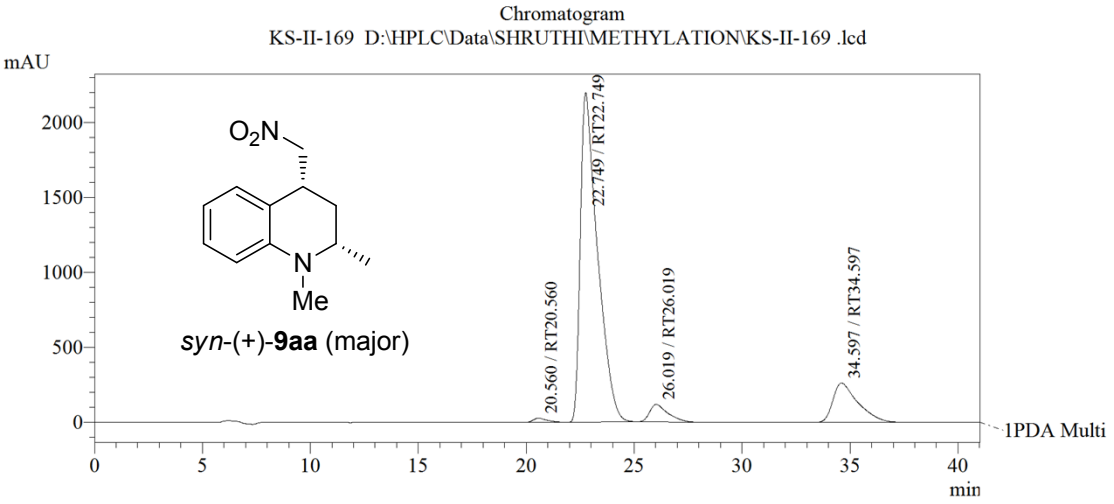
Daicel Chiralcel OD-H, Hexane/ i- PrOH = 95:5, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT20.945	20.945	14339531	312112	13.337	16.217
2	RT23.356	23.356	39402516	764297	36.648	39.711
3	RT26.387	26.387	39603091	663572	36.835	34.478
4	RT35.320	35.320	14169799	184655	13.179	9.594
Total			107514937	1924636	100.000	100.000

CHIRAL *syn*-(+)-**9aa** (**89% *ee***) and *anti*-(+)-**9aa** (**88% *ee***):



1 PDA Multi 1 / 254nm 4nm

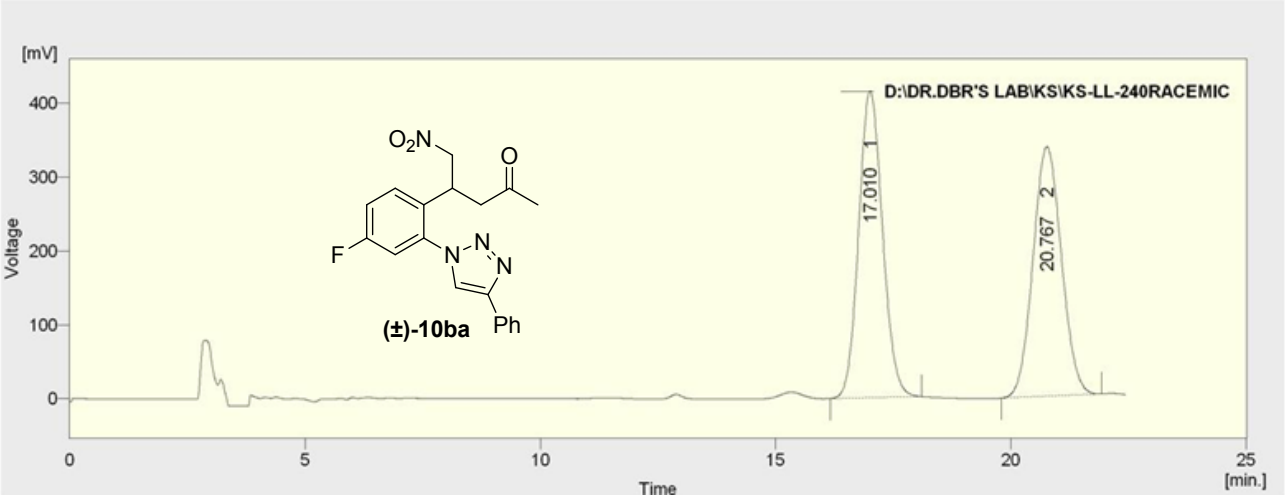
Daicel Chiralcel OD-H, Hexane/ i- PrOH = 95:5, Flow Rate 0.5 mL/Min, 254 nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Name	Ret. Time	Area	Height	Area %	Height %
1	RT20.560	20.560	1287462	28754	0.858	1.106
2	RT22.749	22.749	120918804	2194037	80.611	84.369
3	RT26.019	26.019	6707723	115357	4.472	4.436
4	RT34.597	34.597	21089098	262368	14.059	10.089
Total			150003086	2600516	100.000	100.000

RACEMIC **10ba:**

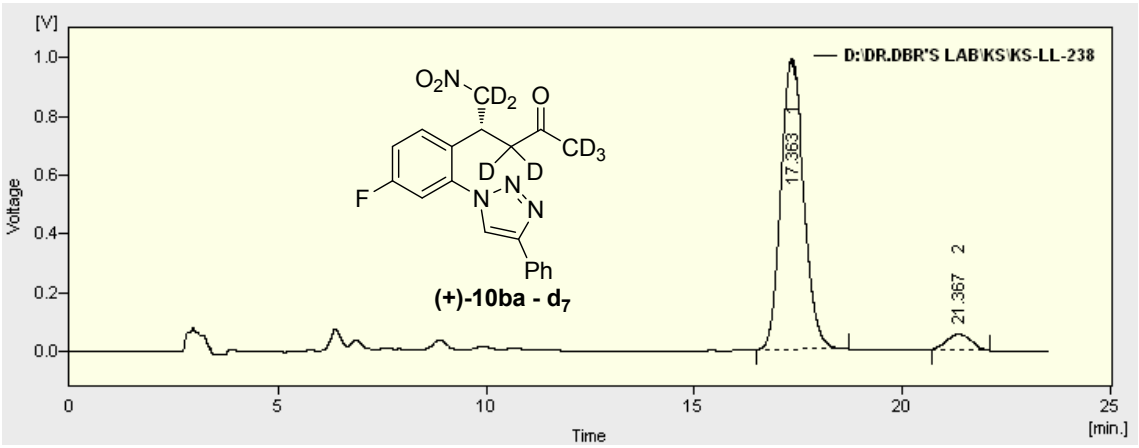


Lux 5u Cellulose-2, Hexane/EtOH = 80:20, Flow Rate 1.0 mL/Min, 254 nm

Result Table (Uncal - D:\DR.DBR'S LAB\KS\KS-LL-240RACEMIC)

	Reten. Time [min]	Area [mV.s]	Height [mV]	Area [%]	Height [%]	W05 [min]
1	17.010	14608.577	415.446	50.7	55.2	0.55
2	20.767	14179.643	337.804	49.3	44.8	0.66
	Total	28788.220	753.250	100.0	100.0	

CHIRAL **10ba-d$_7$** (**89% *ee***):



Lux 5u Cellulose-2, Hexane/EtOH = 80:20, Flow Rate 1.0 mL/Min, 254 nm

Result Table (Uncal - D:\DR.DBR'S LAB\KS\KS-LL-238)

	Reten. Time [min]	Area [mV.s]	Height [mV]	Area [%]	Height [%]	W05 [min]
1	17.363	38448.145	988.673	94.6	94.8	0.61
2	21.367	2190.680	53.838	5.4	5.2	0.66
	Total	40638.825	1042.510	100.0	100.0	