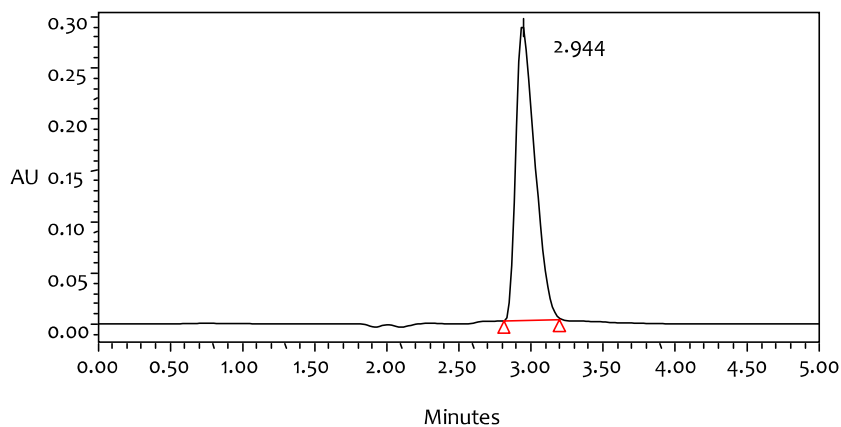


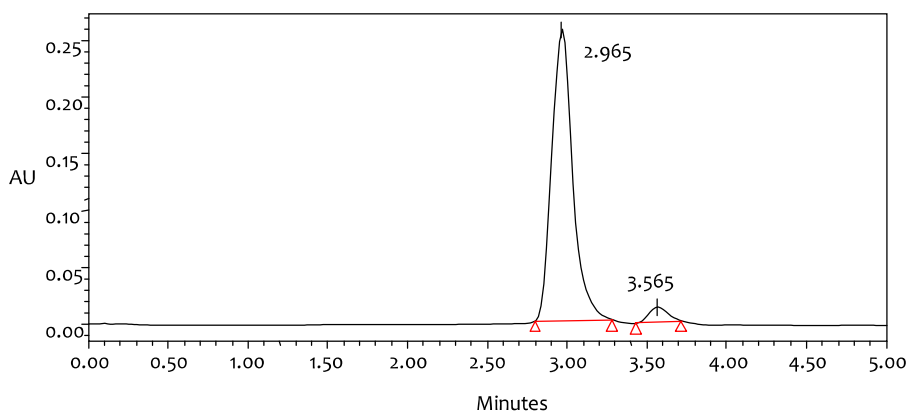
Annexure A

HPLC chromatogram



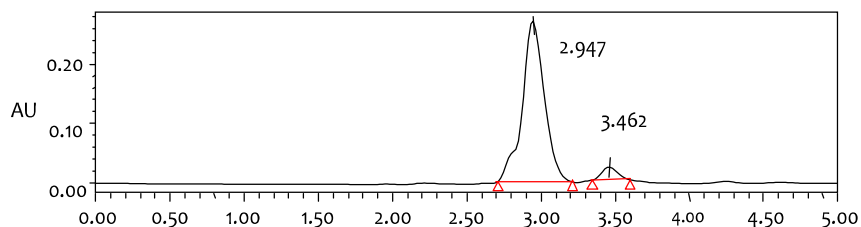
Entry	Name	Retention Time	Area	%Area	Height
1	(R)-(+)-Methyl lactate	2.946	2609171	100.00	284596

A1. HPLC chromatogram of asymmetric heterogeneous hydrogenation of methyl pyruvate on Pt/MWCNT



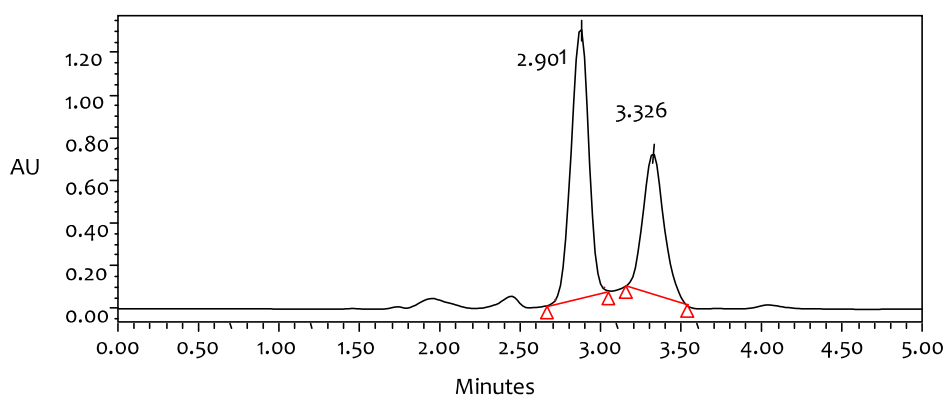
Entry	Name	Retention Time	Area	%Area	Height
1	(R)-(+)-Methyl lactate	2.965	2341750	95.54	256803
2	(S)-(-)-Methyl lactate	3.565	109322	4.46	13403

A2. HPLC chromatogram of asymmetric heterogeneous hydrogenation of methyl pyruvate on Pt/Graphene



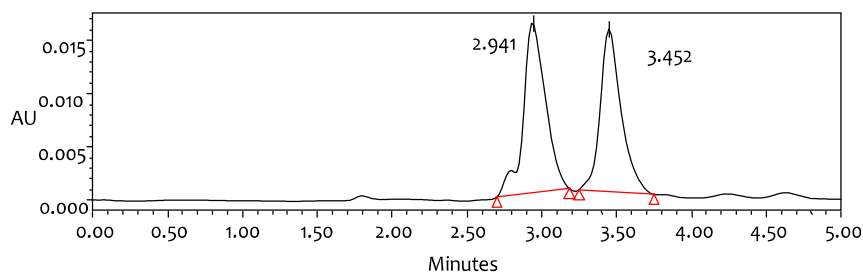
Minutes					
Entry	Name	Retention Time	Area	%Area	Height
1	(R)-(+)-Methyl lactate	2.947	2801796	94.57	269505
2	(S)-(-)-Methyl lactate	3.462	160877	5.43	21586

A3. HPLC chromatogram of asymmetric heterogeneous hydrogenation of methyl pyruvate on Pt/Carbon Fiber



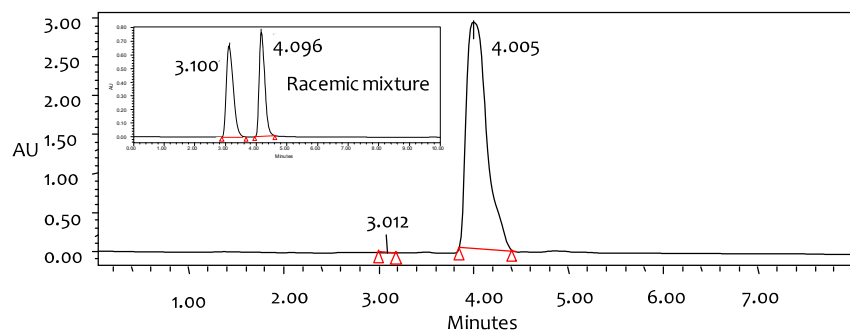
Entry	Name	Retention Time	Area	%Area	Height
1	(R)-(+)-Methyl lactate	2.901	19491979	65.70	2469177
2	(S)-(-)-Methyl lactate	3.326	13712242	34.30	1489737

A4. HPLC chromatogram of asymmetric heterogeneous hydrogenation of methyl pyruvate on commercial Pt/AC



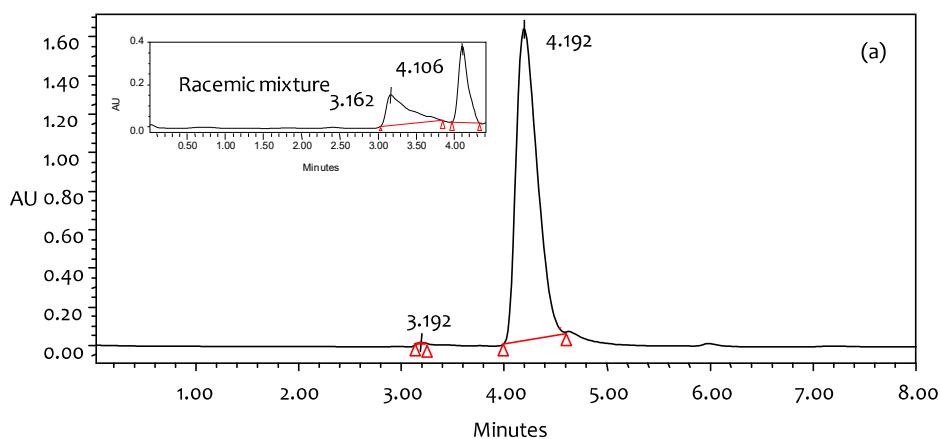
Entry	Name	Retention Time	Area	%Area	Height
1	(R)-(+)-Methyl lactate	2.941	165632	52.57	16084
2	(S)-(-)-Methyl lactate	3.452	149427	47.43	15268

A5. HPLC chromatogram of racemic mixture obtained from hydrogenation reaction without using a chiral modifier

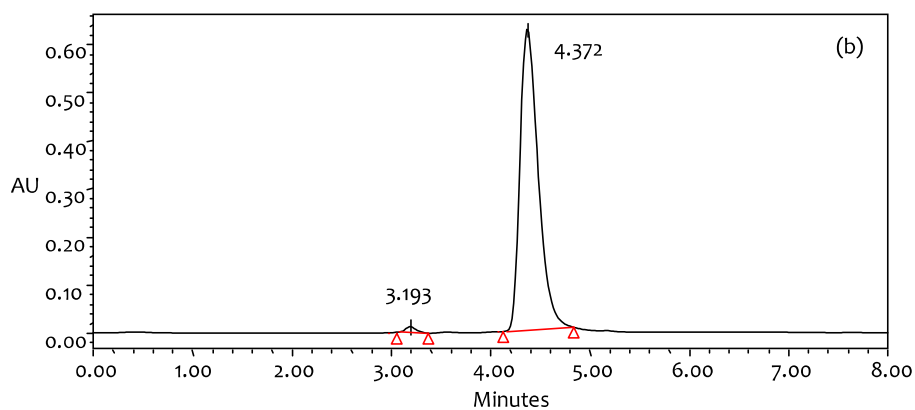


Entry	Name	Retention Time	Area	% Area	Height
1	(R)-(+)-methyl lactate	3.012	5182	< 0.01	816
2	(S)-(-)-methyl lactate	4.005	41985735	> 99.99	2971866

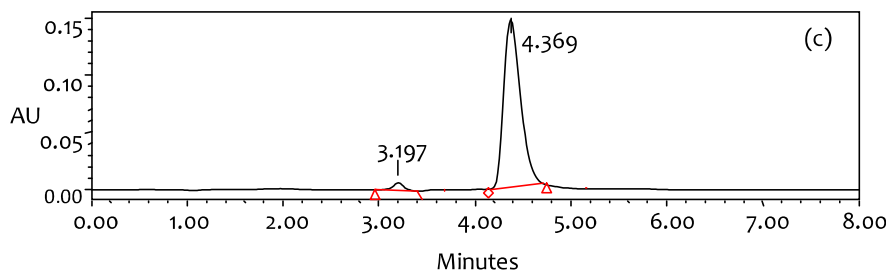
A6. HPLC chromatograms of methyl lactate from Pt HNC/MWCNT



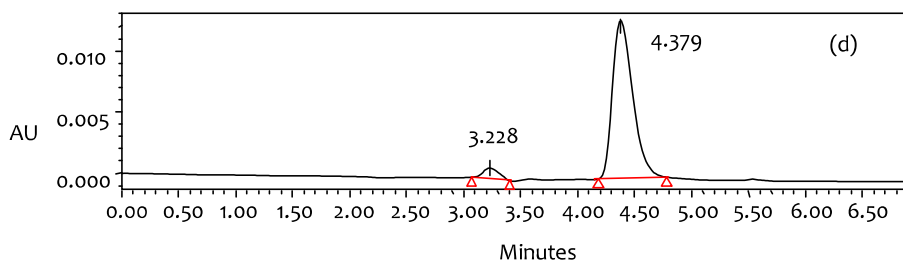
Entry	Name	Retention Time	Area	% Area	Height
1	(R)-(+)-ethyl lactate	3.192	37625	0.17	9388
2	(S)-(-)-ethyl lactate	4.192	21901123	99.83	1581017



Entry	Name	Retention Time	Area	% Area	Height
1	(R)-(+)-ethyl lactate	3.193	74431	1.58	10006
2	(S)-(-)-ethyl lactate	4.372	4634400	98.42	369457

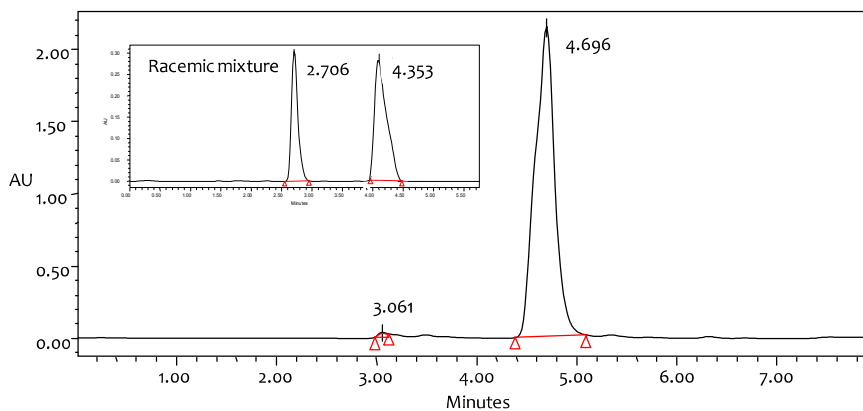


Entry	Name	Retention Time	Area	% Area	Height
1	(R)-(+)-ethyl lactate	3.197	53792	2.70	6708
2	(S)-(-)-ethyl lactate	4.369	1935804	97.30	147873



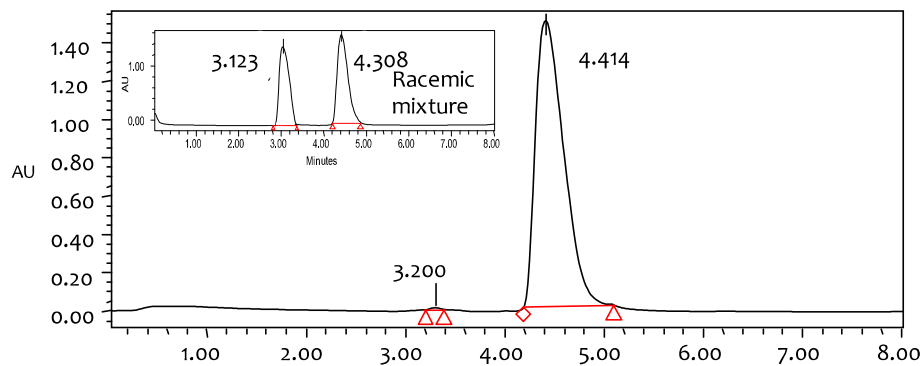
Entry	Name	Retention Time	Area	% Area	Height
1	(R)-(+)-ethyl lactate	3.228	8807	5.26	887
2	(S)-(-)-ethyl lactate	4.379	158705	94.74	12833

A7. HPLC chromatograms of ethyl lactate from (a) Pt HNC/MWNT (b) Pt HNC/ Graphene (c) Pt HNC/AC (d) Pt HNC/CF



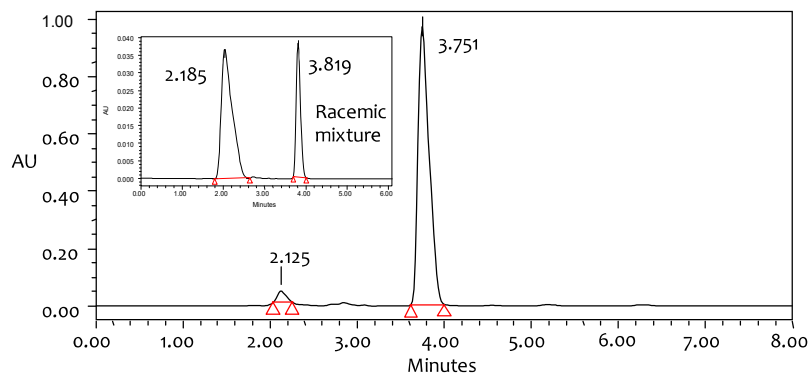
Entry	Name	Retention Time	Area	% Area	Height
1	(R)-(+)-ethyl 2-hydroxy-3-methylbutanoate	3.061	164034	0.62	30236
2	(S)-(-)-ethyl 2-hydroxy-3-methylbutanoate	4.696	26489122	99.38	2062348

A8. HPLC chromatograms of ethyl 2-hydroxy-3-methylbutanoate from Pt HNC/MWCNT



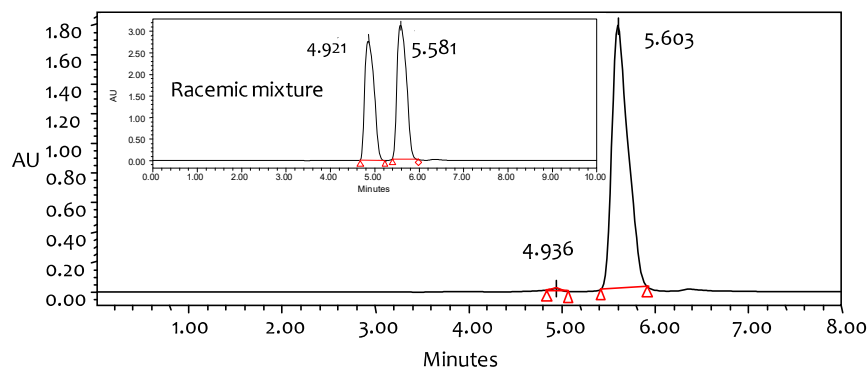
Entry	Name	Retention Time	Area	%Area	Height
1	(R)-(+)-ethyl 2-hydroxy-2-phenylacetate	3.200	52598	0.18	9244
2	(S)-(-)-ethyl 2-hydroxy-2-phenylacetate	4.414	29410633	99.82	1489369

A9. HPLC chromatograms of ethyl 2-hydroxy-2-phenylacetate from Pt HNC/MWCNT



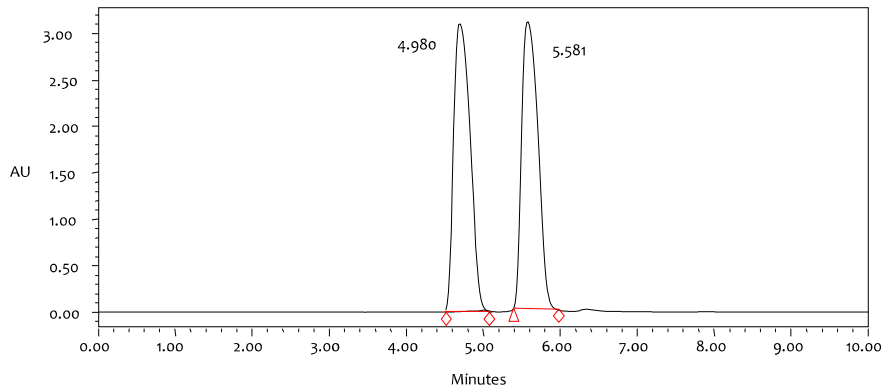
Entry	Name	Retention Time	Area	%Area	Height
1	(R)-(+)-ethyl 3-bromo-2-hydroxypropanoate	2.125	273815	3.06	39553
2	(S)-(-)-ethyl 3-bromo-2-hydroxypropanoate	3.751	8673731	96.94	969987

A10. HPLC chromatograms of ethyl 3-bromo-2-hydroxypropanoate from Pt HNC/MWCNT



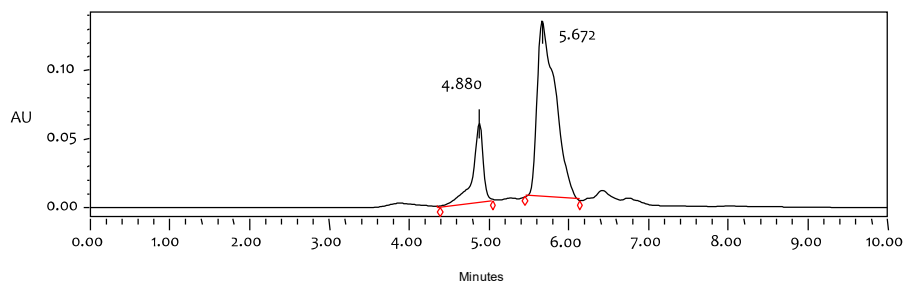
Entry	Name	Retention Time	Area	% Area	Height
1	(R)(+)-ethyl 2-hydroxy-4-phenylbutanoate	4.936	98284	0.46	17036
2	(S)(-)-ethyl 2-hydroxy-4-phenylbutanoate	5.603	21317561	99.54	1775594

A11. HPLC chromatograms of ethyl 2-hydroxy-4-phenylbutanoate from Pt HNC/MWCNT



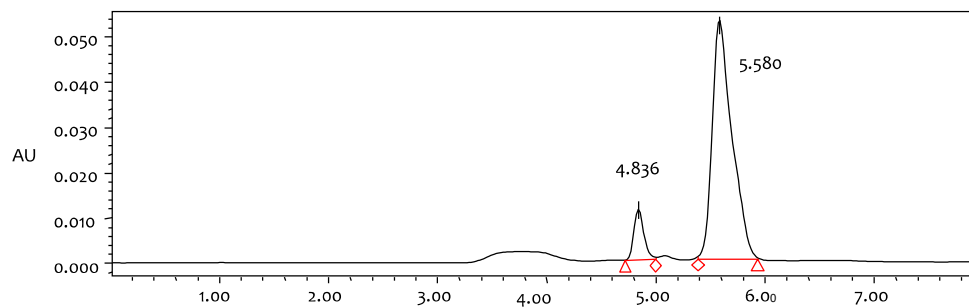
Entry	Name	Retention Time	Area	% Area	Height
1	(R)(+)-ethyl 2-hydroxy-4-phenylbutanoate	4.980	61985935	45.90	2571566
2	(S)(-)-ethyl 2-hydroxy-4-phenylbutanoate	5.581	97985865	55.10	2071587

A12. HPLC chromatogram of racemic ethyl 2-hydroxy-4-phenylbutanoate



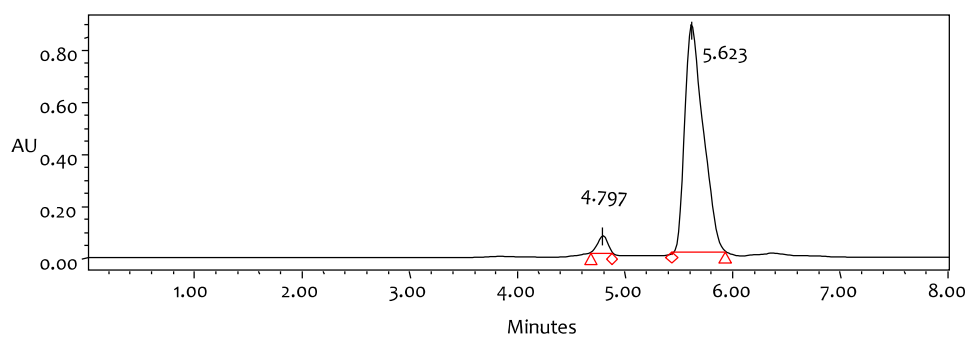
Entry	Name	Retention Time	Area	% Area	Height
1	(R)(+)-ethyl 2-hydroxy-4-phenylbutanoate	4.880	656979	21.90	60731
2	(S)(-)-ethyl 2-hydroxy-4-phenylbutanoate	5.672	2343033	78.10	135038

A13. HPLC chromatogram of ethyl 2-hydroxy-4-phenylbutanoate on catalyst I (15a)



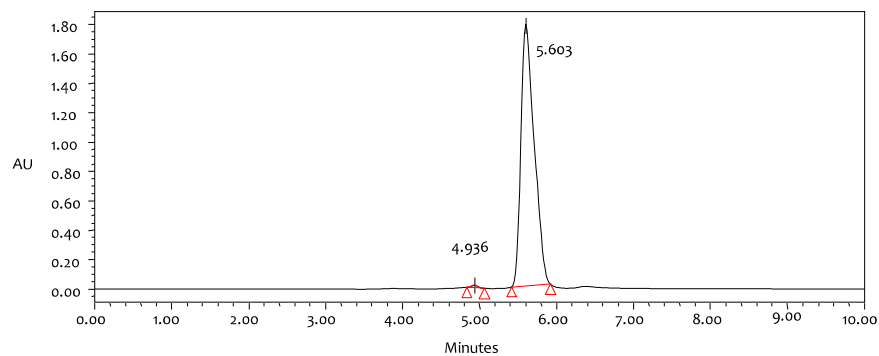
Entry	Name	Retention Time	Area	% Area	Height
1	(R)-(+)-ethyl 2-hydroxy-4-phenylbutanoate	4.836	71296	9.76	11099
2	(S)-(-)-ethyl 2-hydroxy-4-phenylbutanoate	5.580	659227	90.24	52540

A14. HPLC chromatogram of ethyl 2-hydroxy-4-phenylbutanoate on catalyst II (15b)



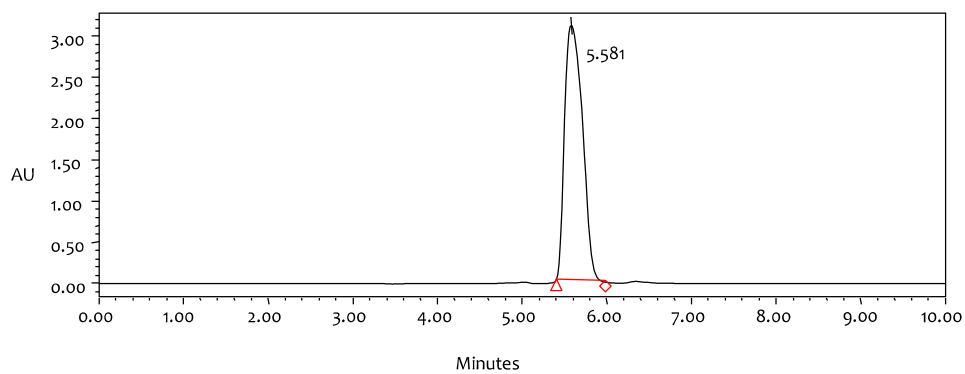
Entry	Name	Retention Time	Area	% Area	Height
1	(R)-(+)-ethyl 2-hydroxy-4-phenylbutanoate	4.797	387672	3.61	63479
2	(S)-(-)-ethyl 2-hydroxy-4-phenylbutanoate	5.623	10365888	96.39	878536

A15. HPLC chromatogram of ethyl 2-hydroxy-4-phenylbutanoate on catalyst III (15c)



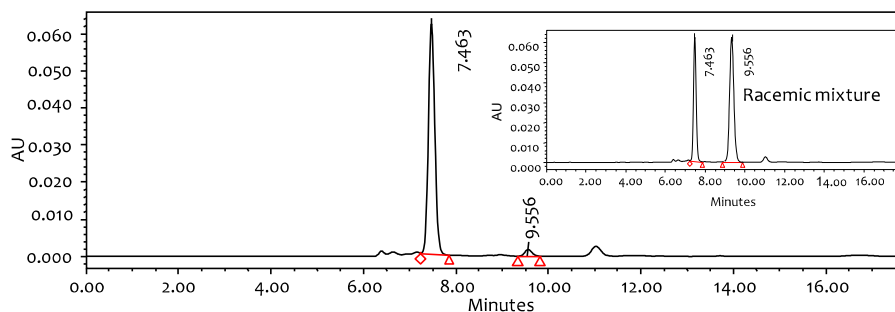
Entry	Name	Retention Time	Area	% Area	Height
1	(R)-(+)-ethyl 2-hydroxy-4-phenylbutanoate	4.936	98284	0.46	17036
2	(S)-(-)-ethyl 2-hydroxy-4-phenylbutanoate	5.603	21317561	99.54	1775594

A16. HPLC chromatogram of ethyl 2-hydroxy-4-phenylbutanoate on catalyst IV (15d)



Entry	Name	Retention Time	Area	% Area	Height
1	(S)-(-)-ethyl 2-hydroxy-4-phenylbutanoate	5.581	41985735	>99.9	2971866

A17. HPLC chromatogram of ethyl 2-hydroxy-4-phenylbutanoate on catalyst V (15e)



Entry	Name	Retention Time	Area	% Area	Height
1	(R)-(+)-N-(1-phenylbut-3-en-1-yl)aniline	7.463	605486	96.98	62173
2	(S)-(-)-N-(1-phenylbut-3-en-1-yl)aniline	9.556	18884	3.02	1749

A18. HPLC chromatograms of a racemic mixture of N-(1-phenylbut-3-en-1-yl) aniline (inset) and (R)-(+)- N-(1-phenylbut-3-en-1-yl) aniline