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APPENDICES

APPENDIX A

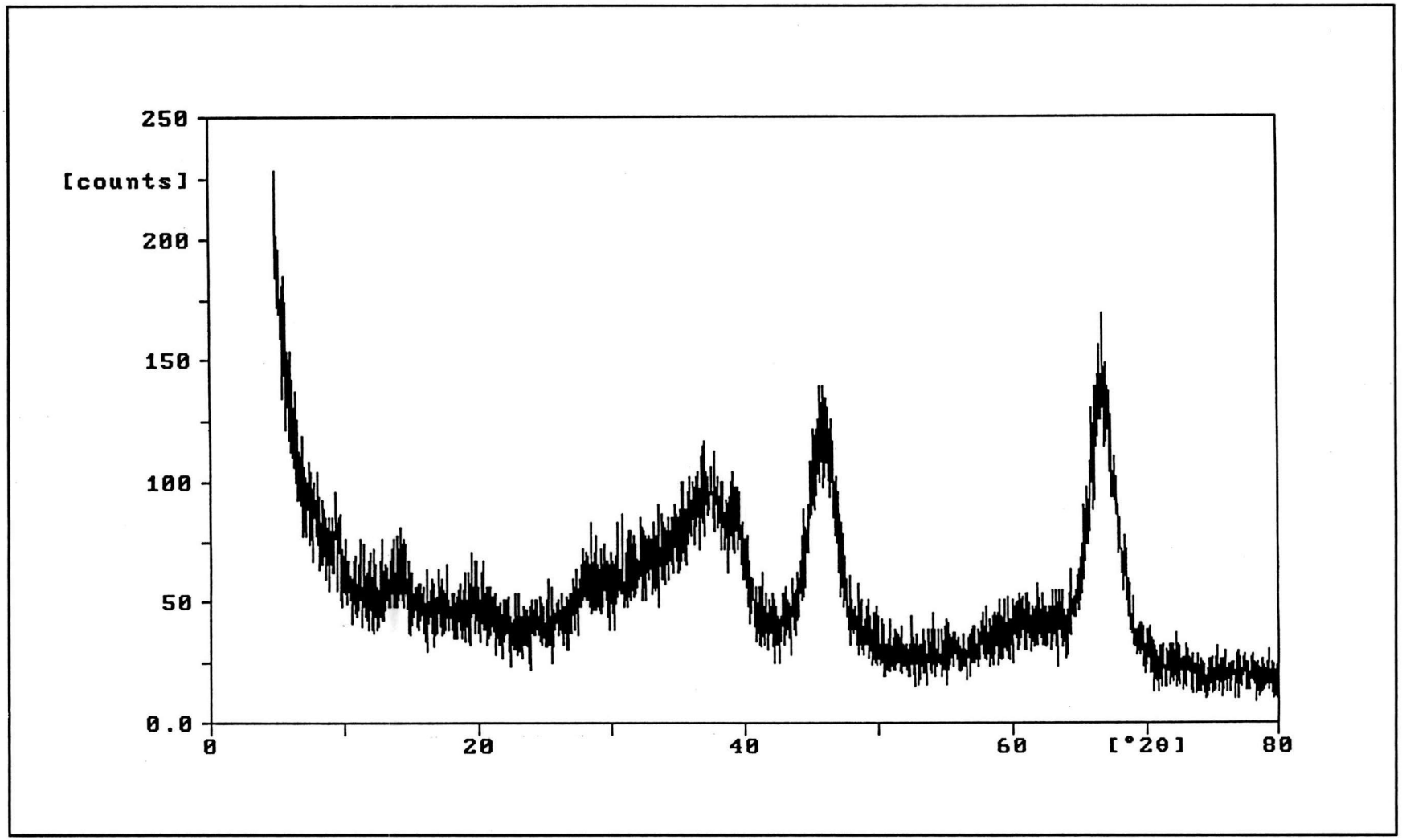

Figure A1 A plot of x-ray diffraction data of alumina

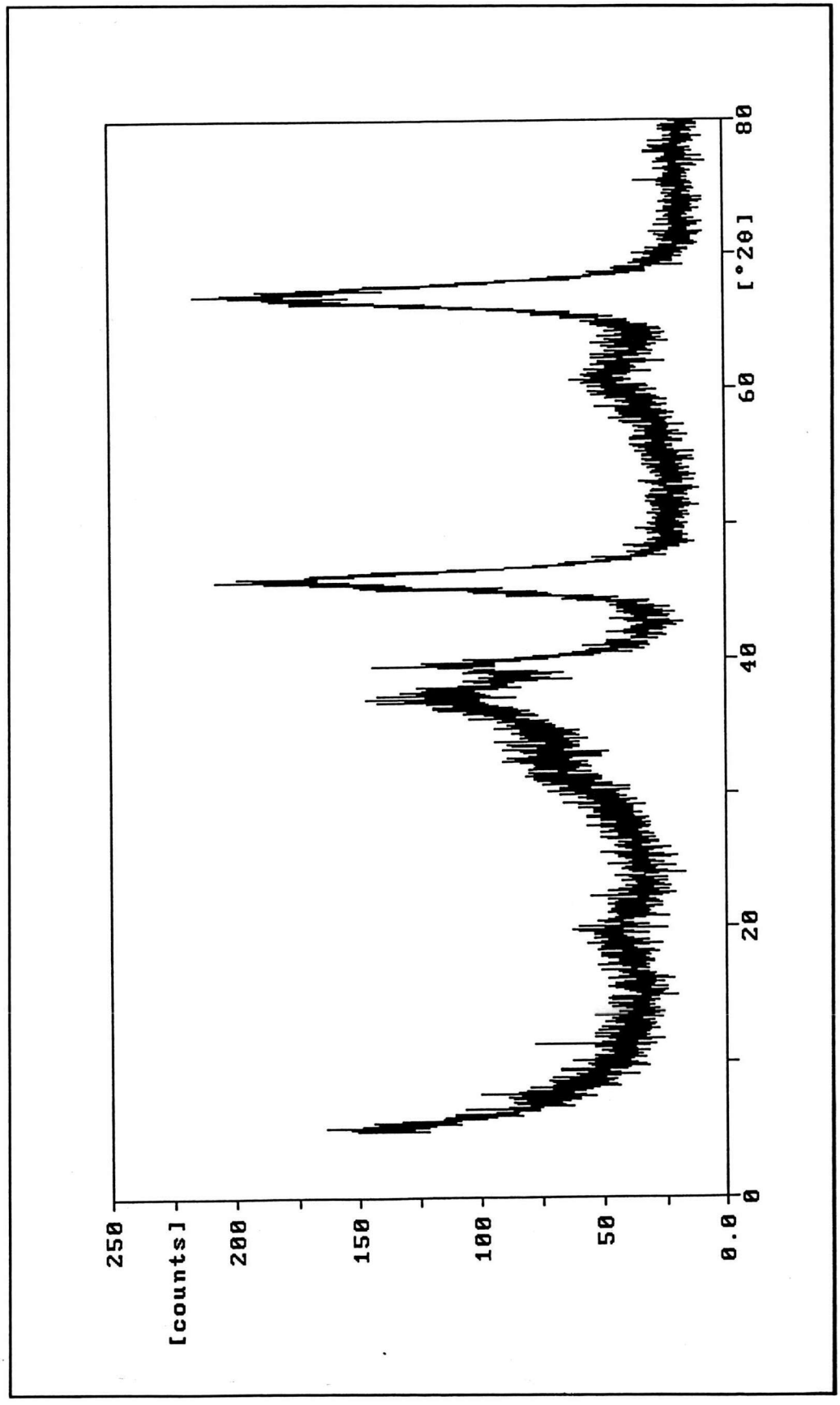

Figure A2 A plot of x-ray diffraction data of platinum fluoride on alumina catalyst

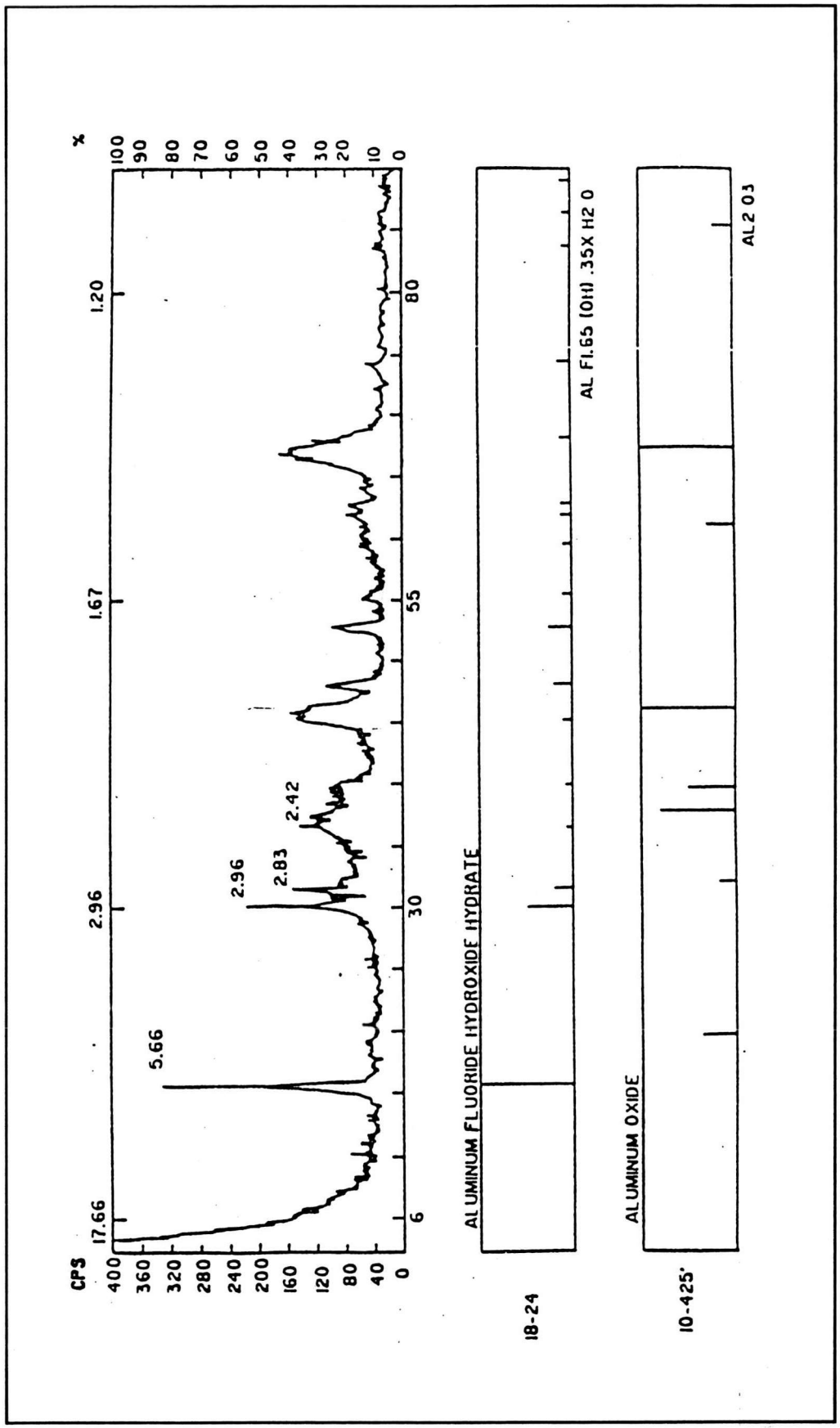

Figure A3 A plot of x-ray diffraction data of catalyst from US. Pat. No. 4,923,841

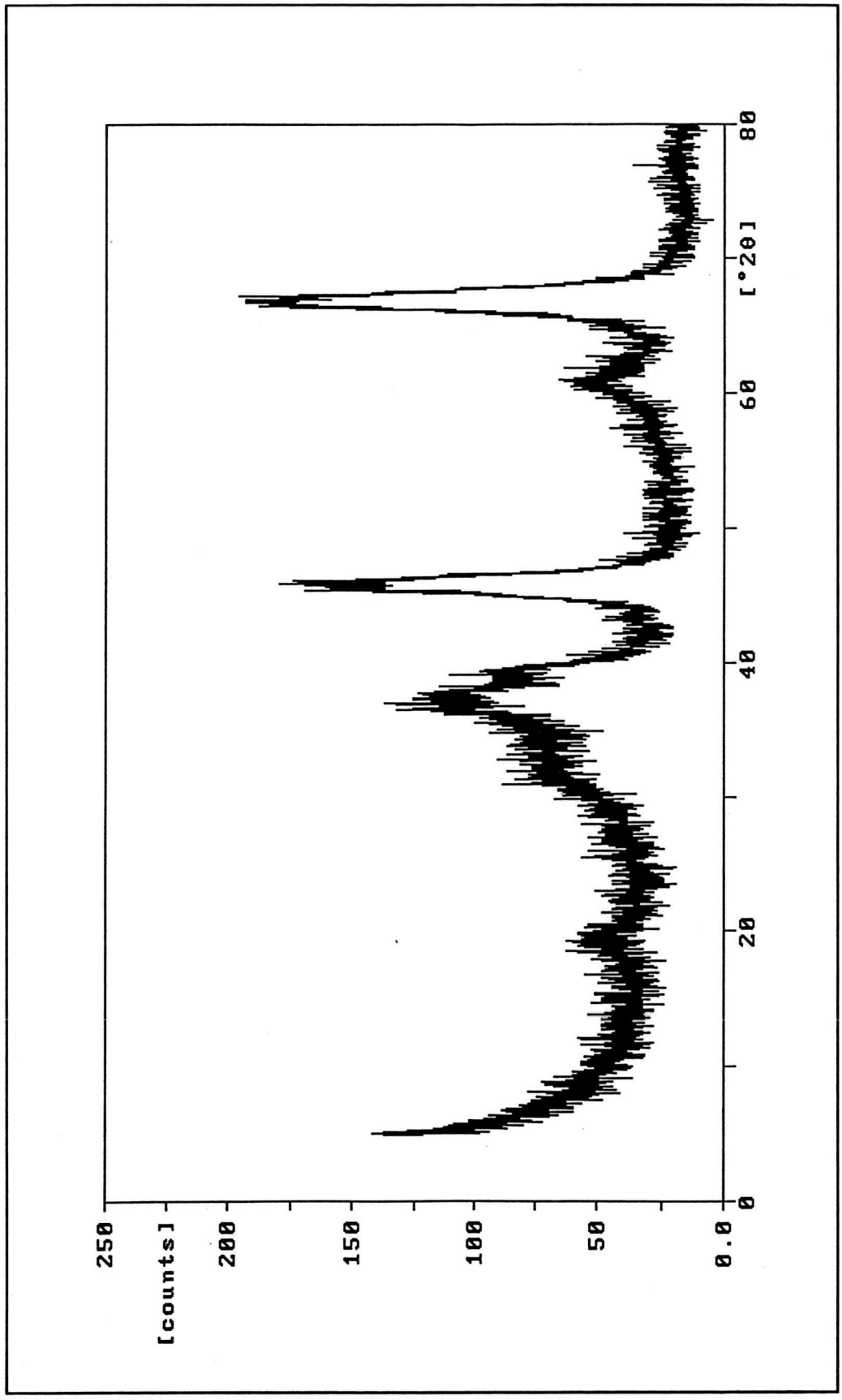

Figure A4 A plot of diffraction data of commercial catalyst

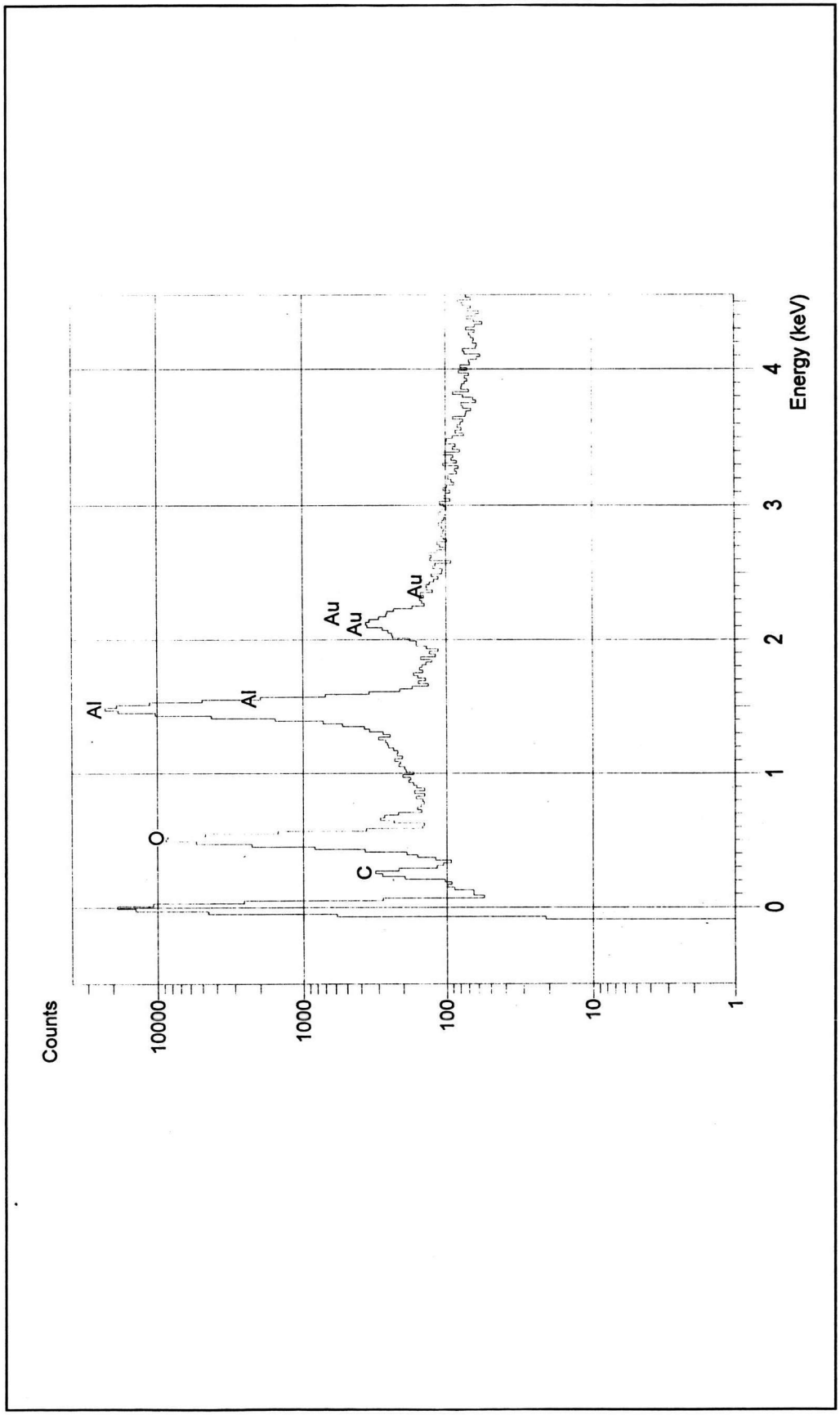

Figure A5 A plot of SEM / EDX data of alumina

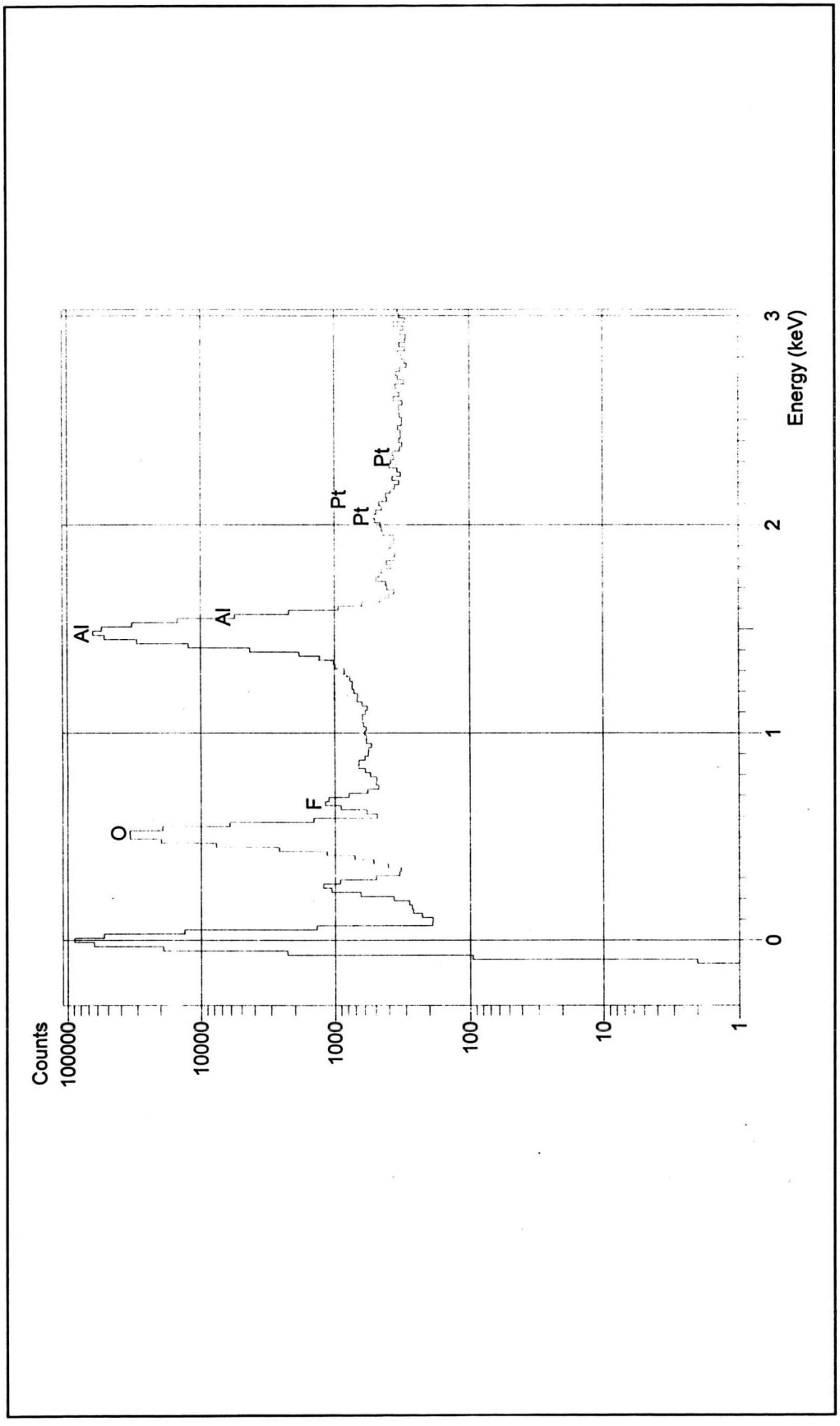

Figure A6 A plot of SEM / EDX data of platinum fluoride on alumina

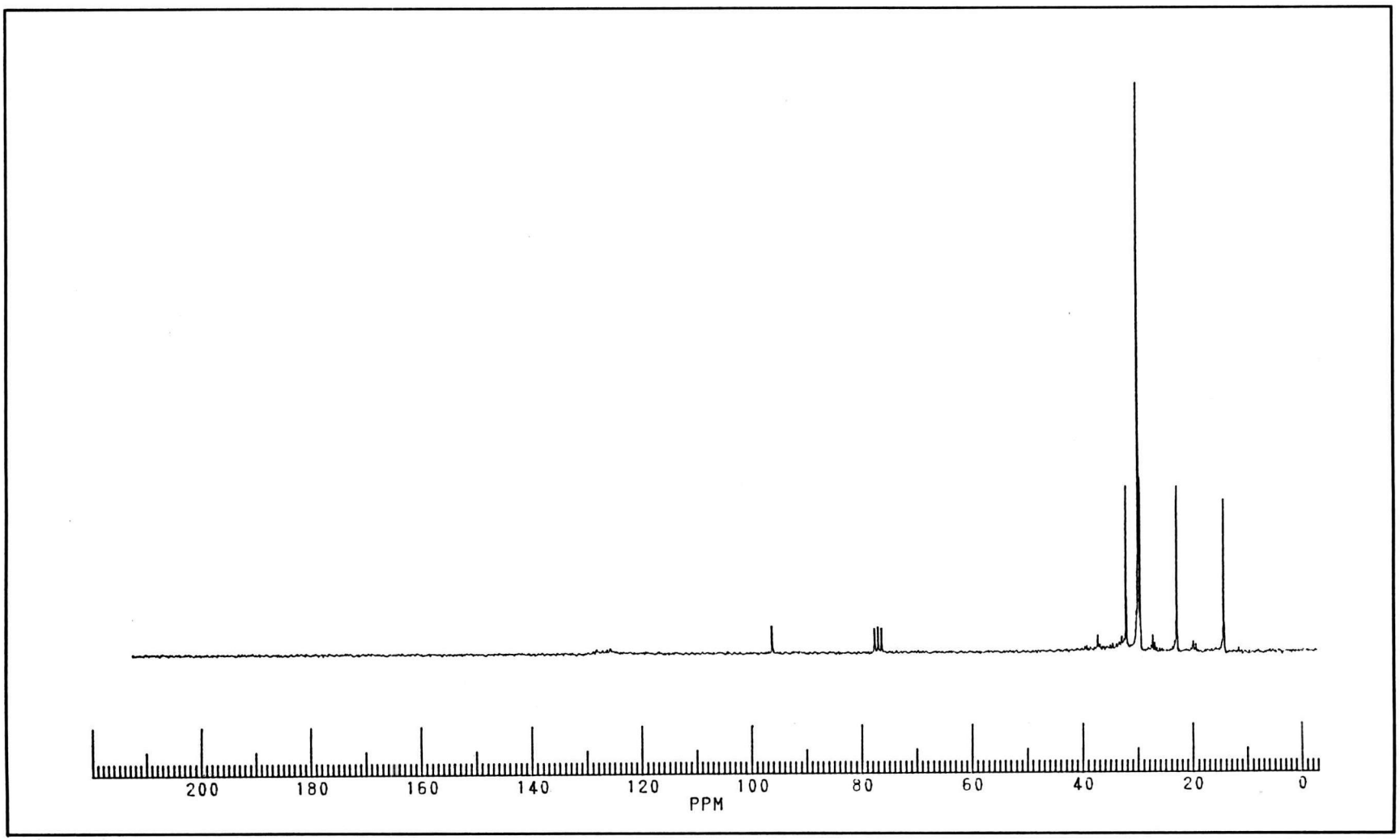

Figure A7 ^{13}C NMR($CDCl_3$) spectrum of product from hydroisomerization at optimum condition

APPENDIX B

Table B1 Composition of products from hydroisomerization as a function of catalyst concentration

Molecular weight	No. of Carbon	Retention time (min)				
		5%	6%	7%	8%	9%
156	C_{11}	4.069	4.113	4.096	4.101	4.094
170	C_{12}	4.860	4.866	4.873	4.856	4.835
184	C_{13}	5.599	5.605	5.612	5.590	5.578
198	C_{14}	6.435	6.427	6.433	6.421	6.391
212	C_{15}	7.464	7.451	7.458	7.431	7.415
226	C_{16}	8.927	8.905	8.915	8.887	8.830
240	C_{17}	10.502	10.491	10.492	10.467	10.437
254	C_{18}	12.094	12.083	12.078	12.065	12.016
268	C_{19}	13.547	13.543	13.543	13.525	13.496
282	C_{20}	14.961	14.953	14.943	14.938	14.883
296	C_{21}	16.447	16.426	16.440	16.419	16.379
310	C_{22}	18.358	18.336	18.339	18.333	18.291
324	C_{23}	20.104	20.080	20.097	20.074	20.061
338	C_{24}	21.634	21.628	21.618	21.625	21.600
352	C_{25}	22.963	22.960	22.968	22.964	22.941

Table B2 The molecular weight distributions of products from hydroisomerization as a function of catalyst concentration

Molecular weight	No. of Carbon	% Peak Area				
		5%	6%	7%	8%	9%
156	C_{11}	7.53	6.71	8.22	5.91	7.21
170	C_{12}	11.92	11.07	11.48	10.82	9.82
184	C_{13}	10.47	10.23	10.95	9.83	10.56
198	C_{14}	15.39	15.54	14.07	15.36	12.45
212	C_{15}	12.84	12.81	12.17	14.56	14.03
226	C_{16}	8.99	9.26	9.84	8.74	8.69
240	C_{17}	7.58	6.59	8.35	5.95	9.65
254	C_{18}	6.94	5.66	7.59	9.72	6.36
268	C_{19}	4.32	4.30	4.16	4.03	3.98
282	C_{20}	4.93	6.06	4.88	5.97	2.55
296	C_{21}	2.73	2.36	2.46	2.37	3.94
310	C_{22}	2.35	2.98	2.64	3.15	1.52
324	C_{23}	1.91	1.14	1.21	1.20	2.09
338	C_{24}	1.37	1.40	1.22	1.52	1.22
352	C_{25}	0.72	0.82	0.78	0.88	0.83

Table B3 Composition of products from hydroisomerization as a function of temperature

Molecular weight	No. of Carbon	Retention time (min)		
		300 °C	350 °C	400 °C
156	C_{11}	4.116	4.149	4.069
170	C_{12}	4.878	4.896	4.860
184	C_{13}	5.618	5.630	5.599
198	C_{14}	6.445	6.456	6.435
212	C_{15}	7.459	7.479	7.464
226	C_{16}	8.925	8.932	8.927
240	C_{17}	10.519	10.517	10.502
254	C_{18}	12.106	12.121	12.094
268	C_{19}	13.564	13.575	13.547
282	C_{20}	14.970	14.979	14.961
296	C_{21}	16.459	16.467	16.447
310	C_{22}	18.370	18.383	18.358
324	C_{23}	20.122	20.134	20.104
338	C_{24}	21.638	21.695	21.634
352	C_{25}	22.979	22.993	22.963

Table B4 The molecular weight distributions of products from hydroisomerization as a function of temperature

Molecular weight	No. of Carbon	% Peak Area		
		300 °C	350 °C	400 °c
156	C_{11}	5.91	9.77	10.53
170	C_{12}	11.04	12.36	13.92
184	C_{13}	10.60	12.02	12.47
198	C_{14}	14.57	14.77	18.39
212	C_{15}	13.39	13.46	9.84
226	C_{16}	8.97	8.52	10.99
240	C_{17}	5.52	7.66	5.58
254	C_{18}	8.70	4.94	4.94
268	C_{19}	3.37	3.54	3.32
282	C_{20}	5.57	4.96	4.93
296	C_{21}	2.08	1.87	1.73
310	C_{22}	2.53	2.26	2.35
324	C_{23}	1.47	1.11	0.91
338	C_{24}	1.59	1.19	1.17
352	C_{25}	0.92	0.68	0.62

Table B5 Composition of products from hydroisomerization as a function of hydrogen pressure

Molecular weight	No. of Carbon	Retention time (min)		
		300 psig	400 psig	500 psig
156	C_{11}	4.118	4.140	3.76
170	C_{12}	4.860	4.899	4.99
184	C_{13}	5.620	5.620	5.98
198	C_{14}	6.447	6.463	6.43
212	C_{15}	7.474	7.490	7.93
226	C_{16}	8.932	8.966	9.39
240	C_{17}	10.519	10.536	10.01
254	C_{18}	12.104	12.121	12.11
268	C_{19}	13.559	13.576	13.39
282	C_{20}	14.966	14.982	14.57
296	C_{21}	16.448	16.465	15.72
310	C_{22}	18.371	18.389	16.78
324	C_{23}	20.107	20.107	17.83
338	C_{24}	21.632	21.648	18.80
352	C_{25}	22.975	22.975	19.75

Table B6 The molecular weight distributions of product from hydroisomerization as a function of hydrogen pressure

Molecular weight	No. of Carbon	% Peak Area		
		300 psig	400 psig	500 psig
156	C_{11}	7.98	8.37	9.86
170	C_{12}	8.88	9.32	12.32
184	C_{13}	8.60	12.87	13.67
198	C_{14}	12.34	12.39	15.06
212	C_{15}	8.74	9.85	10.65
226	C_{16}	11.46	12.27	12.53
240	C_{17}	7.35	8.01	8.34
254	C_{18}	7.58	5.69	5.30
268	C_{19}	5.39	5.01	3.41
282	C_{20}	5.21	4.77	3.05
296	C_{21}	5.18	4.01	1.86
310	C_{22}	4.82	4.71	2.47
324	C_{23}	4.52	4.12	1.02
338	C_{24}	3.78	3.58	1.17
352	C_{25}	5.36	2.97	0.64

Table B7 Composition of products from hydroisomerization as a function of reaction time

Molecular weight	No. of Carbon	Retention time (min)				
		10 min	1 hrs	2 hrs	3 hrs	4 hrs
156	C_{11}	4.97	4.83	5.24	4.98	4.97
170	C_{12}	6.61	6.65	6.24	6.40	6.41
184	C_{13}	7.90	7.98	7.21	7.89	7.14
198	C_{14}	9.36	9.57	8.26	9.35	9.83
212	C_{15}	10.65	10.37	9.36	10.75	10.77
226	C_{16}	12.12	12.15	10.47	12.08	12.94
240	C_{17}	13.36	13.43	11.58	13.34	13.36
254	C_{18}	14.18	14.54	12.66	14.53	14.73
268	C_{19}	15.69	15.68	13.72	15.68	15.70
282	C_{20}	16.24	16.76	14.74	16.75	16.12
296	C_{21}	17.21	17.99	16.66	17.79	18.8
310	C_{22}	18.10	18.78	17.83	18.78	19.76
324	C_{23}	19.20	19.73	18.41	19.93	20.66
338	C_{24}	20.64	20.8	19.93	20.64	21.79
352	C_{25}	21.30	21.52	20.84	21.51	22.38

Table B8 The molecular weight distributions of products from hydroisomerization as a function of reaction time

Molecular weight	No. of Carbon	% Peak Area				
		10 min	1 hrs	2 hrs	3 hrs	4 hrs
156	C_{11}	11.01	11.08	9.97	11.01	9.43
170	C_{12}	9.73	8.08	11.08	8.75	12.34
184	C_{13}	10.15	9.09	10.37	10.11	10.08
198	C_{14}	10.71	12.08	10.72	9.01	9.75
212	C_{15}	11.01	7.39	9.68	10.75	8.06
226	C_{16}	9.72	9.81	10.73	8.04	8.97
240	C_{17}	6.59	7.28	8.01	8.24	7.59
254	C_{18}	5.63	6.68	5.79	6.87	6.08
268	C_{19}	4.71	5.35	6.01	5.46	5.57
282	C_{20}	4.37	4.59	4.07	4.69	4.77
296	C_{21}	4.31	4.74	3.11	4.73	4.10
310	C_{22}	3.08	4.81	3.08	3.99	3.93
324	C_{23}	3.19	3.75	2.55	2.78	3.71
338	C_{24}	3.07	3.08	2.97	3.01	2.70
352	C_{25}	2.72	1.94	2.18	2.56	2.92

Table B9 Composition of products from hydroisomerization as a function of catalyst concentration (second time)

Molecular	No. of	Retention time (min)				
weight	Carbon	5%	6%	7%	8%	9%
156	C_{11}	4.18	4.08	3.76	5.63	4.19
170	C_{12}	4.93	4.98	4.97	6.44	6.14
184	C_{13}	6.36	5.33	6.40	7.89	7.68
198	C_{14}	7.84	6.41	7.90	8.35	9.24
212	C_{15}	8.71	7.89	9.38	9.70	10.53
226	C_{16}	8.97	9.35	10.77	10.74	12.09
240	C_{17}	10.54	10.75	12.09	12.07	13.36
254	C_{18}	12.02	12.08	13.36	13.34	14.18
268	C_{19}	13.28	13.34	14.55	14.53	15.09
282	C_{20}	14.48	14.53	15.69	15.67	16.20
296	C_{21}	15.62	15.67	16.77	16.75	17.54
310	C_{22}	17.74	16.76	17.81	17.79	18.17
324	C_{23}	18.93	17.79	18.80	19.73	19.89
338	C_{24}	20.75	18.93	19.75	20.43	20.96
352	C_{25}	22.48	20.75	21.54	22.08	21.54

Table B10 The molecular weight distributions of products from hydroisomerization as a function of catalyst concentration (second time)

Molecular weight	No. of Carbon	% Peak Area				
		5%	6%	7%	8%	9%
156	C_{11}	9.41	10.08	8.29	8.31	7.88
170	C_{12}	9.17	12.57	10.11	10.80	9.39
184	C_{13}	9.03	9.01	12.37	9.18	10.80
198	C_{14}	10.39	10.12	13.12	14.44	12.74
212	C_{15}	10.23	12.17	10.77	11.89	11.58
226	C_{16}	9.82	9.02	11.38	10.01	10.92
240	C_{17}	7.74	8.10	9.42	8.72	7.08
254	C_{18}	6.08	7.23	5.72	7.01	6.18
268	C_{19}	5.12	4.19	4.88	5.72	5.32
282	C_{20}	4.13	3.21	4.21	4.01	4.71
296	C_{21}	4.18	3.70	3.72	3.72	3.02
310	C_{22}	3.95	3.51	3.17	3.26	2.18
324	C_{23}	3.71	2.83	1.32	2.11	3.01
338	C_{24}	2.88	1.23	0.71	1.85	3.27
352	C_{25}	1.56	1.77	0.81	0.97	1.92

Table B11 Composition of products from hydroisomerization as a function of temperature (second time)

Molecular weight	No. of Carbon	Retention time (min)		
		300 °C	350 °C	400 °C
156	C_{11}	4.83	4.88	4.18
170	C_{12}	6.65	5.97	4.93
184	C_{13}	7.98	6.35	6.36
198	C_{14}	9.57	7.91	7.84
212	C_{15}	10.13	9.36	8.17
226	C_{16}	12.15	10.74	8.97
240	C_{17}	13.43	12.09	10.54
254	C_{18}	14.54	13.34	12.02
268	C_{19}	15.68	14.54	13.28
282	C_{20}	16.76	15.68	14.48
296	C_{21}	17.43	16.71	15.62
310	C_{22}	18.78	18.79	17.14
324	C_{23}	19.73	19.74	18.93
338	C_{24}	20.64	20.65	20.75
352	C_{25}	21.52	21.53	22.48

Table B12 The molecular weight distributions of products from hydroisomerization as a function of temperature (second time)

Molecular weight	No. of Carbon	% Peak Area		
		300 °C	350 °C	400 °c
156	C_{11}	5.74	6.49	9.41
170	C_{12}	11.98	12.23	13.17
184	C_{13}	11.83	11.91	12.03
198	C_{14}	13.57	13.36	15.39
212	C_{15}	13.40	13.70	14.23
226	C_{16}	10.28	11.20	9.82
240	C_{17}	8.77	8.25	5.74
254	C_{18}	7.32	4.19	4.08
268	C_{19}	4.01	4.21	4.12
282	C_{20}	4.46	3.40	2.73
296	C_{21}	5.92	4.25	3.18
310	C_{22}	3.17	3.13	2.95
324	C_{23}	3.31	2.07	1.75
338	C_{24}	2.94	1.23	0.88
352	C_{25}	2.70	0.78	0.56

Table B13 Composition of products from hydroisomerization as a function of hydrogen pressure (second time)

Molecular weight	No. of Carbon	Retention time (min)		
		300 psi	400 psi	500 psi
156	C_{11}	4.29	4.25	4.08
170	C_{12}	4.78	4.83	4.76
184	C_{13}	5.75	5.59	5.73
198	C_{14}	6.65	6.58	6.35
212	C_{15}	7.38	7.53	7.84
226	C_{16}	8.94	8.99	9.25
240	C_{17}	10.73	10.61	10.02
254	C_{18}	12.07	12.38	12.06
268	C_{19}	13.60	13.67	13.25
282	C_{20}	14.85	15.35	14.39
296	C_{21}	16.73	16.73	15.46
310	C_{22}	18.35	18.46	16.67
324	C_{23}	20.14	20.28	17.88
338	C_{24}	21.74	21.69	18.74
352	C_{25}	22.86	22.99	19.66

Table B14 The molecular weight distributions of product from hydroisomerization as a function of hydrogen pressure (second time)

Molecular weight	No. of Carbon	% Peak Area		
		300 psi	400 psi	500 psi
156	C_{11}	10.12	10.72	11.24
170	C_{12}	10.72	11.66	12.25
184	C_{13}	11.38	12.08	12.10
198	C_{14}	13.27	13.71	13.73
212	C_{15}	10.39	10.32	10.12
226	C_{16}	10.01	10.01	9.38
240	C_{17}	7.61	10.78	8.32
254	C_{18}	5.22	4.69	4.44
268	C_{19}	5.70	4.36	4.31
282	C_{20}	4.81	2.31	3.08
296	C_{21}	3.74	2.79	4.72
310	C_{22}	4.01	3.26	1.95
324	C_{23}	3.79	2.79	2.79
338	C_{24}	3.83	2.63	1.93
352	C_{25}	2.30	1.89	1.64

Table B15 Composition of products from hydroisomerization as a function of reaction time (second time)

Molecular weight	No. of Carbon	Retention time (min)				
		10 min	1 hrs	2 hrs	3 hrs	4 hrs
156	C_{11}	4.82	4.71	4.93	4.74	4.81
170	C_{12}	6.01	6.58	6.29	6.35	6.72
184	C_{13}	7.20	7.40	7.32	7.73	7.13
198	C_{14}	9.20	9.35	8.05	9.48	9.35
212	C_{15}	10.72	10.01	9.21	10.57	10.87
226	C_{16}	12.55	12.79	10.33	12.34	12.60
240	C_{17}	13.71	13.86	11.72	13.58	13.18
254	C_{18}	14.39	14.71	12.56	14.30	14.68
268	C_{19}	15.01	15.97	13.63	15.71	15.43
282	C_{20}	16.58	16.49	14.84	16.59	16.03
296	C_{21}	17.01	17.80	16.53	17.68	18.71
310	C_{22}	18.50	18.59	17.83	18.39	19.35
324	C_{23}	19.08	19.70	18.41	19.17	20.72
338	C_{24}	20.32	20.67	19.93	20.37	21.83
352	C_{25}	21.77	21.41	20.84	21.46	22.18

Table B16 The molecular weight distributions of products from hydroisomerization as a function of reaction time (second time)

Molecular weight	No. of Carbon	% Peak Area				
		10 min	1 hrs	2 hrs	3 hrs	4 hrs
156	C_{11}	10.82	10.01	12.01	10.18	12.26
170	C_{12}	10.76	9.08	10.51	11.91	9.09
184	C_{13}	13.01	11.81	11.07	9.97	10.27
198	C_{14}	12.79	12.65	9.03	13.06	10.08
212	C_{15}	9.53	9.08	8.44	9.08	8.76
226	C_{16}	8.77	8.75	9.56	7.67	9.35
240	C_{17}	7.22	7.29	7.44	8.01	7.74
254	C_{18}	6.43	6.08	6.40	5.79	6.18
268	C_{19}	4.93	5.11	5.77	5.88	5.84
282	C_{20}	4.55	4.83	4.22	4.75	4.95
296	C_{21}	3.76	5.09	3.74	4.91	4.83
310	C_{22}	4.18	3.74	4.31	3.73	3.73
324	C_{23}	2.26	2.99	3.70	3.71	2.90
338	C_{24}	4.01	1.60	2.17	2.73	1.85
352	C_{25}	2.98	2.83	1.83	2.22	2.77

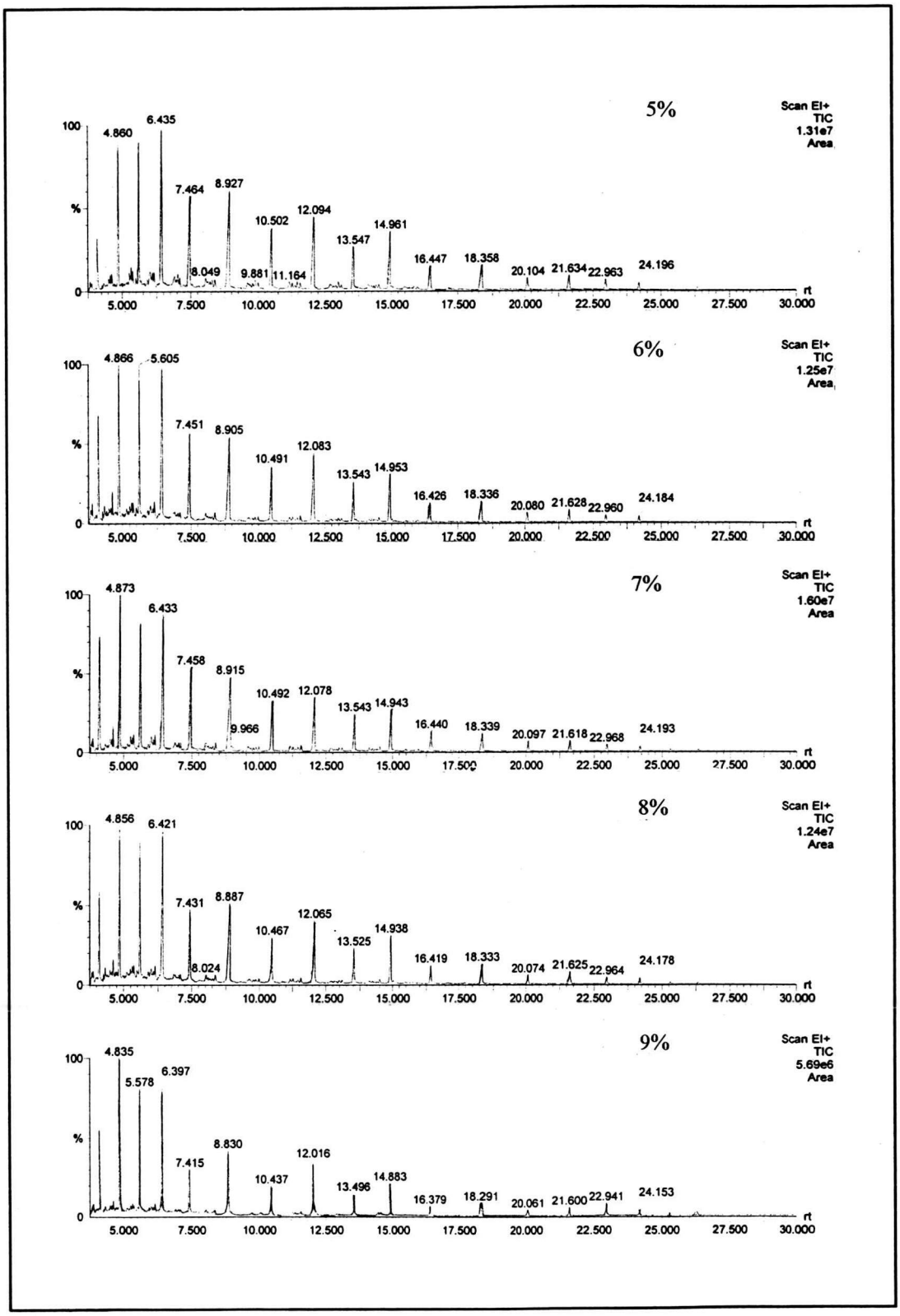

Figure B1 GC/MS chromatogram of products from hydroisomerization as a function of catalyst concentration

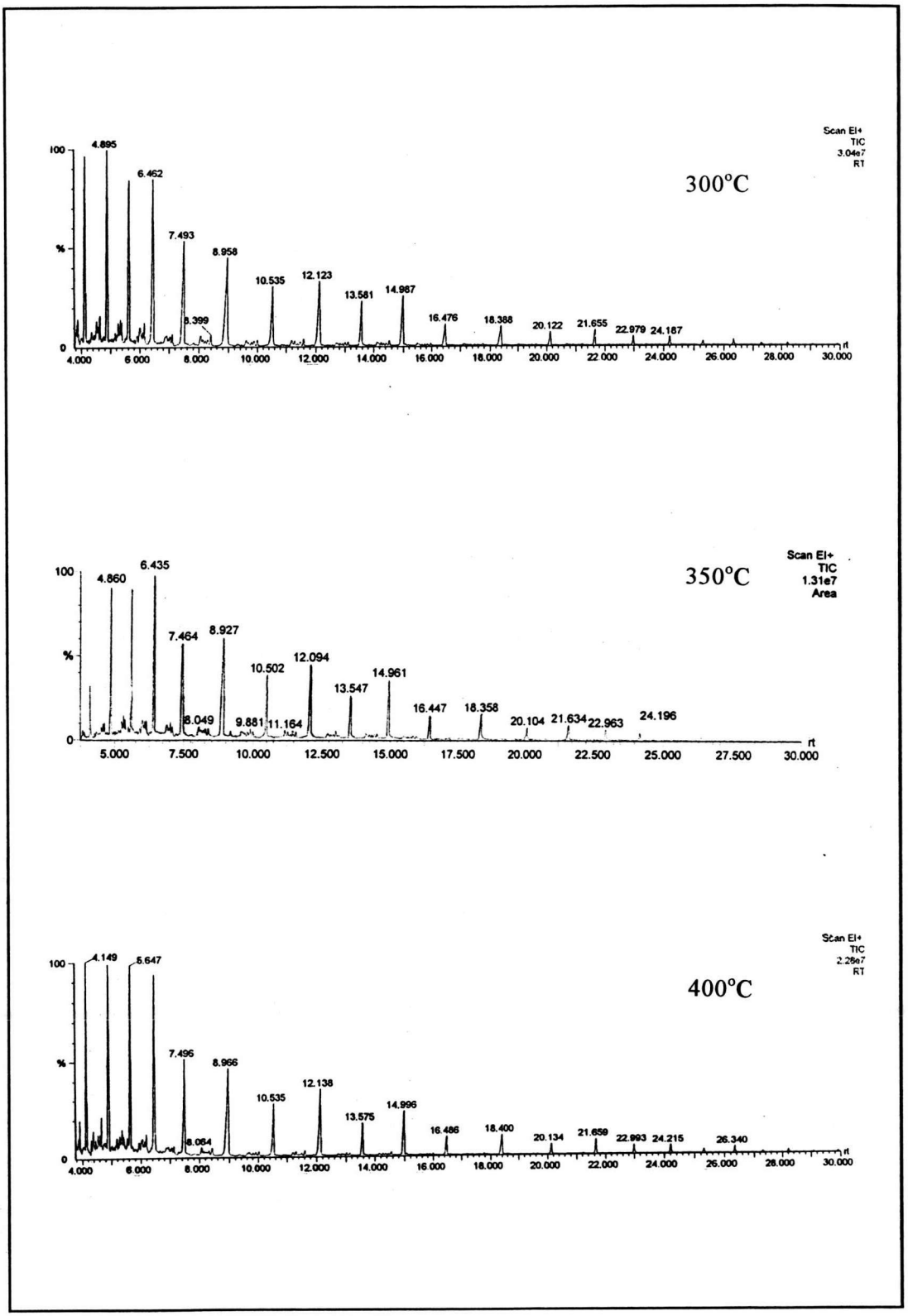

Figure B2 GC/MS chromatogram of products from hydroisomerization as a function of temperature

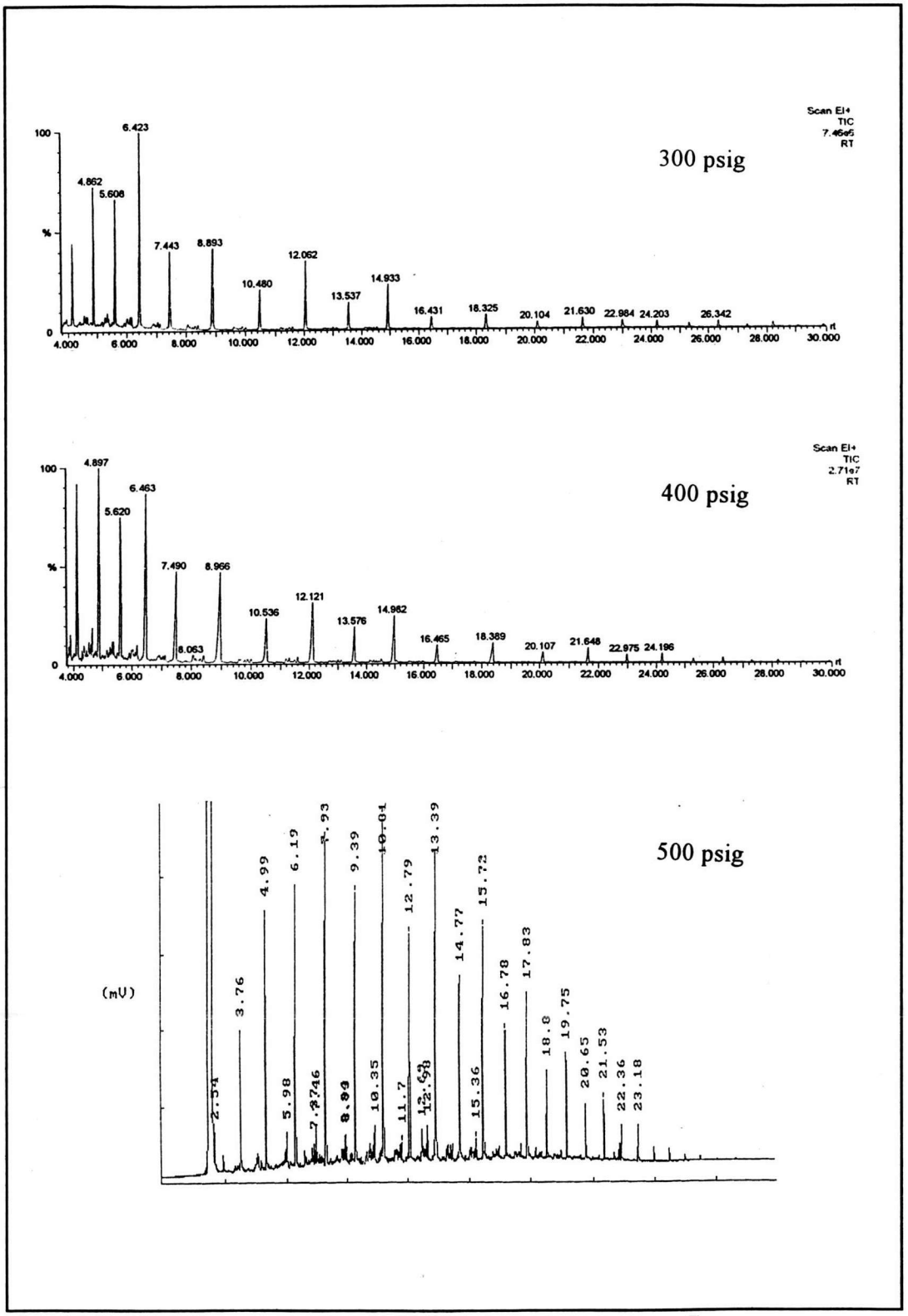

Figure B3 GC/MS and GC chromatogram of products from hydroisomerization as a function of hydrogen pressure

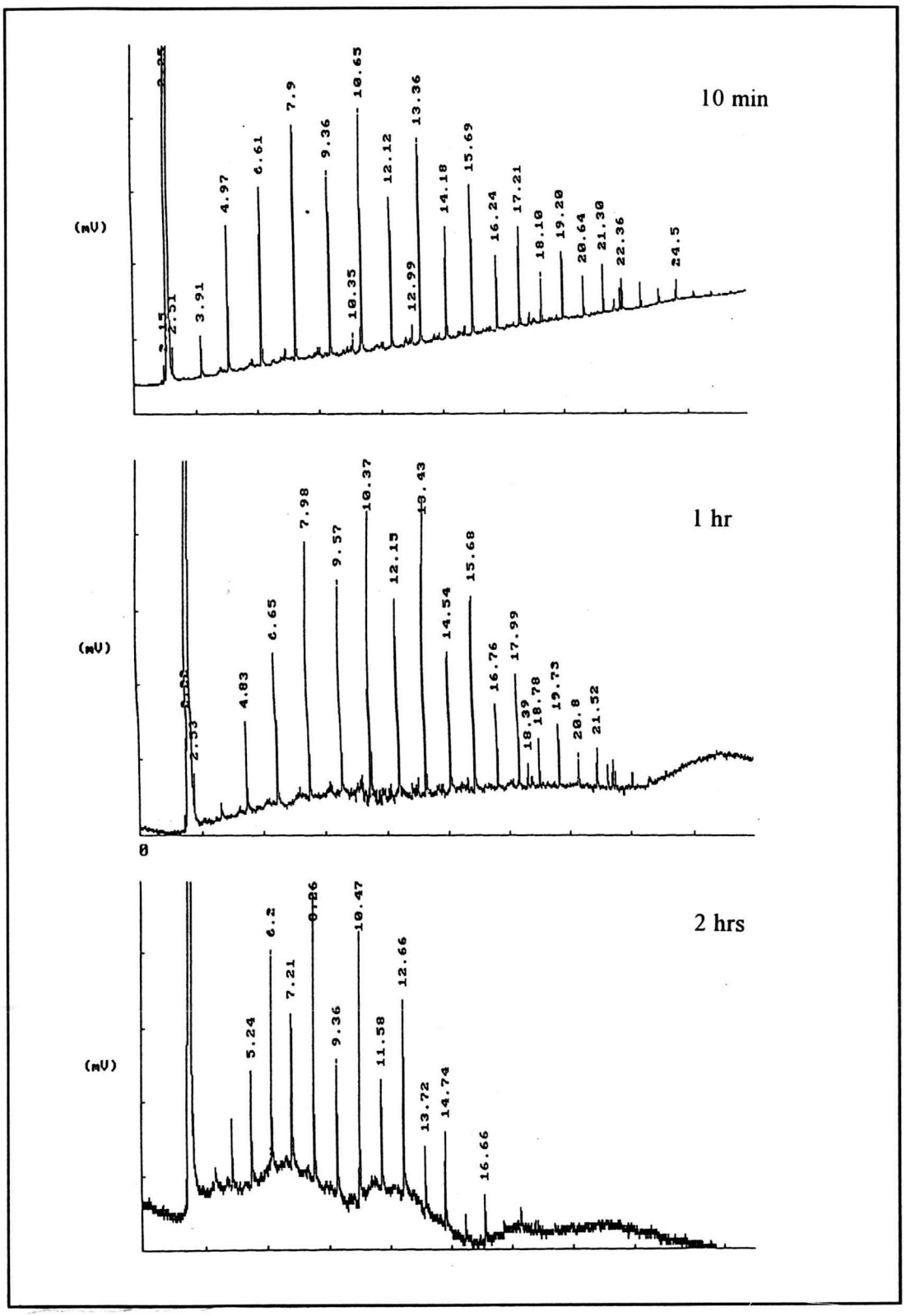

Figure B4 GC chromatogram of products from hydroisomerization as a function of reaction time

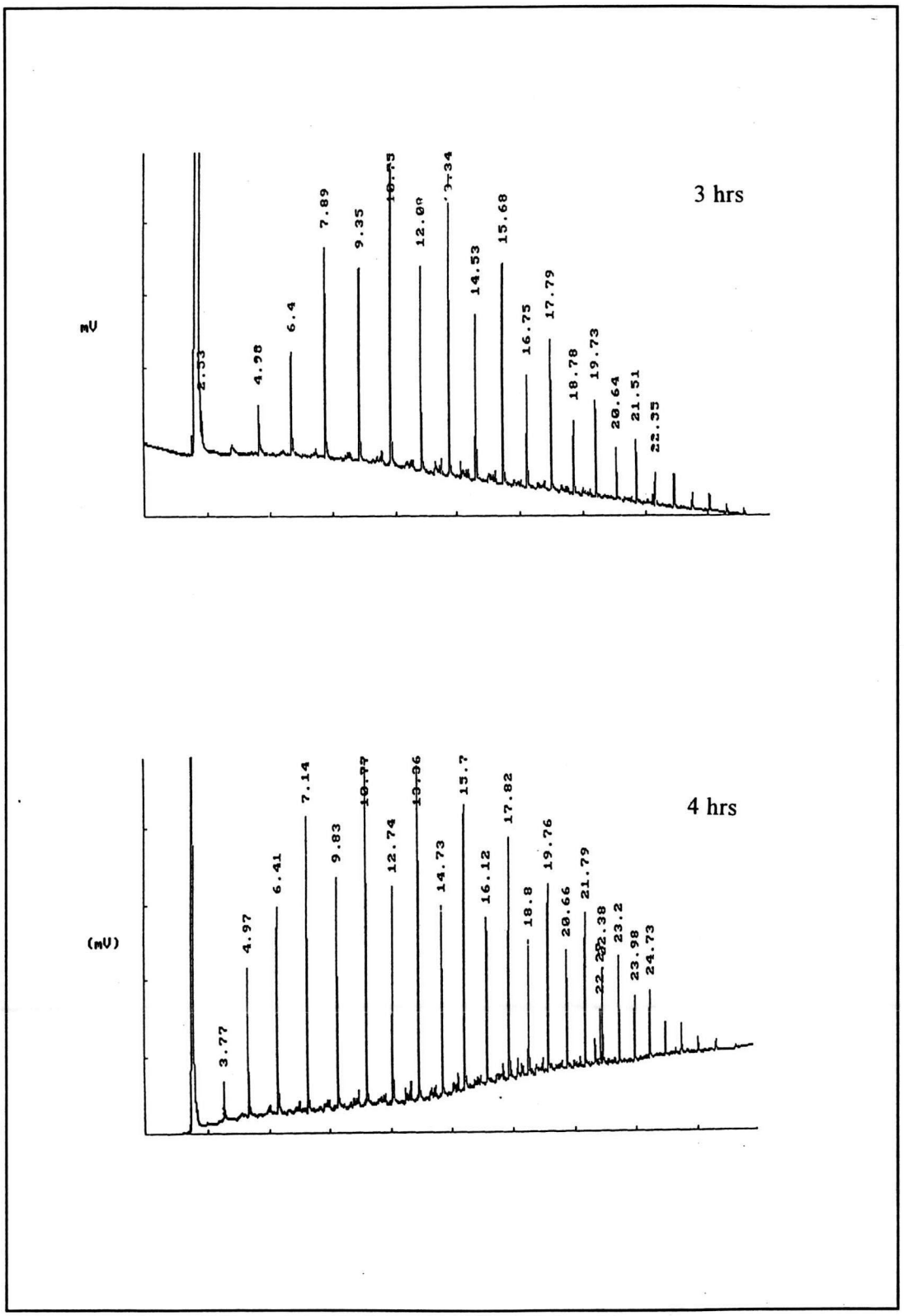

Figure B5 GC chromatogram of products from hydroisomerization as a function of reaction time(continued)

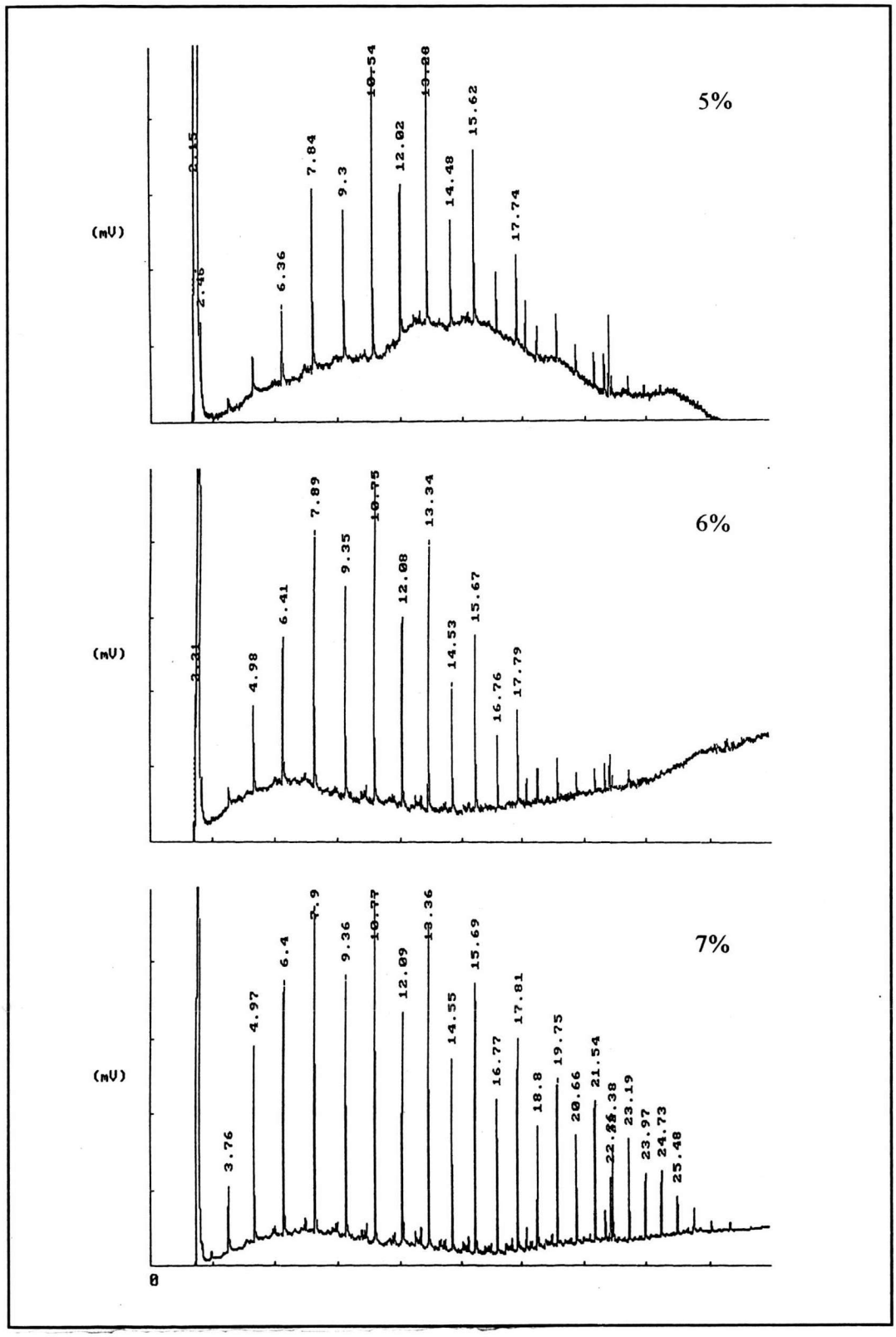

Figure B6 GC chromatogram of products from hydroisomerization as a function of catalyst concentration (second time)

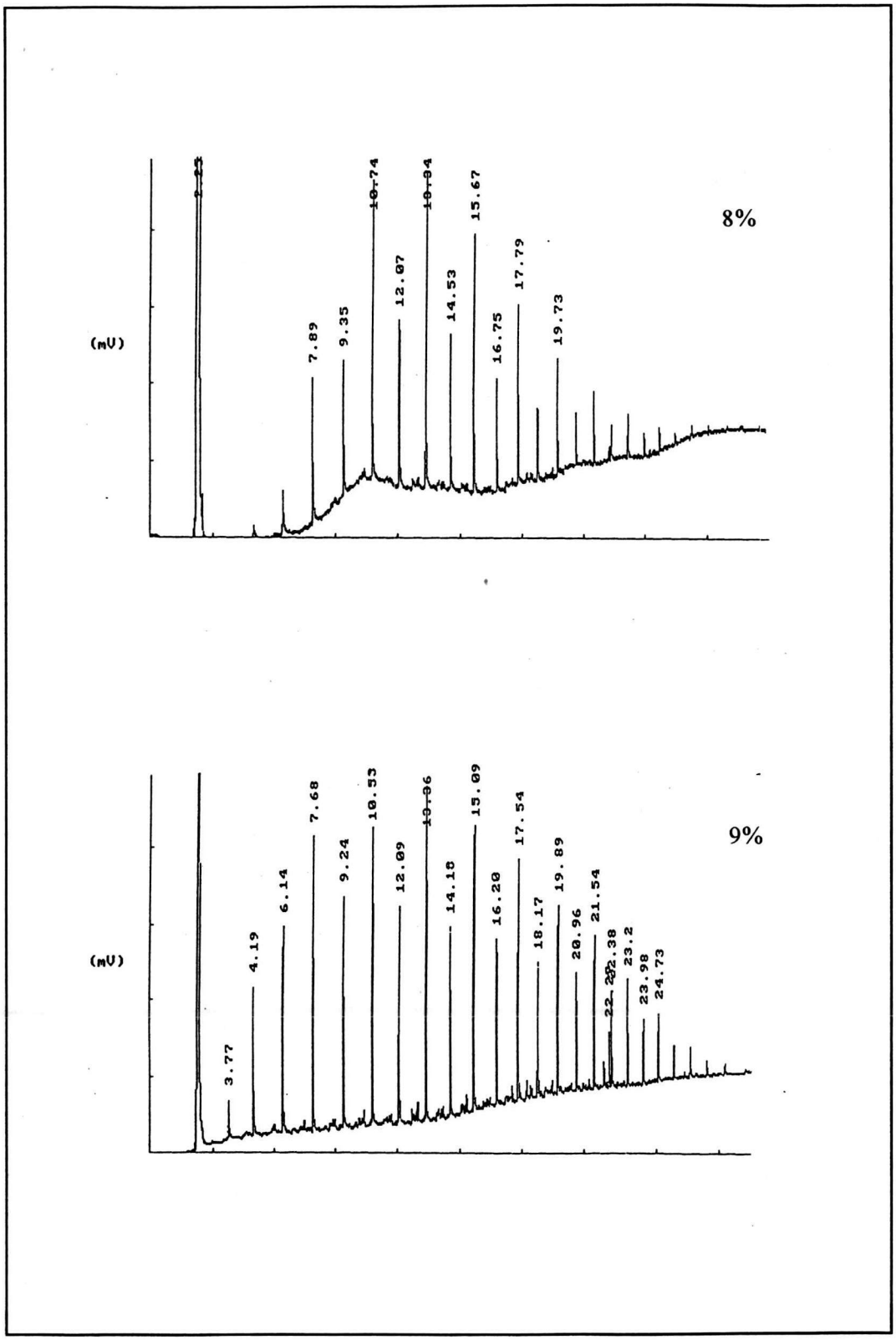

Figure B7 GC chromatogram of products from hydroisomerization as a function of catalyst concentration (second time)(continued)

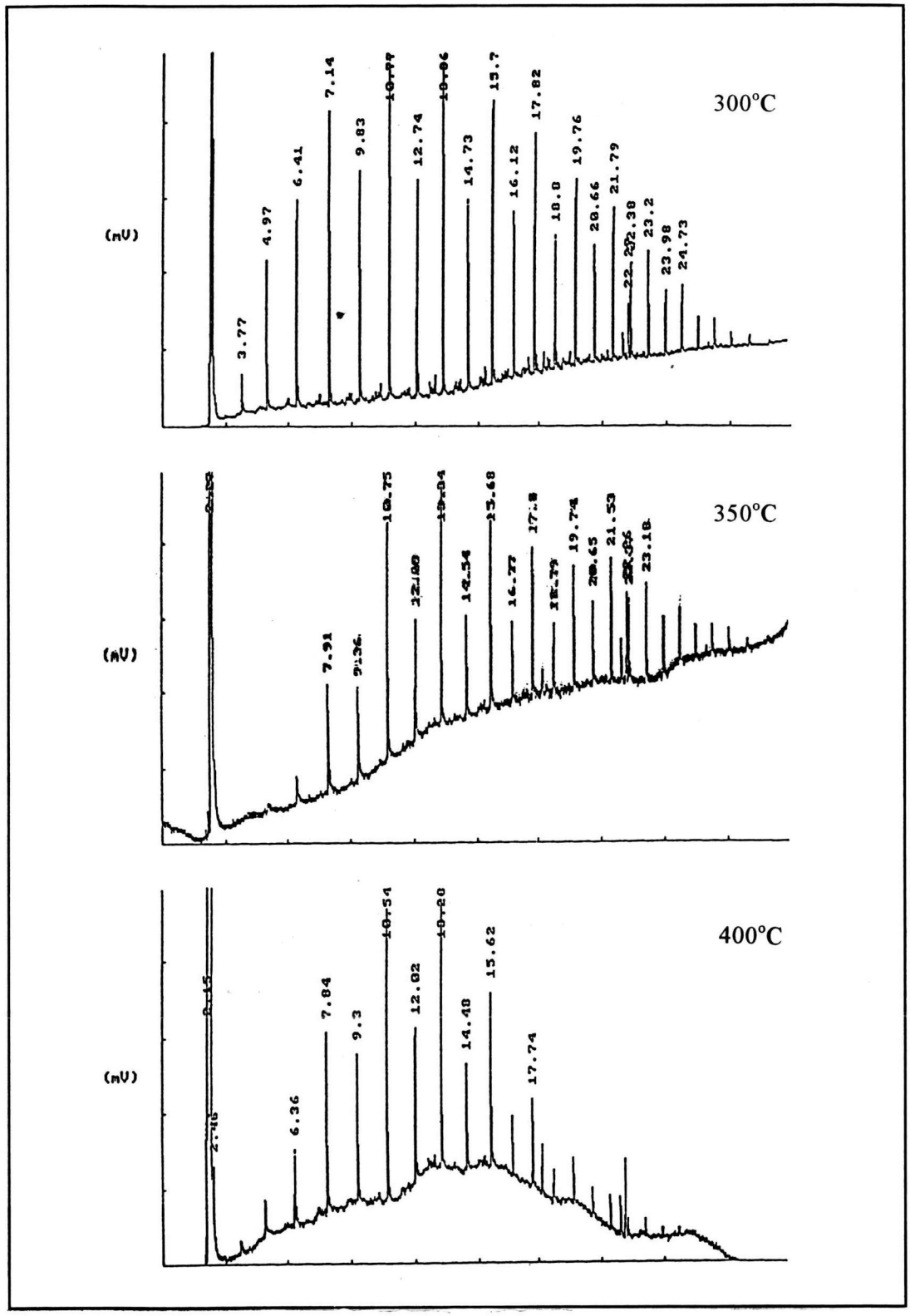

Figure B8 GC chromatogram of products from hydroisomerization as a function of temperature (second time)

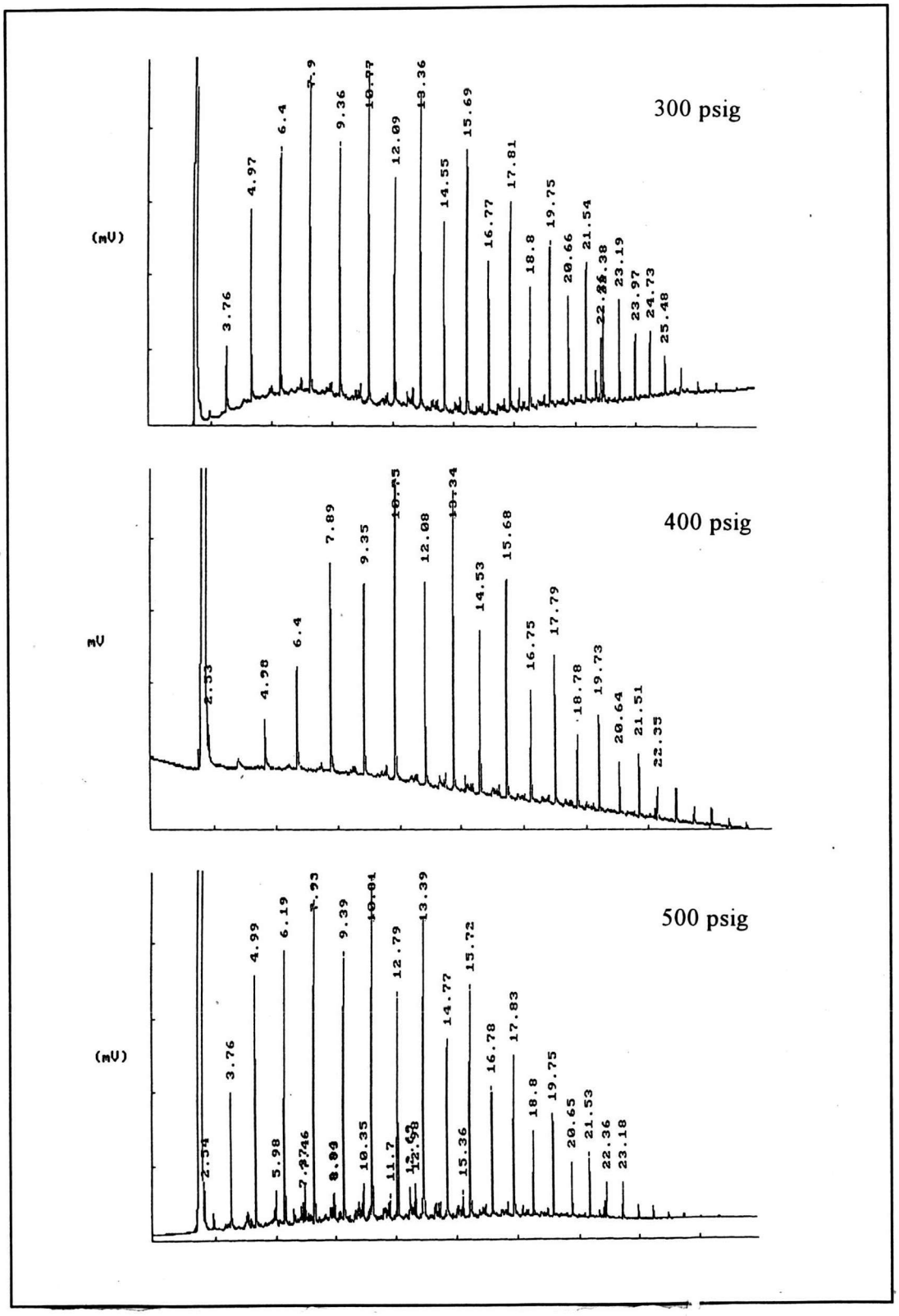

Figure B9 GC chromatogram of products from hydroisomerization as a function of hydrogen pressure (second time)

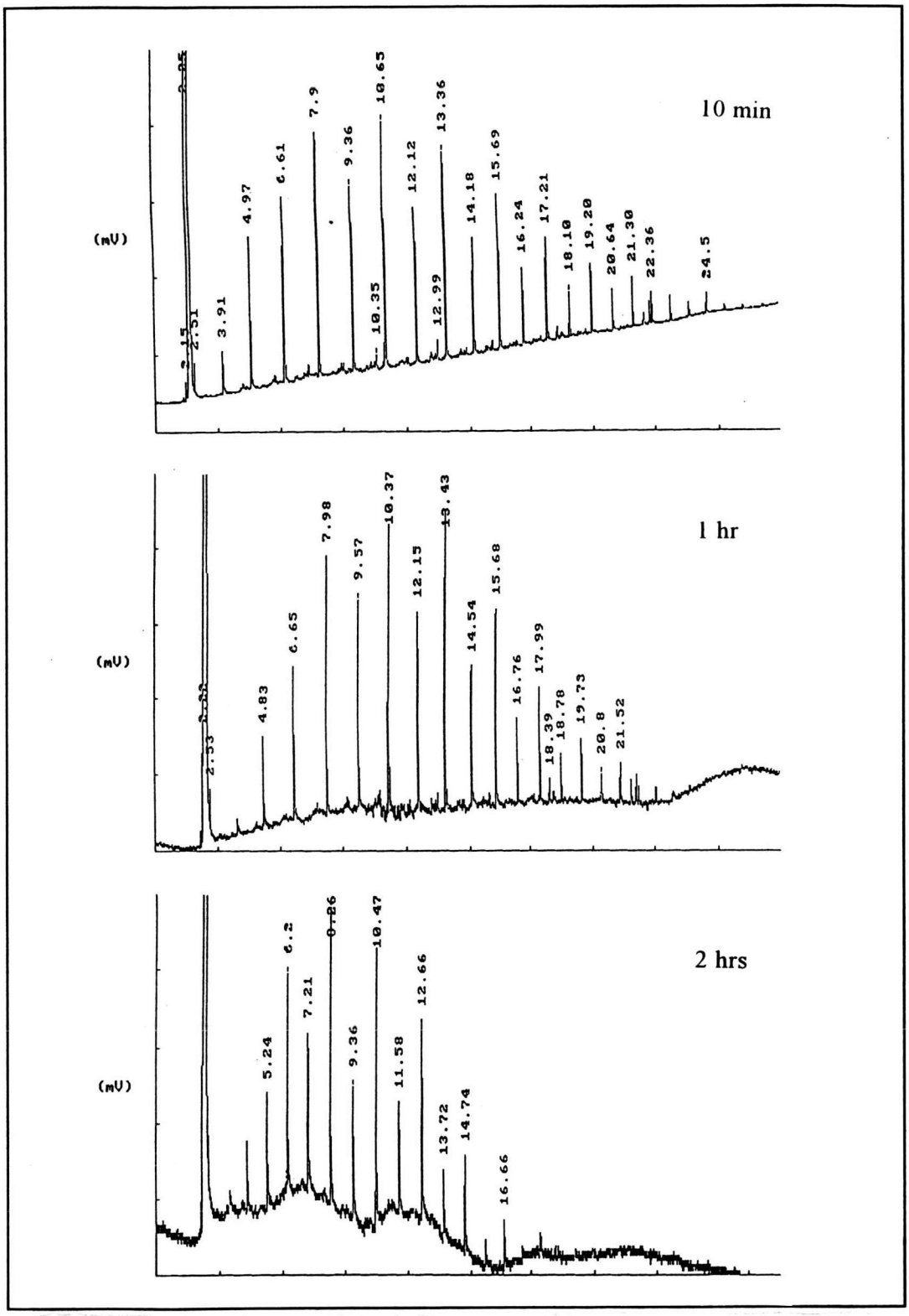

Figure B10 GC chromatogram of products from hydroisomerization as a function of reaction time (second time)

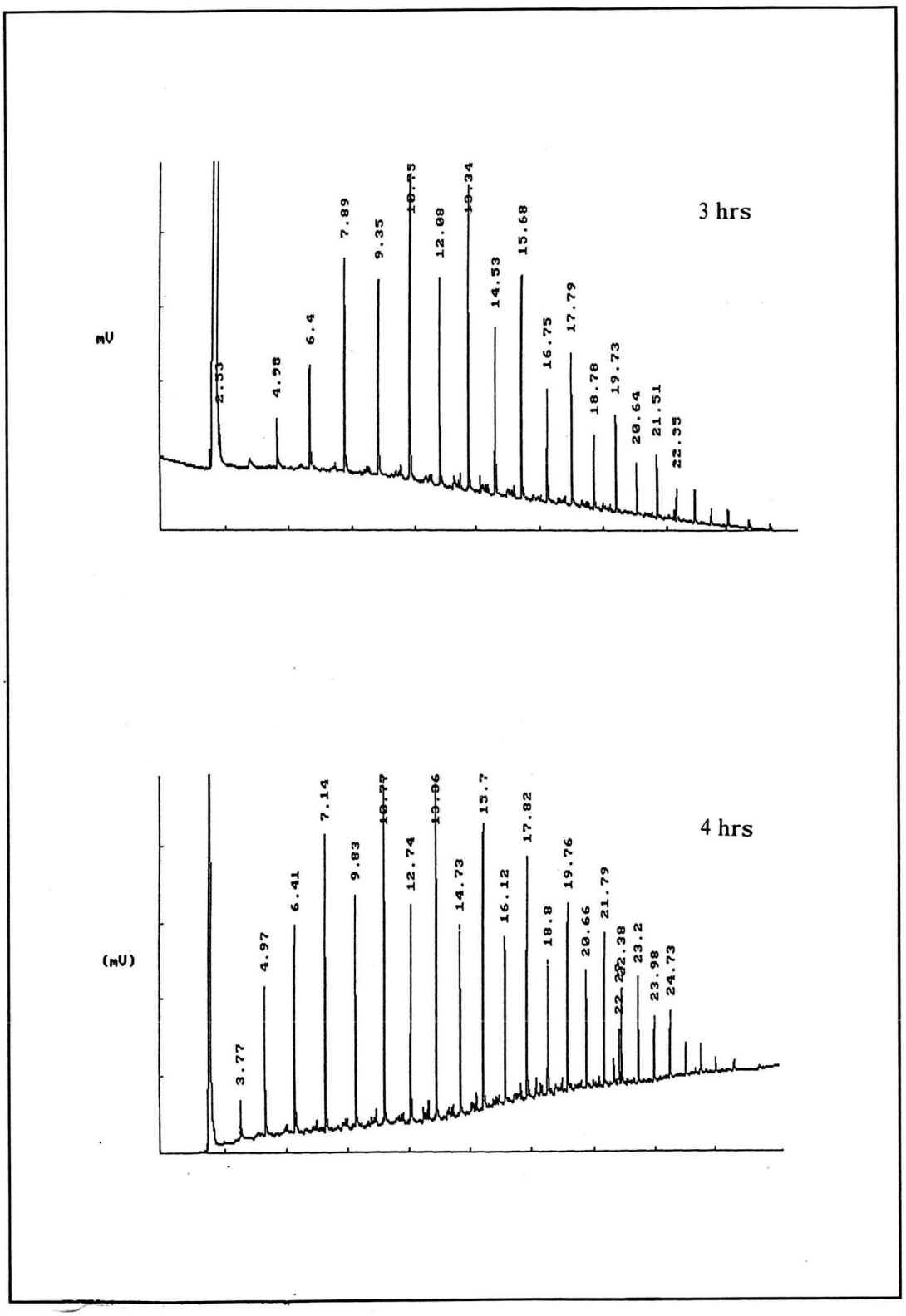

Figure B11 GC chromatogram of products from hydroisomerization as a function of reaction time (second time)(continued)

VITA

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