THE DEGRADATION OF REFRACTORY MINERAL OIL RESIDUES USING BIOREACTORS

VOLUME II OF II

by

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Thesis submitted in fulfilment of the academic requirements for the degree of Doctor of Philosophy

DEPARTMENT OF CIVIL AND BUILDING ENGINEERING

LOUGHBOROUGH UNIVERSITY

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VOLUME II

APPENDIX O

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SET 1 – FTIR CHROMATOGRAMS

SET 2 – TRACER CHARTS

SET 3 – HPLC CHROMATOGRAMS

SET 1 – FTIR CHROMATOGRAMS

- EXTRACTION AND MEASUREMENT OF OIL AND GREASE IN THE PRESENCE OF SURFACTANT
  - STANDARDS
  - SAMPLE WITH SURFACTANT

- SELECTION OF HIGHEST DEGRADATION RATE ENHANCER
  - DAY 0 AND 2
  - DAY 5 AND 8
  - DAY 12

- TESTING THE ADDITION OF SURFACTANT TO SLUDGE OR MIXED LIQUOR

EXTRACTION AND MEASUREMENT OF O&G IN THE PRESENCE OF SURFACTANT

Range of standard weights prepared from extracted O&G from sludge, dissolved in 10 mls TCTFE

No.	1	2	3	4	5
g	0.0071	0.0665	0.1997	0.2619	0.332

Std no 1	0.0071
peak, (cm-1)	absorption
2856.8	0.0155
2929.8	0.0748
2956.8	0.0166
total abs	0.1069

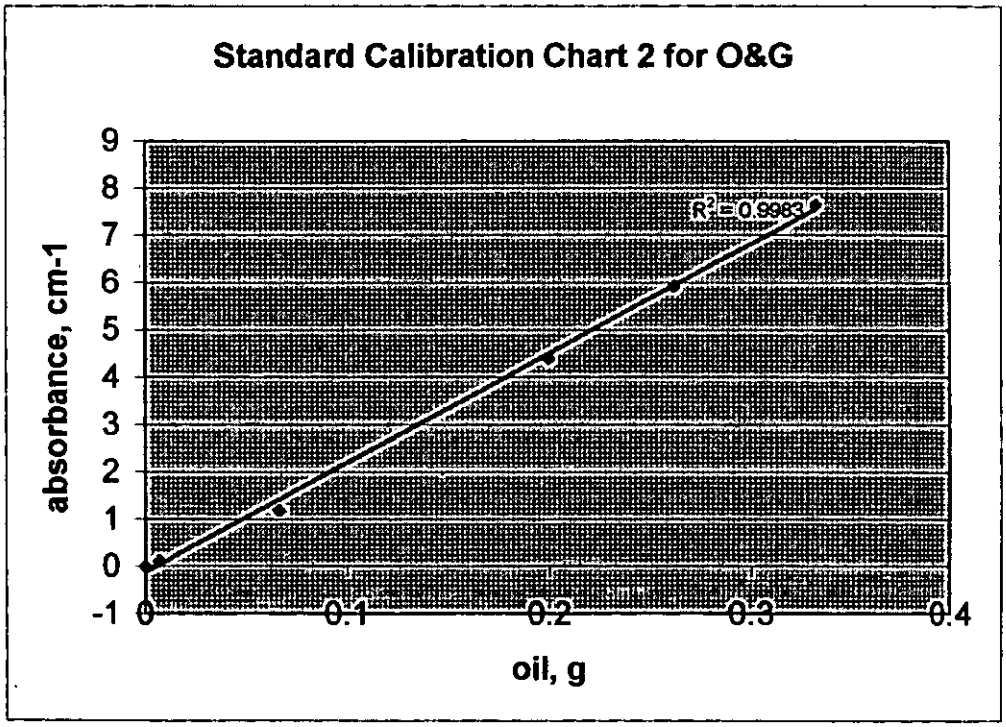
Std no 2	0.0665
peak, (cm-1)	absorption
2856	0.2835
2927.6	0.6315
2957.5	0.2777
total abs	1.1927

Std no 3	0.1997
peak, (cm-1)	absorption
2856	1.159
2932.9	2.0483
2952.1	1.1864
total abs	4.3937

Std no 4	0.2619
peak, (cm-1)	absorption
2857.1	1.7582
2934	2.4967
2955	1.67
total abs	5.9239

Std no 5	0.332
peak, (cm-1)	absorption
2851.7	1.7184
2860.3	1.7121
2935	2..1181
2959.6	2.1068
total abs	7.6554

oil, g	0	0.0071	0.0665	0.1997	0.2619	0.332
abs cm -1	0	0.1069	1.1927	4.3937	5.9239	7.6554



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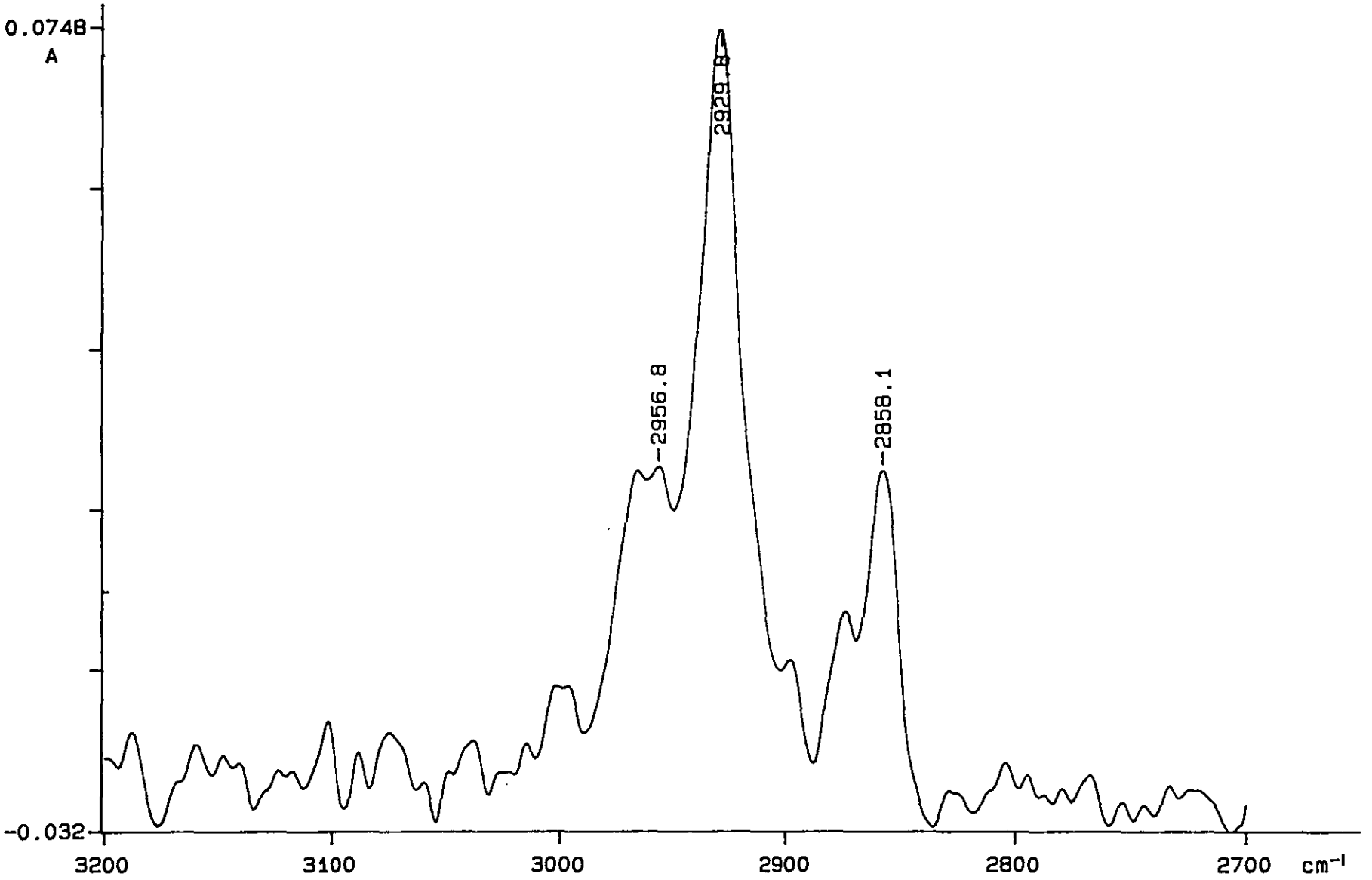
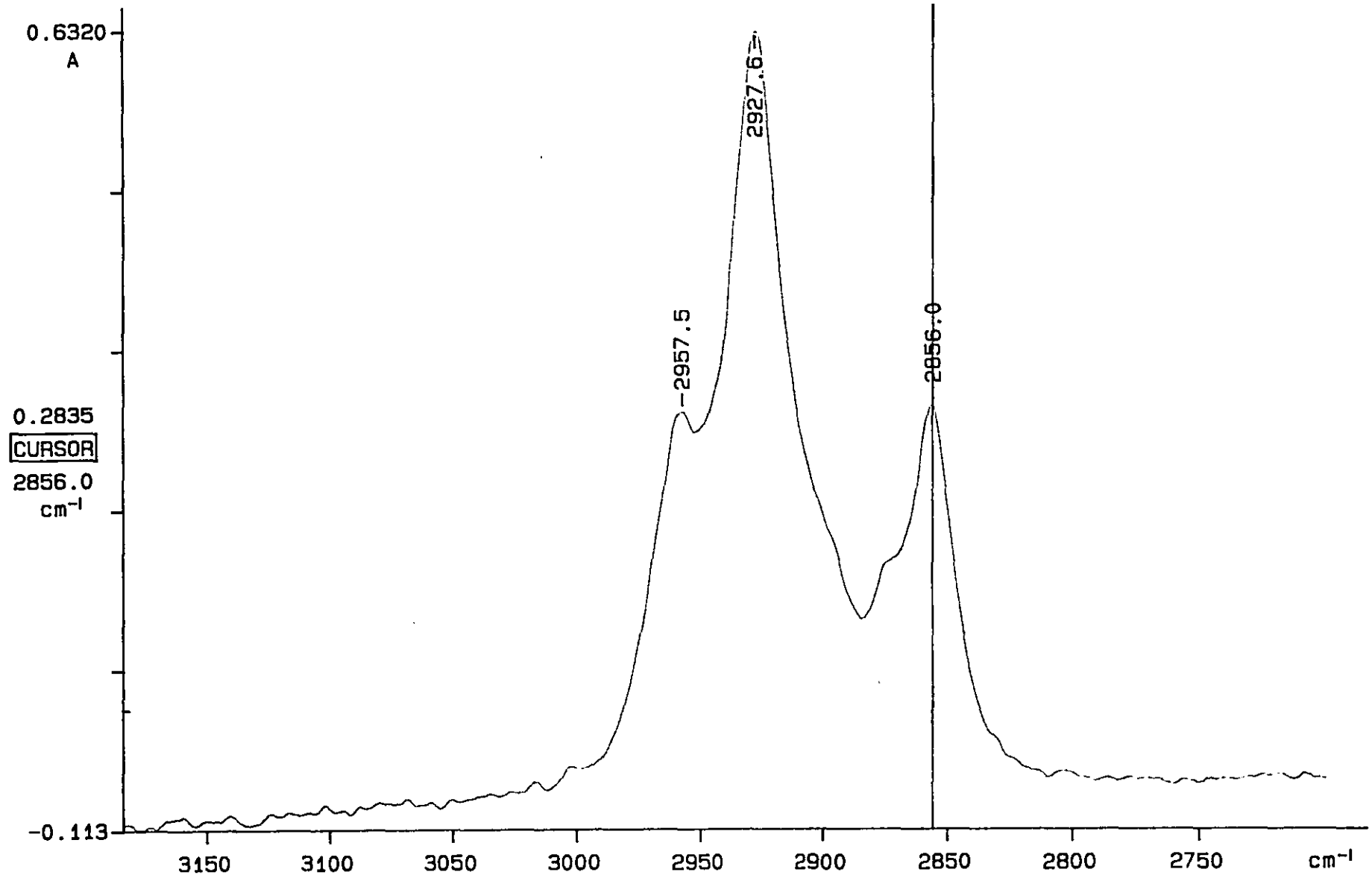


96/08/07 14:08 S.H. Osman
Y: 16 scans, 4.0cm-1, single, diff, flat, smooth, deconv
std 1

PERKIN ELMER



96/05/30 12:35 Loughborough Univ
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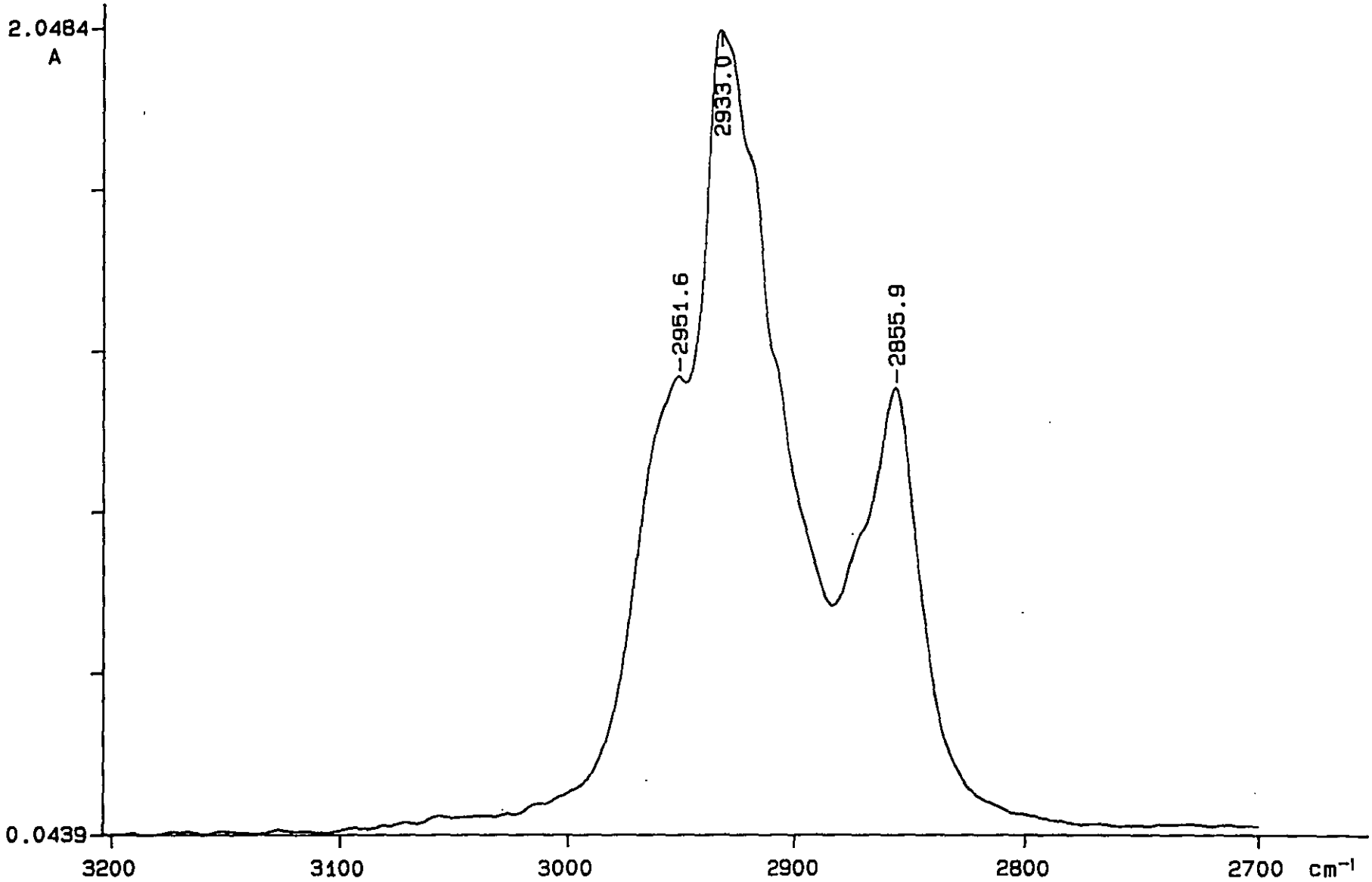

96/05/30 14:06 Loughborough Univ
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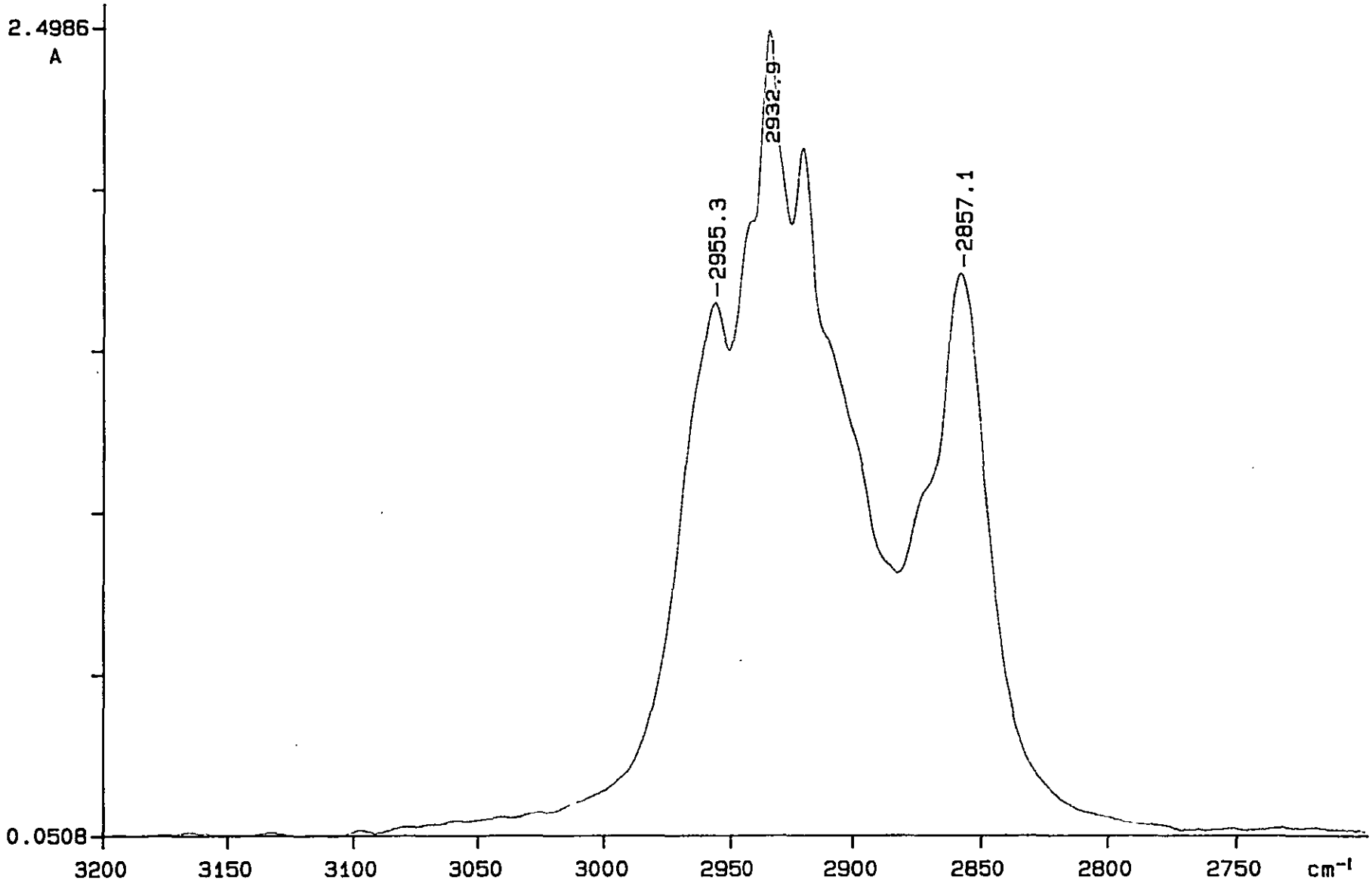
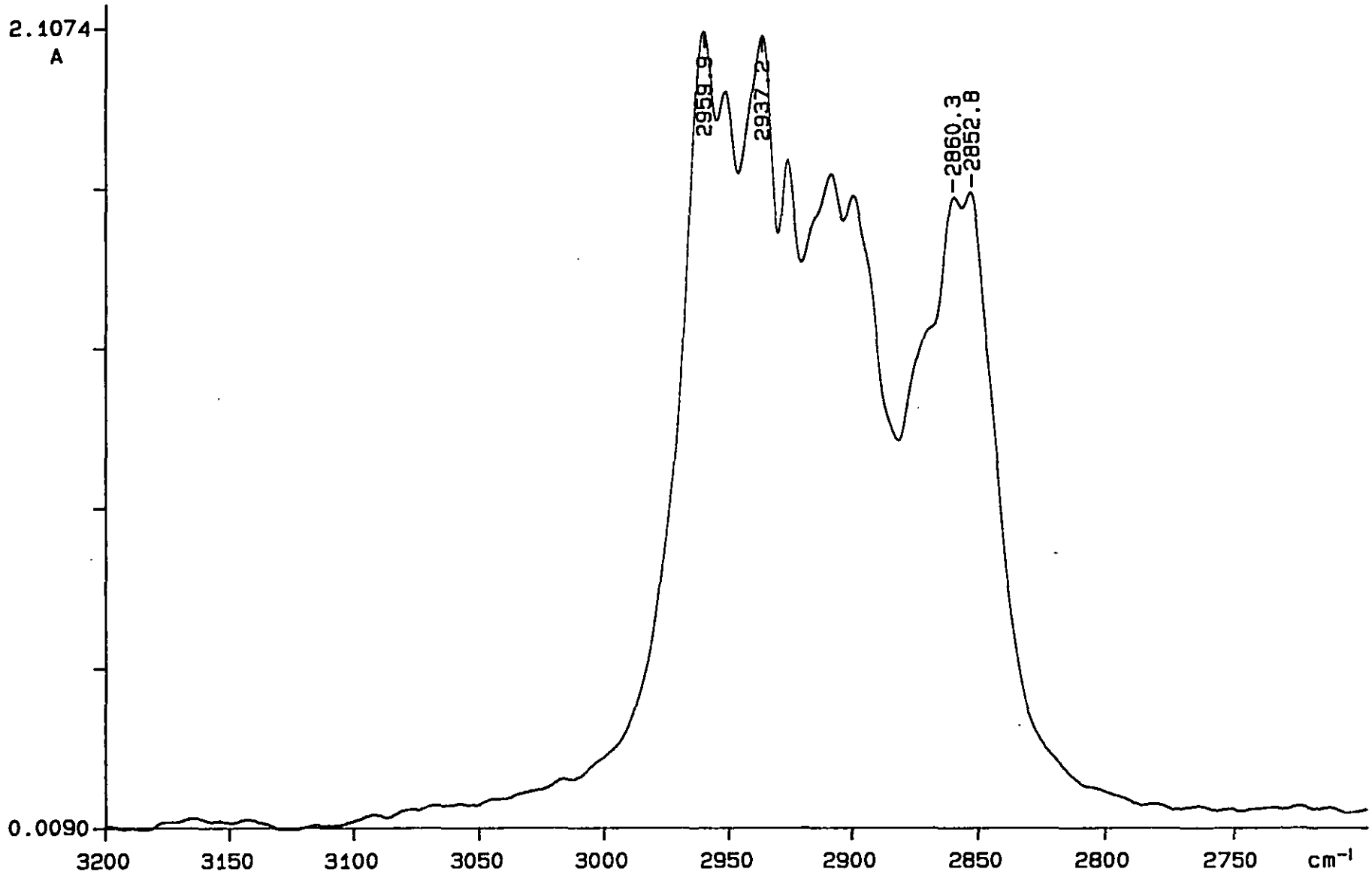
PERKIN ELMER



96/05/30 15:39 Loughborough Univ
Y: 4 scans, 4.0cm-1, single, diff, smooth

PERKIN ELMER



96/08/07 14:17 S.H. Osman
Y: 1 scan, 4.0cm-1, single, diff, smooth
.332

EXTRACTION AND MEASUREMENT OF O&G IN THE PRESENCE OF SURFACTANT

Determination of O&G using FTIR absorption from samples with added surfactants

samples in 10 mls TCTFE		amt in subsample
1B	Brij 35 and 0.7184 g oil	0.1197
2B	Brij 35 and 0.7318 g oil	0.122
3S	Sapogenat and 0.7039 g oil	0.1173
4S	Sapogenat and 0.7159 g oil	0.1193
5I	Inipol and 0.7050 g oil	0.1175
6I	Inipol and 0.7320 g oil	0.122

sample 1B	0.1197 g oil
peak, (cm-1)	absorption
2957.5	0.7405
2928.6	1.3655
2857.1	0.7118
total abs	2.8178

sample 2B	0.122g oil
peak, (cm-1)	absorption
2957.5	0.7551
2928.6	1.433
2857.1	0.7367
total abs	2.9248

sample 3S	0.1173 g oil
peak, (cm-1)	absorption
2957.5	0.779
2928.6	1.4662
2857.1	0.7578
total abs	3.003

sample 4S	0.1193 g oil
peak, (cm-1)	absorption
2957.5	0.7449
2928.6	1.4189
2857.1	0.729
total abs	5.131

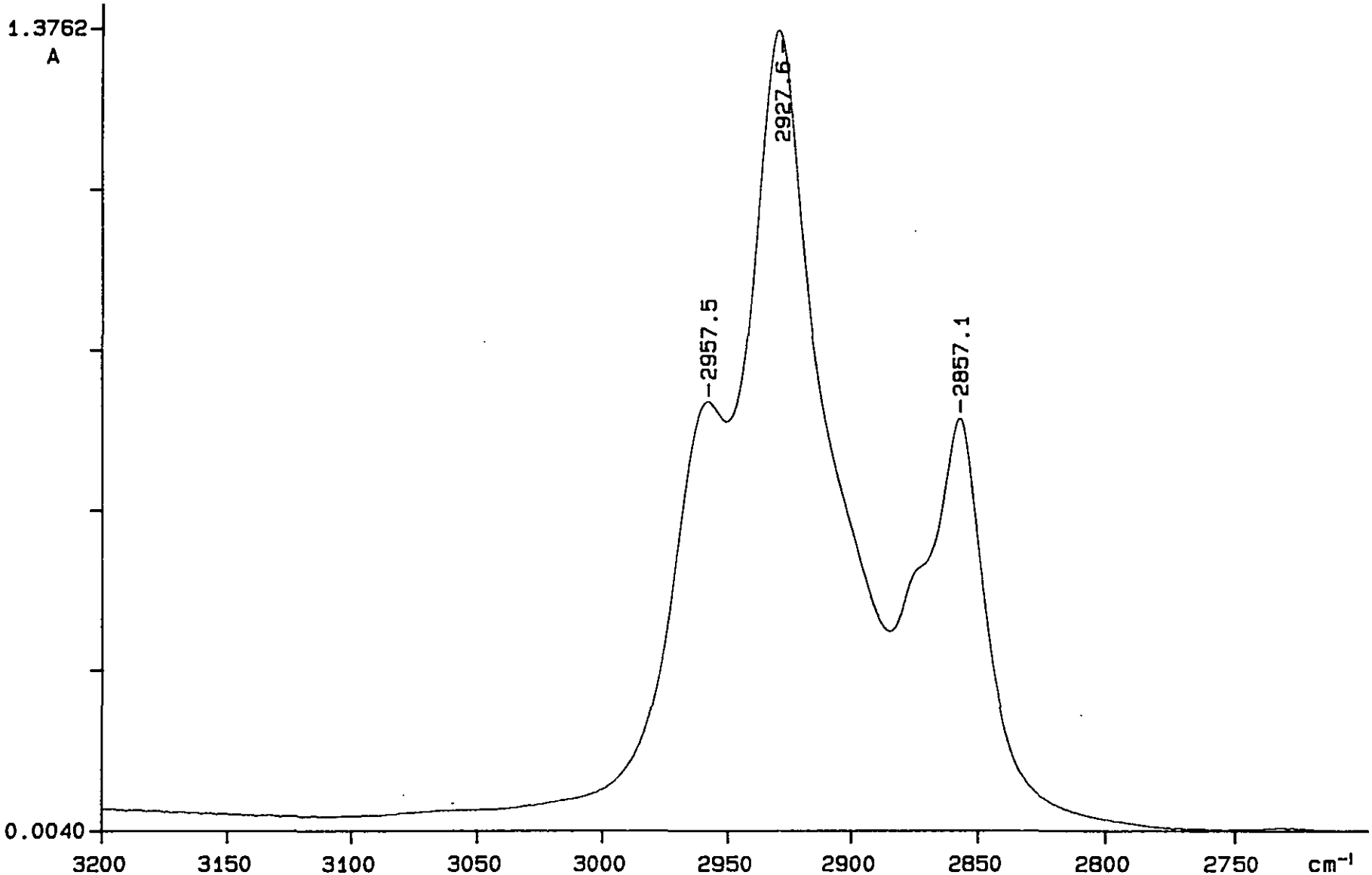
sample 5I	.1175 g oil
peak, (cm-1)	absorption
2957.5	0.8671
2928.6	1.6485
2857.1	0.8674
total abs	3.383

sample 6L	0.122 g oil
peak, (cm-1)	absorption
2957.5	0.8506
2929.6	1.6099
2857.1	0.8497
total abs	3.3102

Conversion of absorbance to oil content based on calibration standard curve 1

sample	oil	abs	extrapolate O&G		% recovery
1B	0.1197	2.8178	0.112 g		93.57
2B	0.122	2.9248	0.116 g		95.08
3S	0.1173	3.003	0.118 g		100.6
4S	0.1193	5.131	0.114 g		95.56
5I	0.1175	3.383	0.120 g		102.13
6I	0.122	3.3102	0.124 g		101.64

PERKIN ELMER



96/08/14 13:02 S.H. Osman
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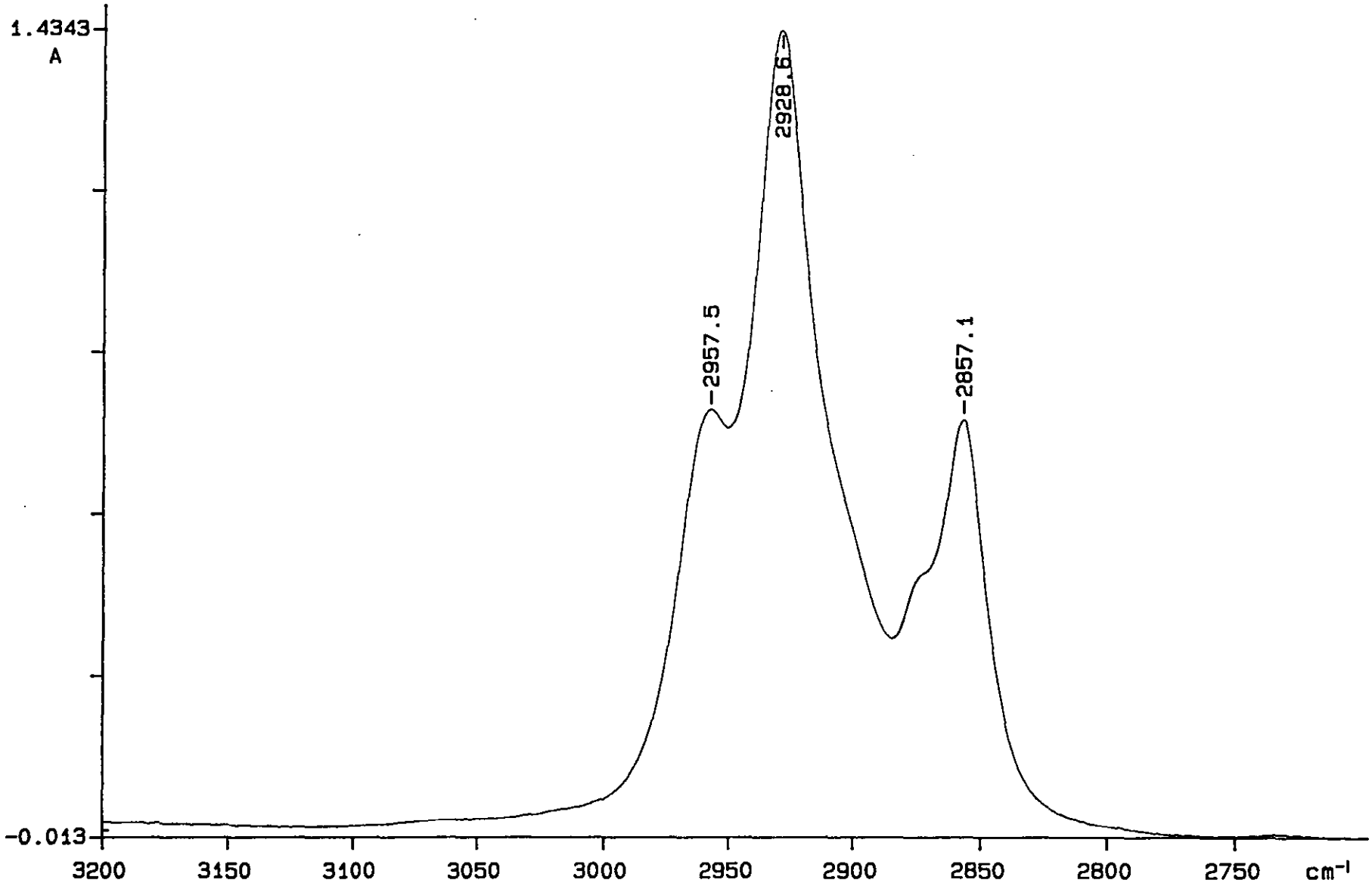

96/08/14 13:07 S.H. Osman
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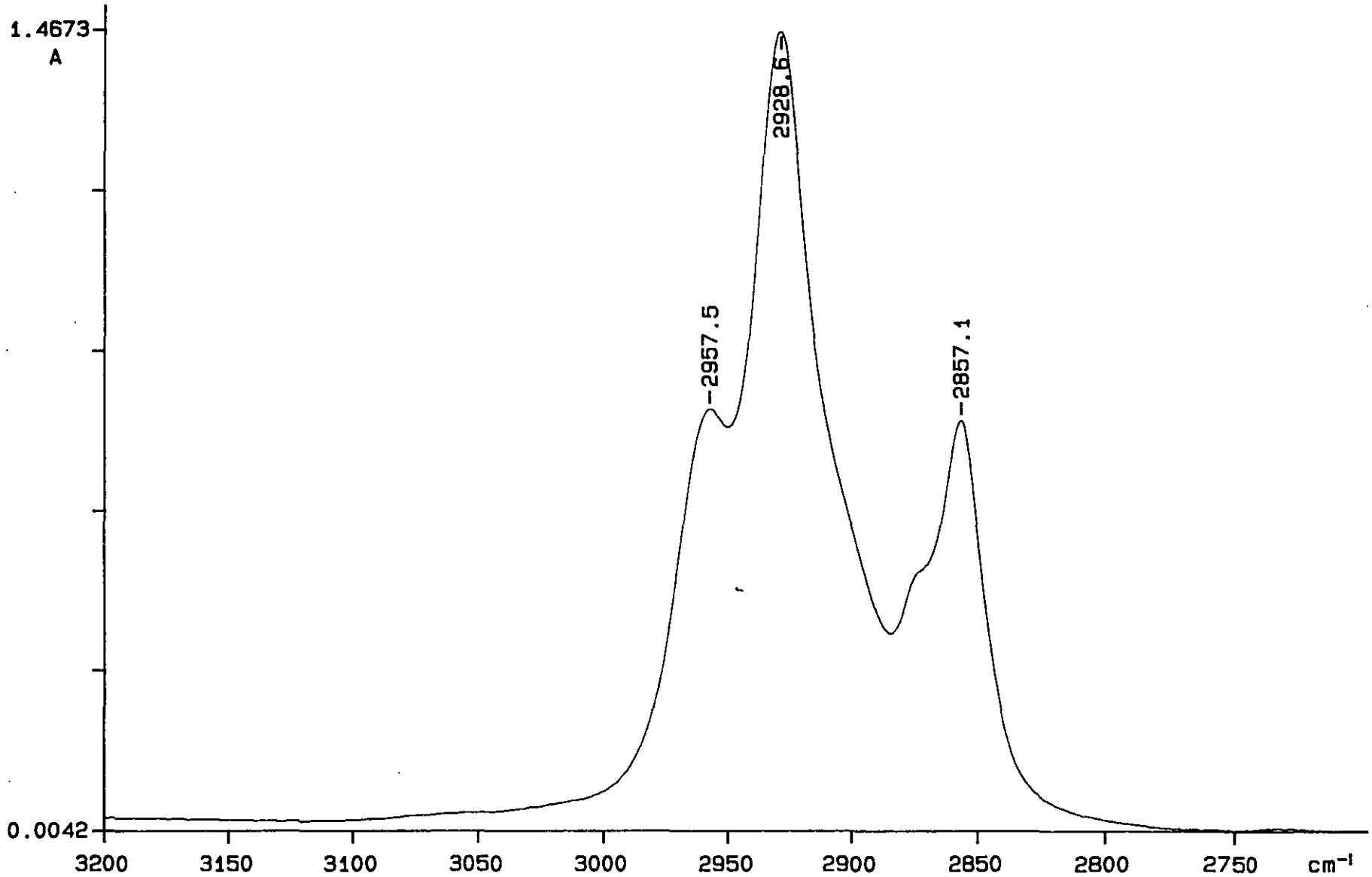
PERKIN ELMER



96/08/14 13: 13 S.H. Osman
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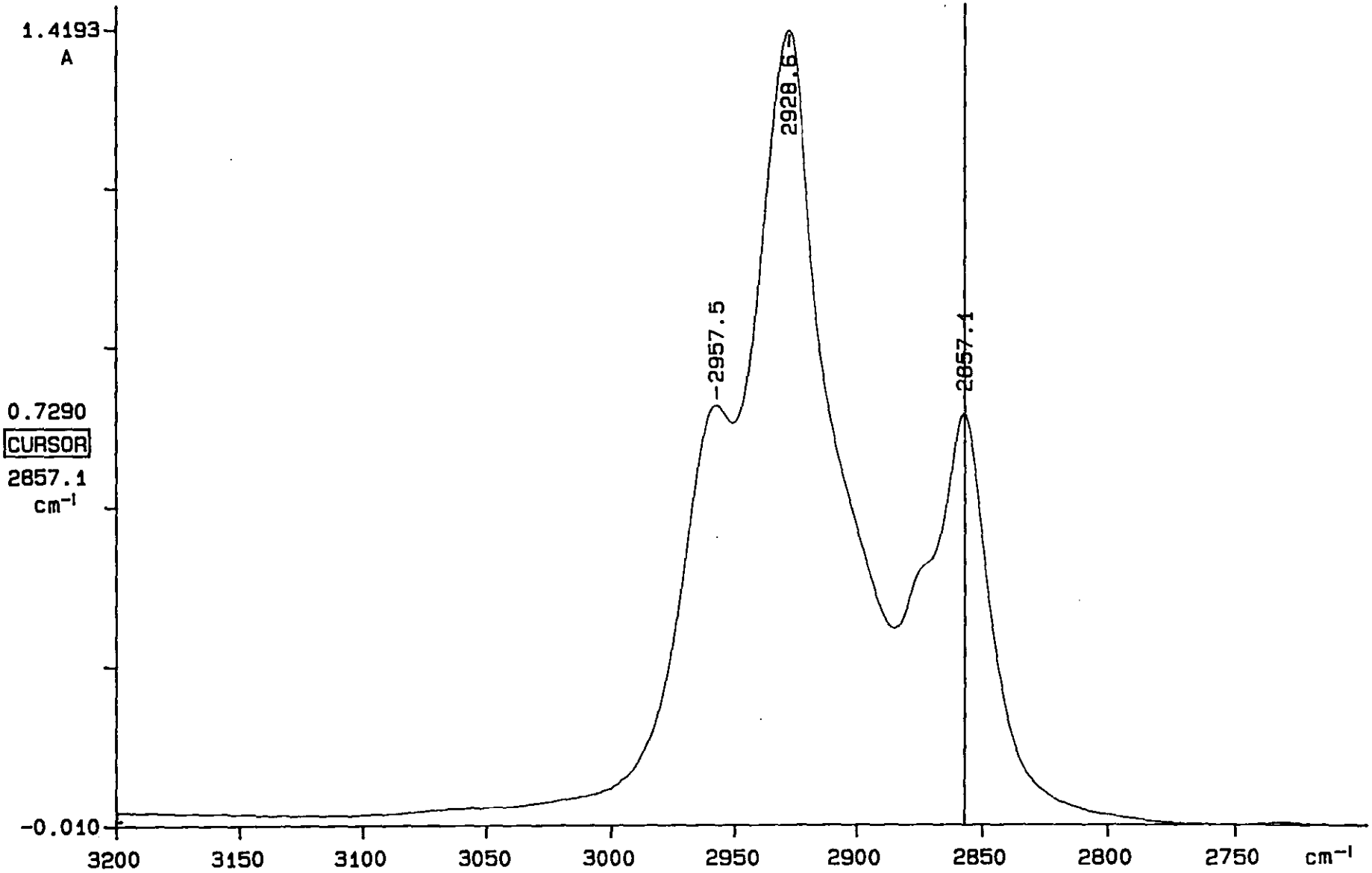
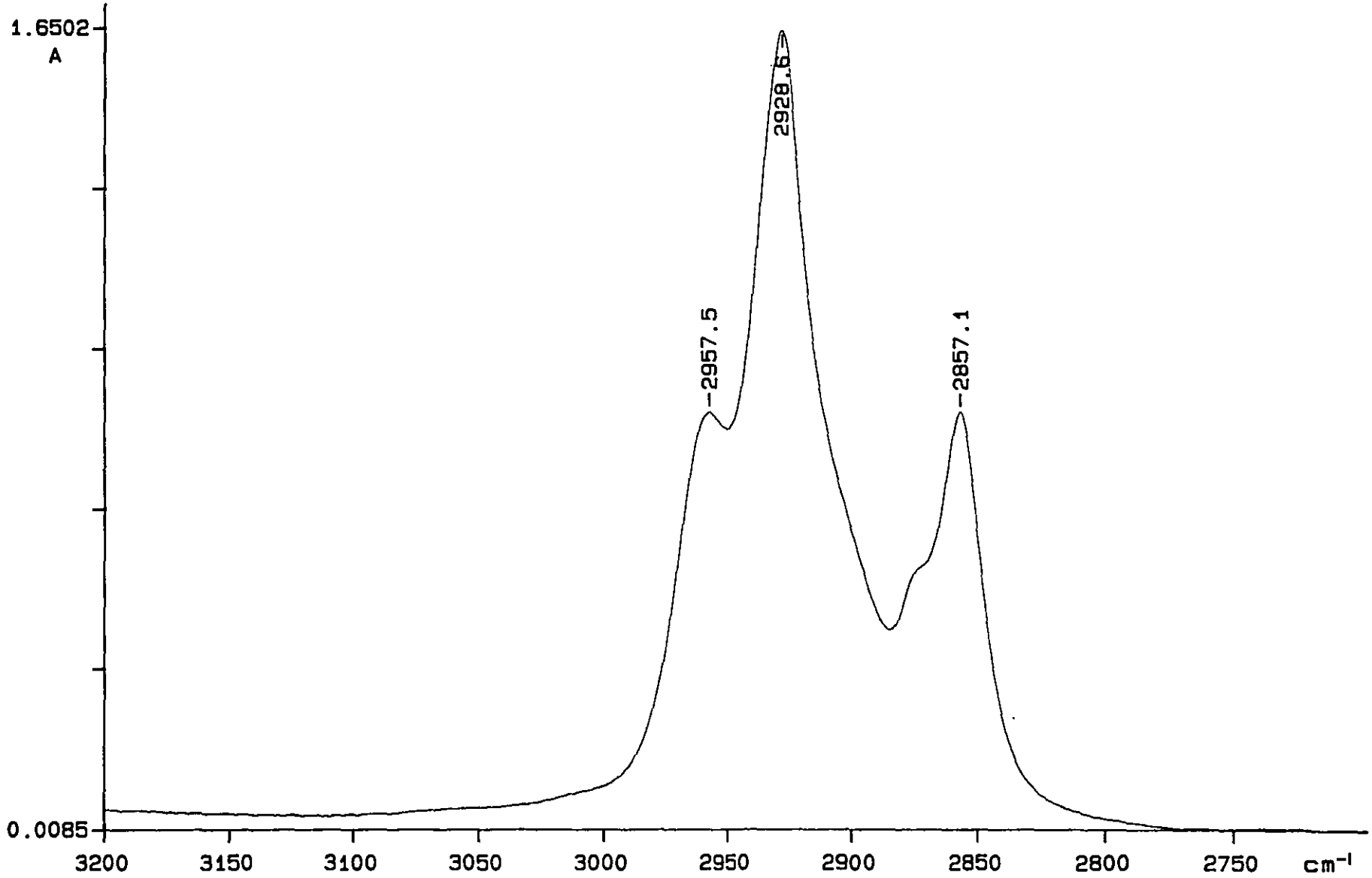


96/08/14 13:17 S.H. Osman
ymrsstd2: 16 scans, 4.0cm-1, single, diff, flat, smooth

PERKIN ELMER



96/08/14 13:21 S.H. Osman
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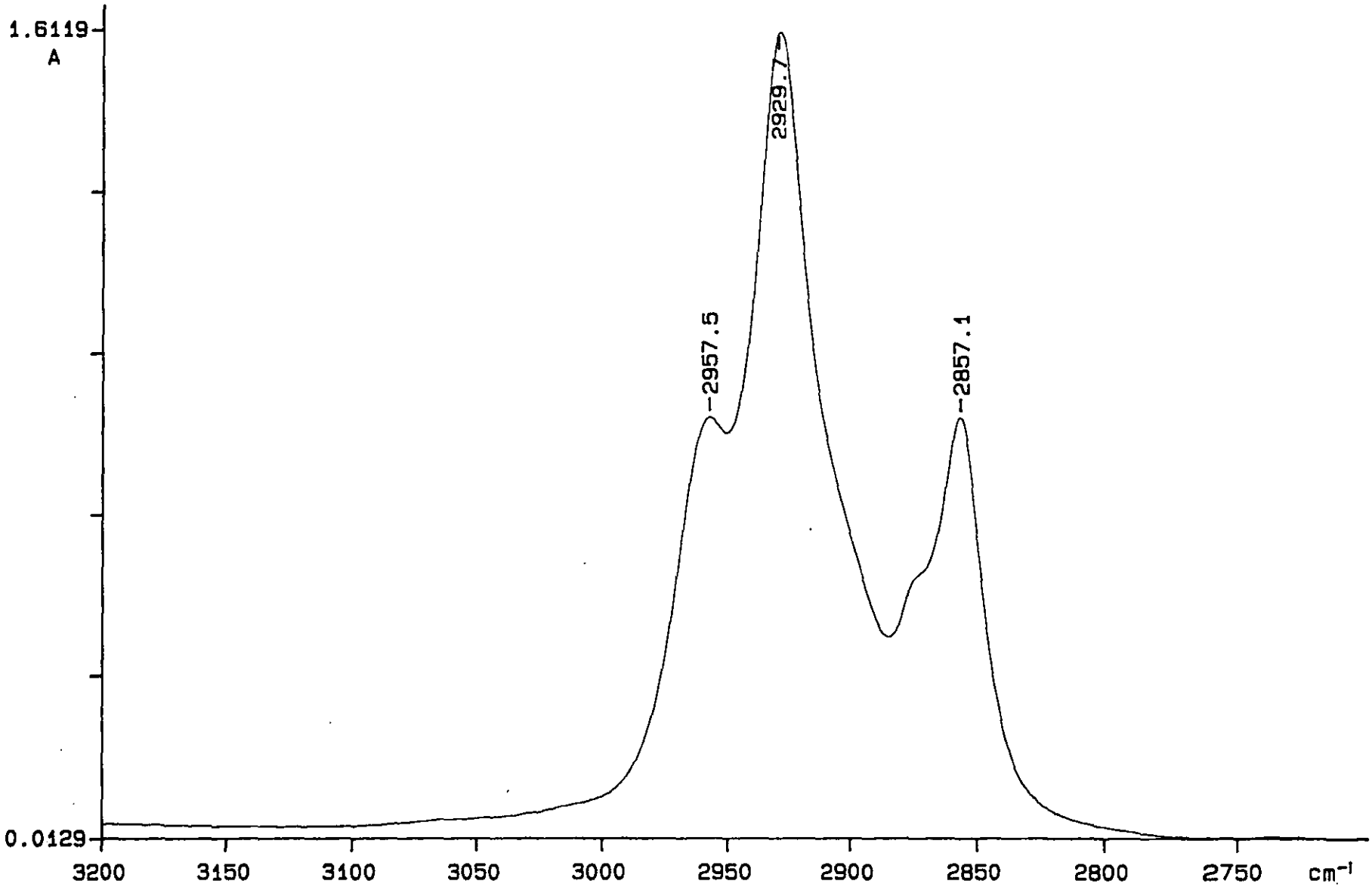


96/08/14 13:28 S.H. Osman
ymristd2: 16 scans, 4.0cm-1, single, diff, flat, smooth

SELECTION OF HIGHEST DEGRADATION RATE ENHANCER

Surfactant selection

DAY 0

sample 1B	
peak, (cm-1)	absorption
2957.5	0.7924
2928.6	1.5426
2857.1	0.8124
total abs	3.1474

sample 2B	
peak, (cm-1)	absorption
2957.5	1.0169
2928.6	1.8583
2857.1	1.0354
total abs	3.9106

sample 3S	
peak, (cm-1)	absorption
2957.5	0.6807
2928.6	1.3349
2857.1	0.6996
total abs	2.7152

sample 4S	
peak, (cm-1)	absorption
2957.5	0.6596
2928.6	1.3022
2857.1	0.6765
total abs	2.6383

sample 5I	
peak, (cm-1)	absorption
2957.5	0.7306
2928.6	1.4323
2857.1	0.7584
total abs	2.9212

sample 6L	
peak, (cm-1)	absorption
2957.5	0.9239
2929.7	1.8185
2857.1	0.9562
total abs	3.6986

sample 7C	
peak, (cm-1)	absorption
2957.5	0.5833
2928.6	0.9784
2858.1	0.4966
total abs	2.0583

sample 8C	
peak, (cm-1)	absorption
2957.5	0.7312
2928.6	1.4496
2857.1	0.7614
total abs	2.9422

Conversion of absorbance to oil content based on calibration standard curve 2

sample	total abs	average	extrapolate	O&G (g)	Corr Fact	O&G (g)
1B	3.1474					
2B	3.9106	3.529	0.158		1.06	0.16748
3S	2.7152					
4S	2.6383	2.6767	0.125		1.02	0.1275
5I	2.9212					
6I	3.6986	3.3099	0.15		0.98	0.147
7C	2.0583					
8C	2.9422	2.5003	0.115			0.115

DAY 2

sample 1B	
peak, (cm-1)	absorption
2957.9	0.6733
2928.6	1.2949
2857.1	0.6757
total abs	2.6444

sample 2B	
peak, (cm-1)	absorption
2957.5	0.703
2928.6	1.355
2857.1	0.7106
total abs	2.765

sample 3S	
peak, (cm-1)	absorption
2957.9	0.7084
2928.6	1.3357
2857.1	0.7133
total abs	2.7574

sample 4S	
peak, (cm-1)	absorption
2957.9	0.6841
2928.6	1.3179
2857.1	0.6894
total abs	2.6914

sample 5I	
peak, (cm-1)	absorption
2957.9	0.7378
2928.6	1.4053
2857.1	0.7444
total abs	2.8874

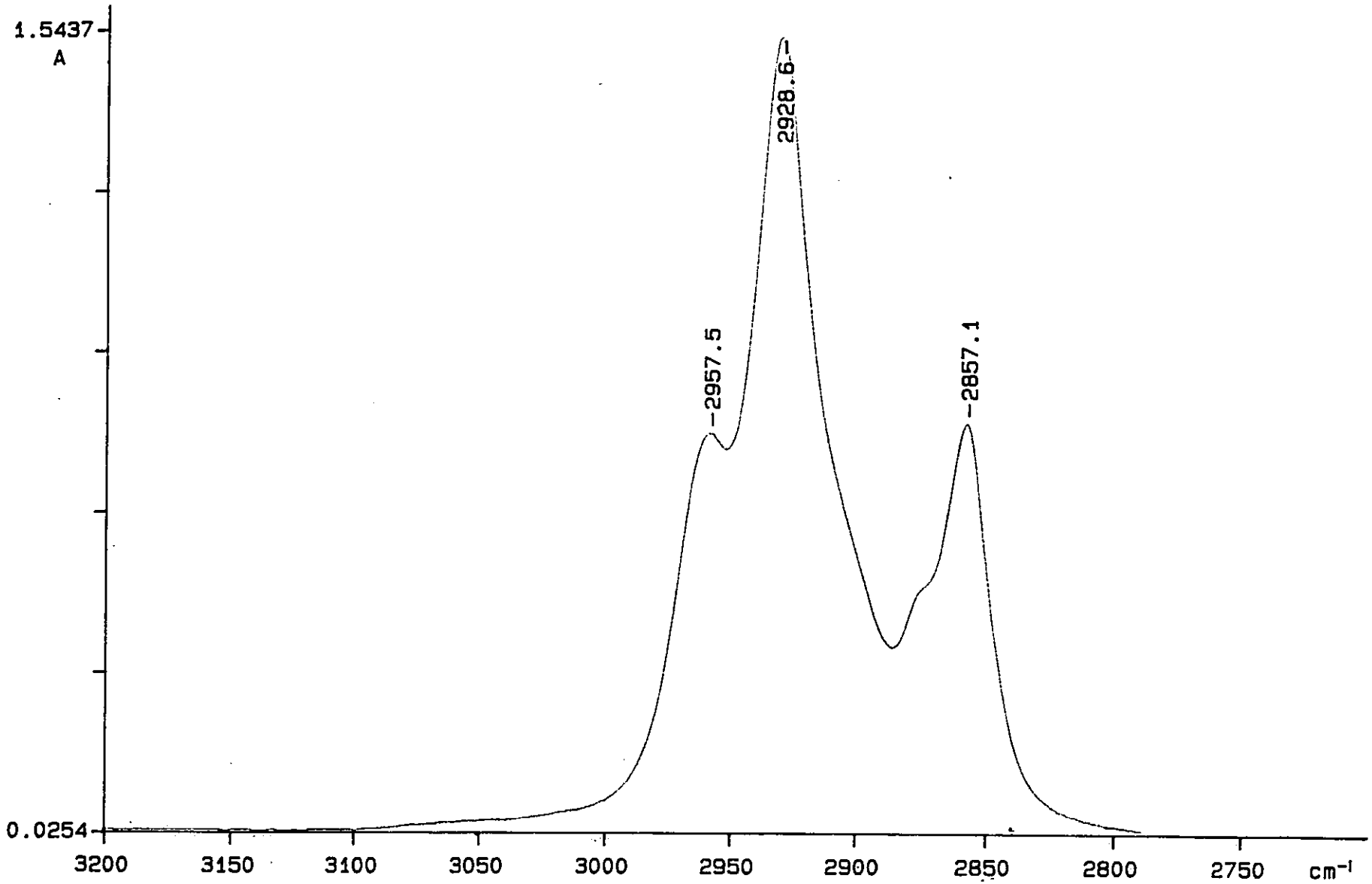
sample 6I	
peak, (cm-1)	absorption
2957.9	0.7597
2928.6	1.4389
2857.1	0.7691
total abs	2.96777

sample 7C	
peak, (cm-1)	absorption
2957.9	0.7298
2928.6	1.3368
2857.1	0.6998
total abs	2.7664

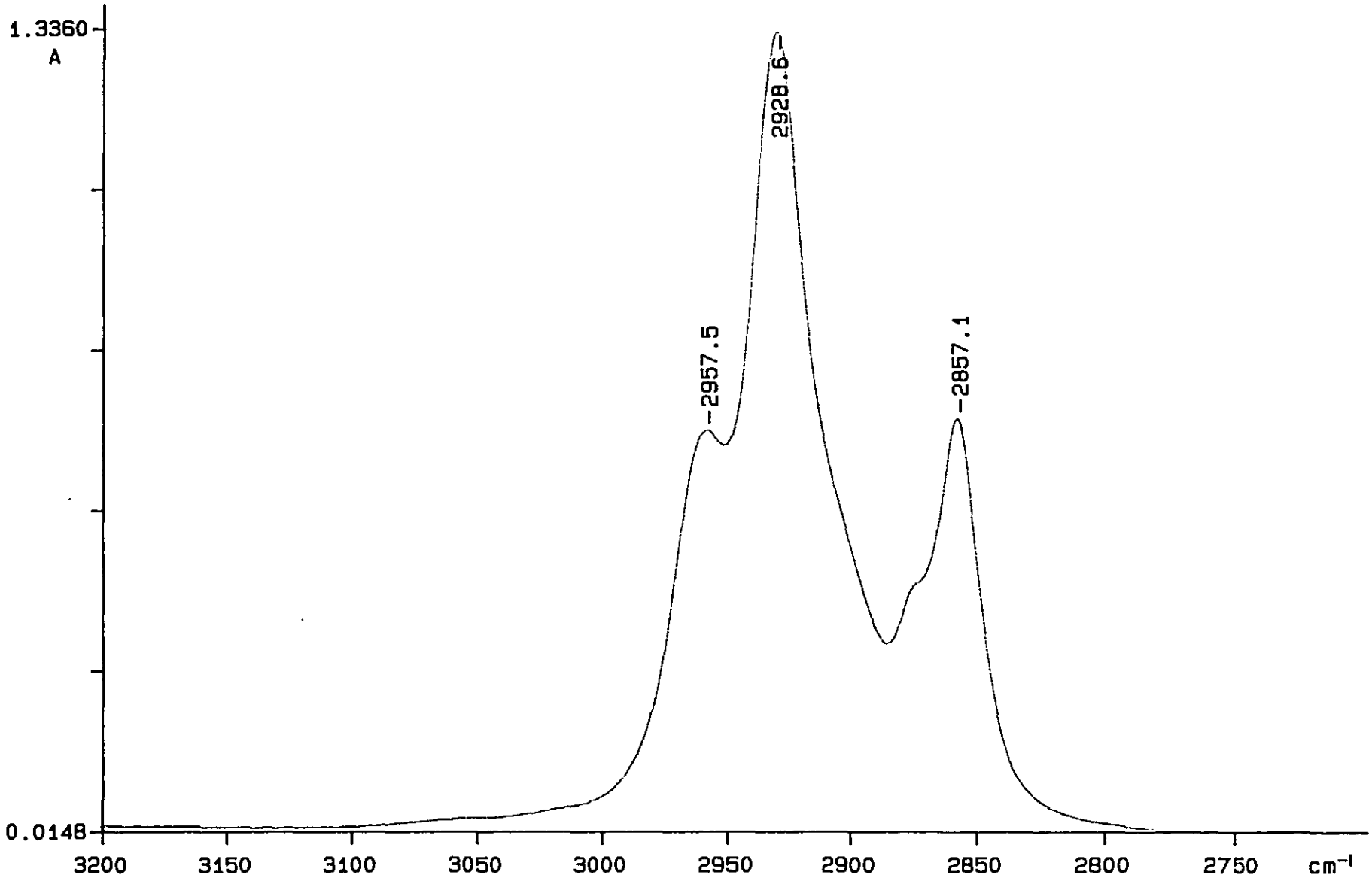
sample 8C	
peak, (cm-1)	absorption
2956.8	0.8054
2928.6	1.4752
2857.1	7708
total abs	3.0514

Conversion of absorbance to oil content based on calibration standard curve 2

sample	total abs	extrapolate	O&G (g)	Corr Fact	O&G (g)
1B	2.6444	0.12			
2B	2.765	0.128	0.124	1.06	0.1314
3S	2.7574	0.128			
4S	2.6914	0.125	0.1265	1.02	0.129
5I	2.8874	0.134			
6I	2.9677	0.136	0.135	0.98	0.1323
7C	2.7664	0.128			
8C	3.0514	0.133	0.1305		0.1305

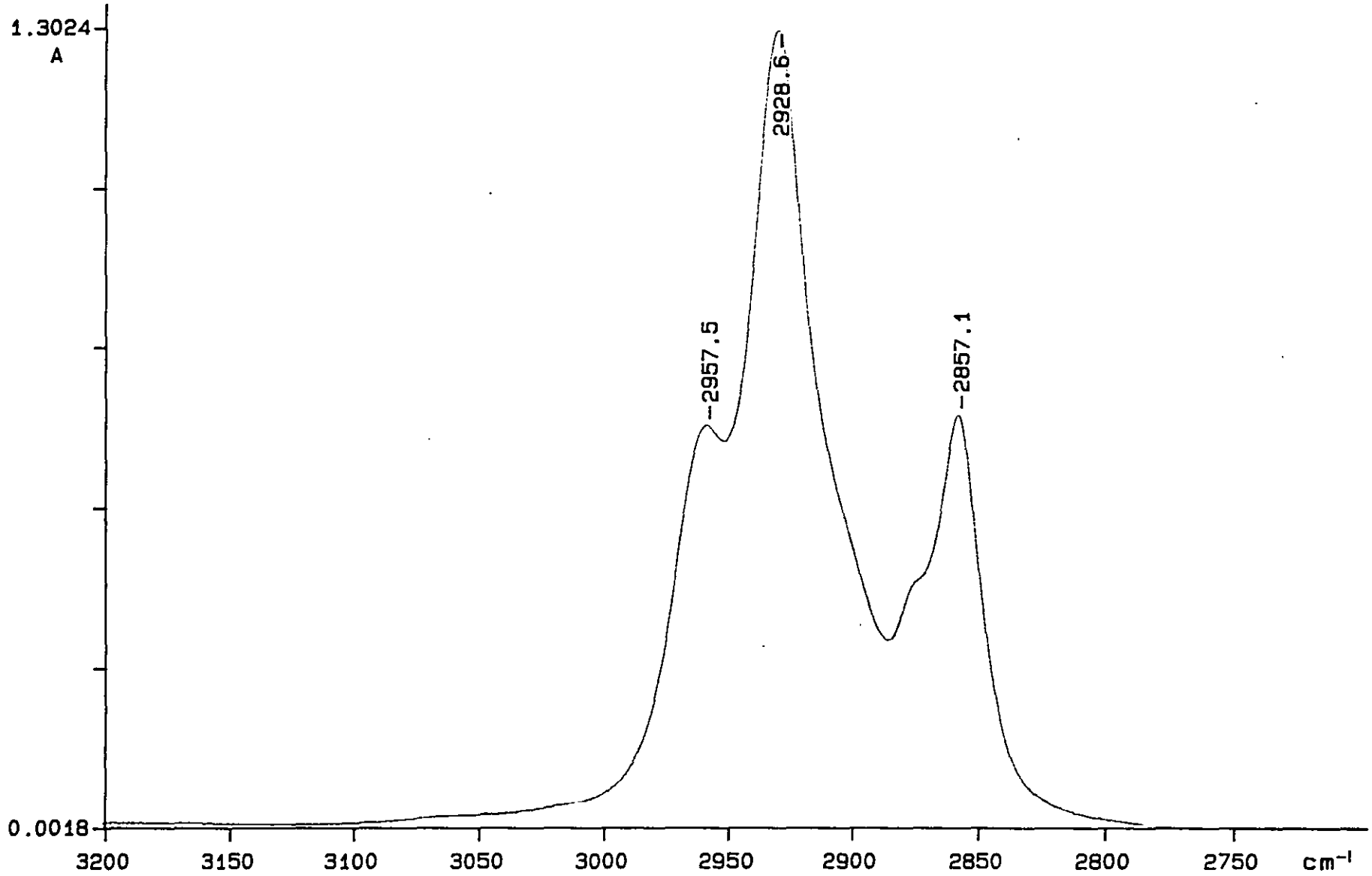


96/08/05 11:39 Loughborough Univ
ymrb0: 16 scans, 4.0cm-1, single, diff, flat, smooth

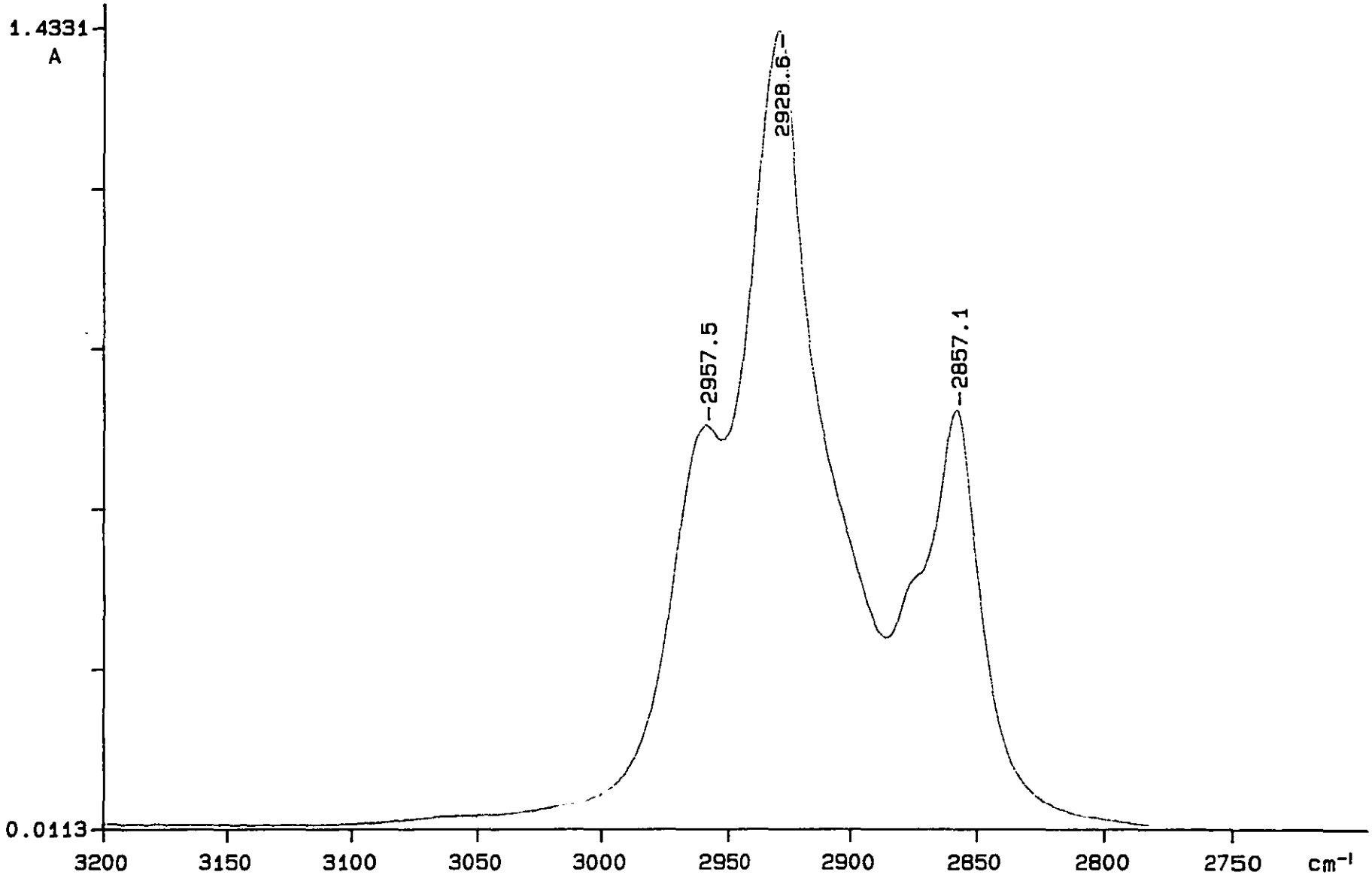


96/08/05 12:44 Loughborough Univ
ymrs0: 16 scans, 4.0cm-1, single, diff, flat, smooth

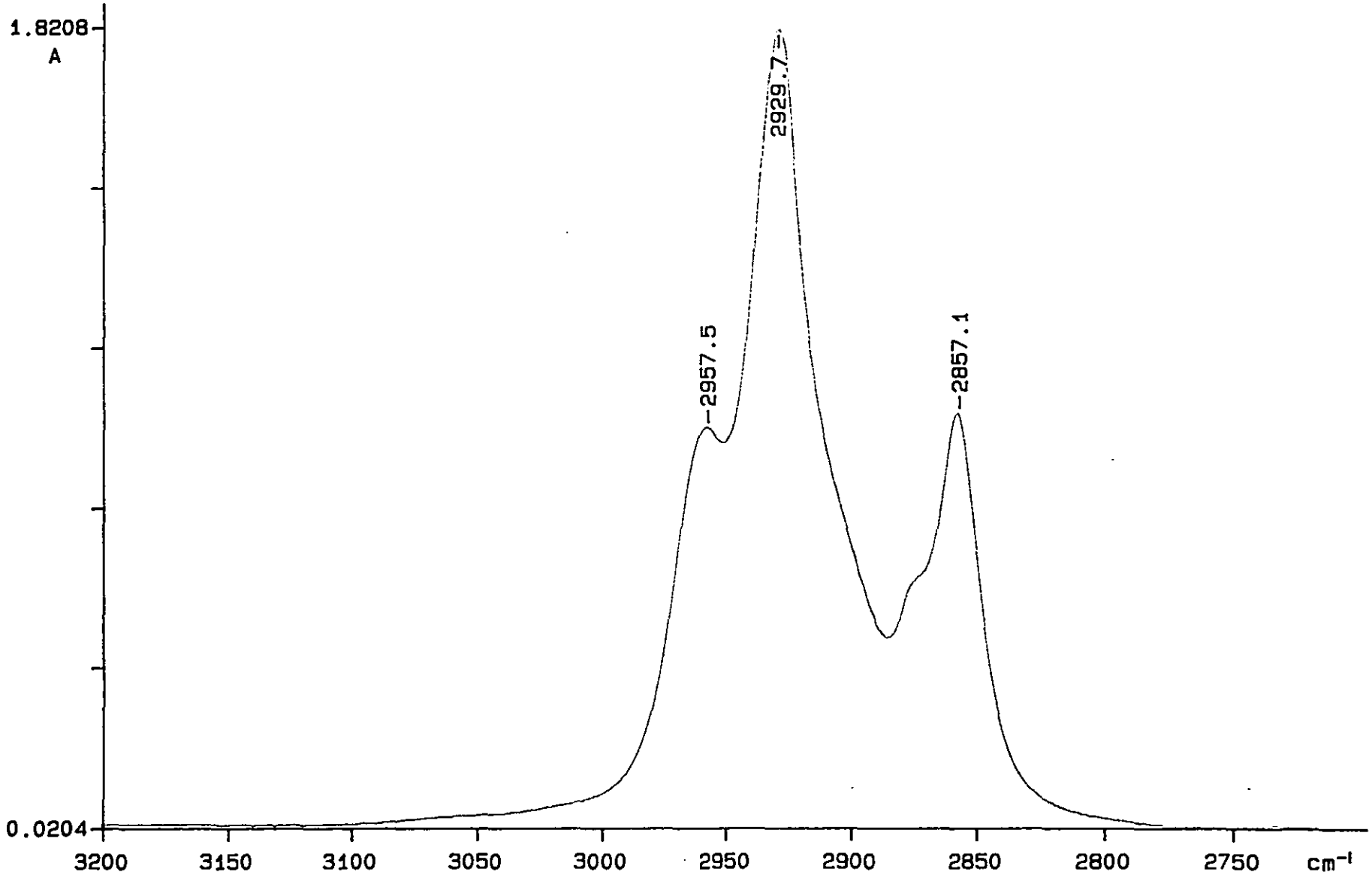
PERKIN ELMER



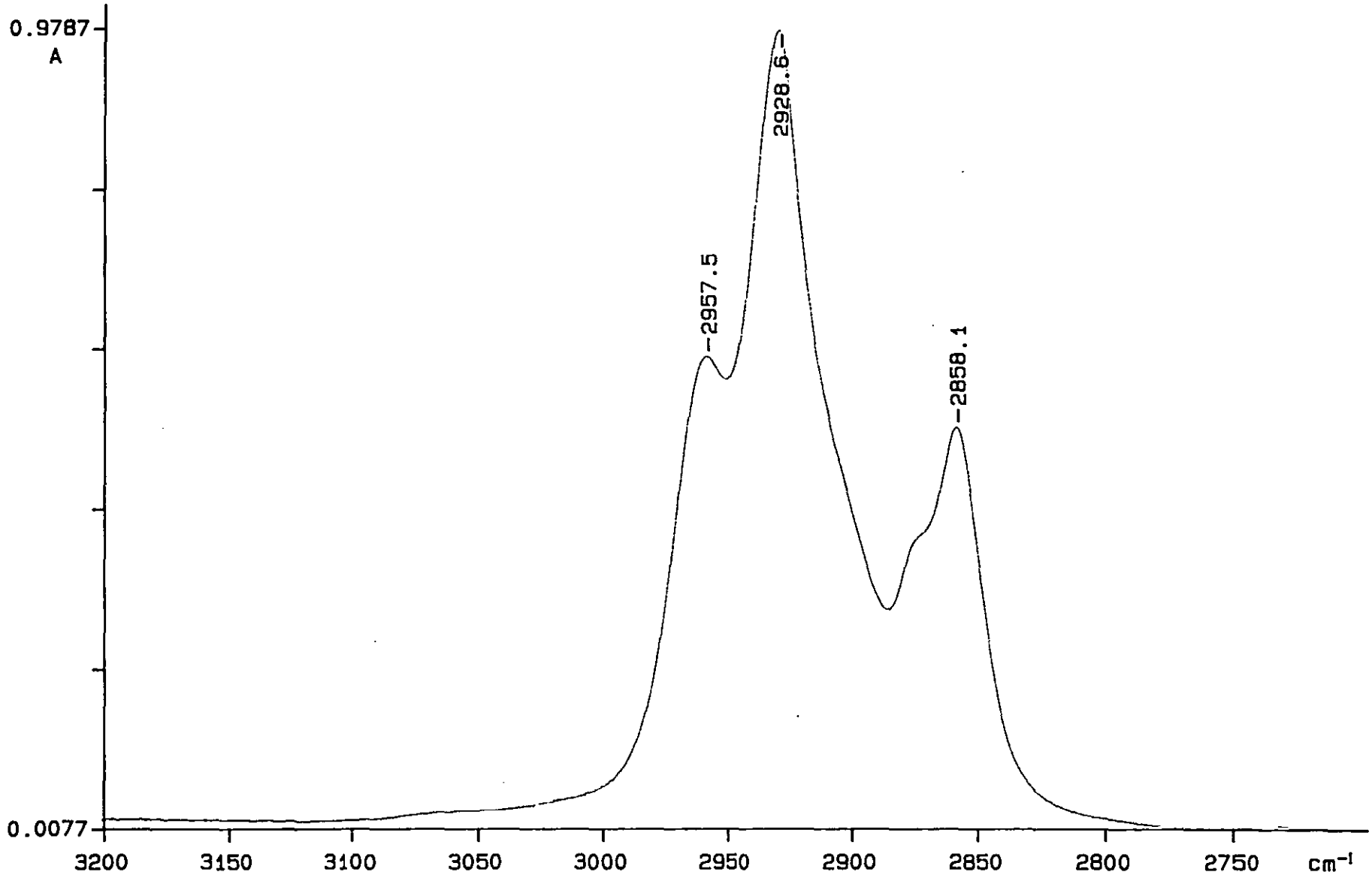
96/08/05 12:32 Loughborough Univ
ymrs0x2: 16 scans, 4.0cm-1, single, diff, flat, smooth



96/08/05 11:29 Loughborough Univ
ymri0: 16 scans, 4.0cm-1, single, diff, flat, smooth



96/08/05 11:09 Loughborough Univ
ymri0x2: 16 scans, 4.0cm-1, single, diff, flat, smooth



96/08/05 13:03 Loughborough Univ
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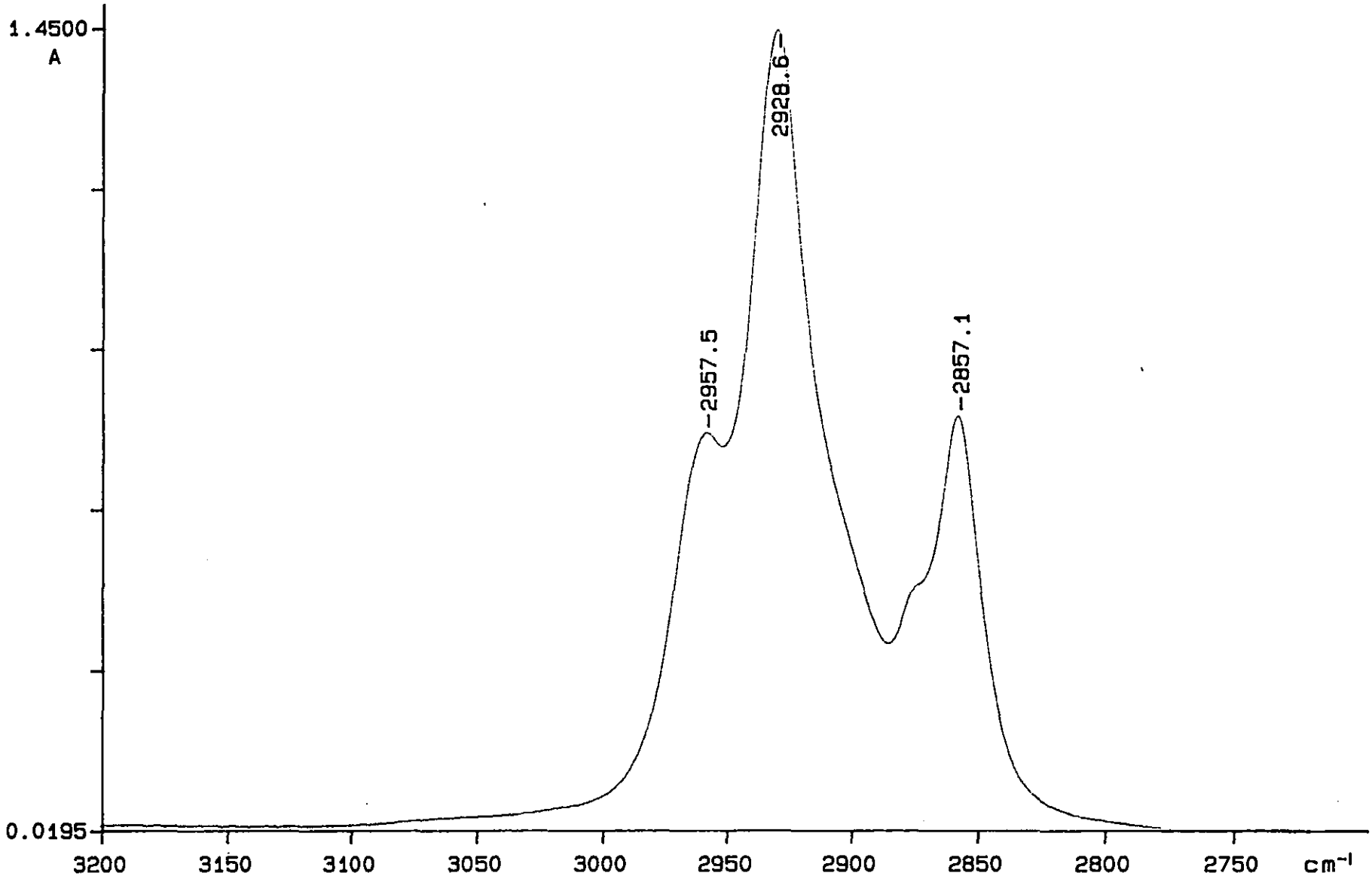
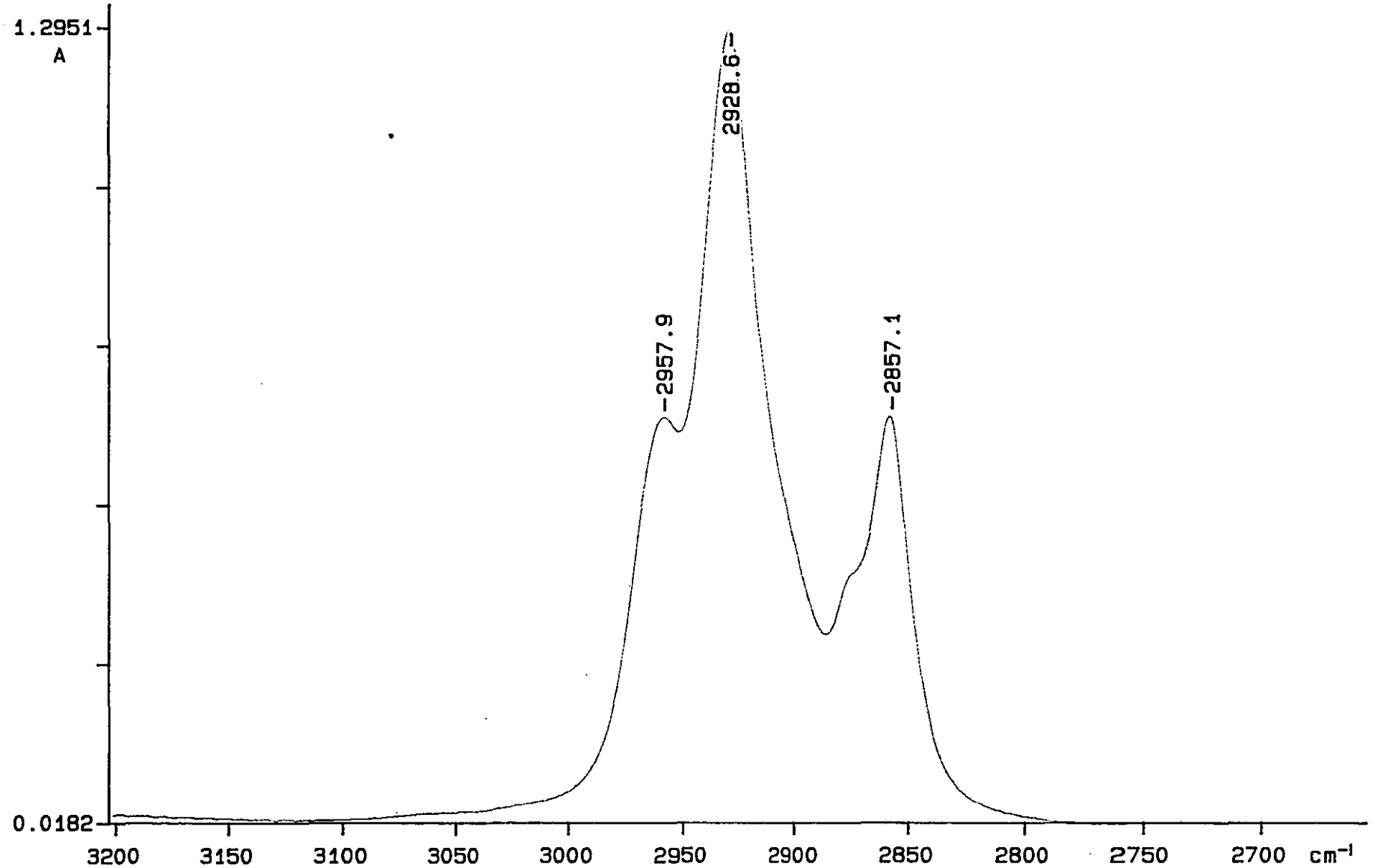
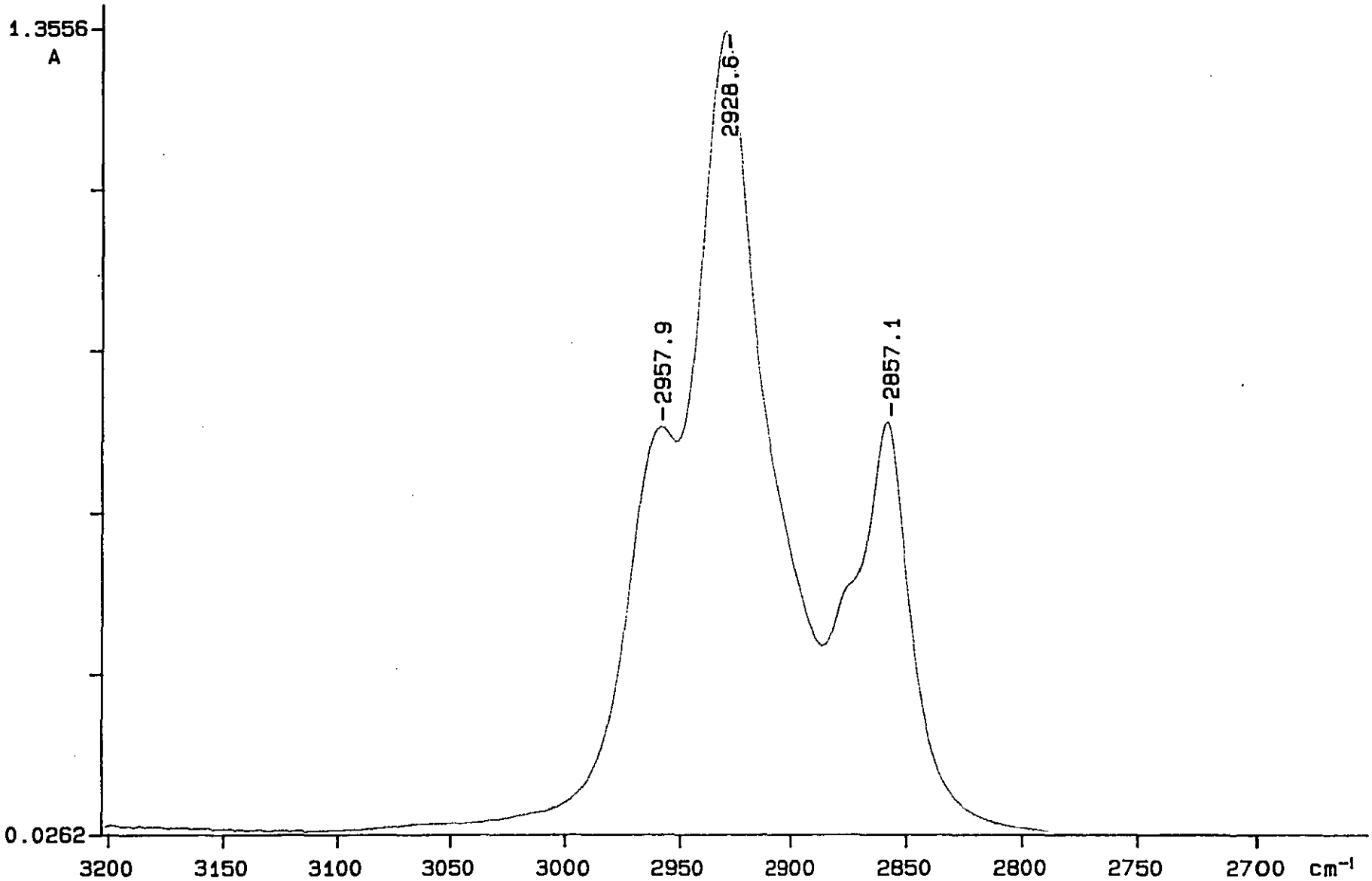


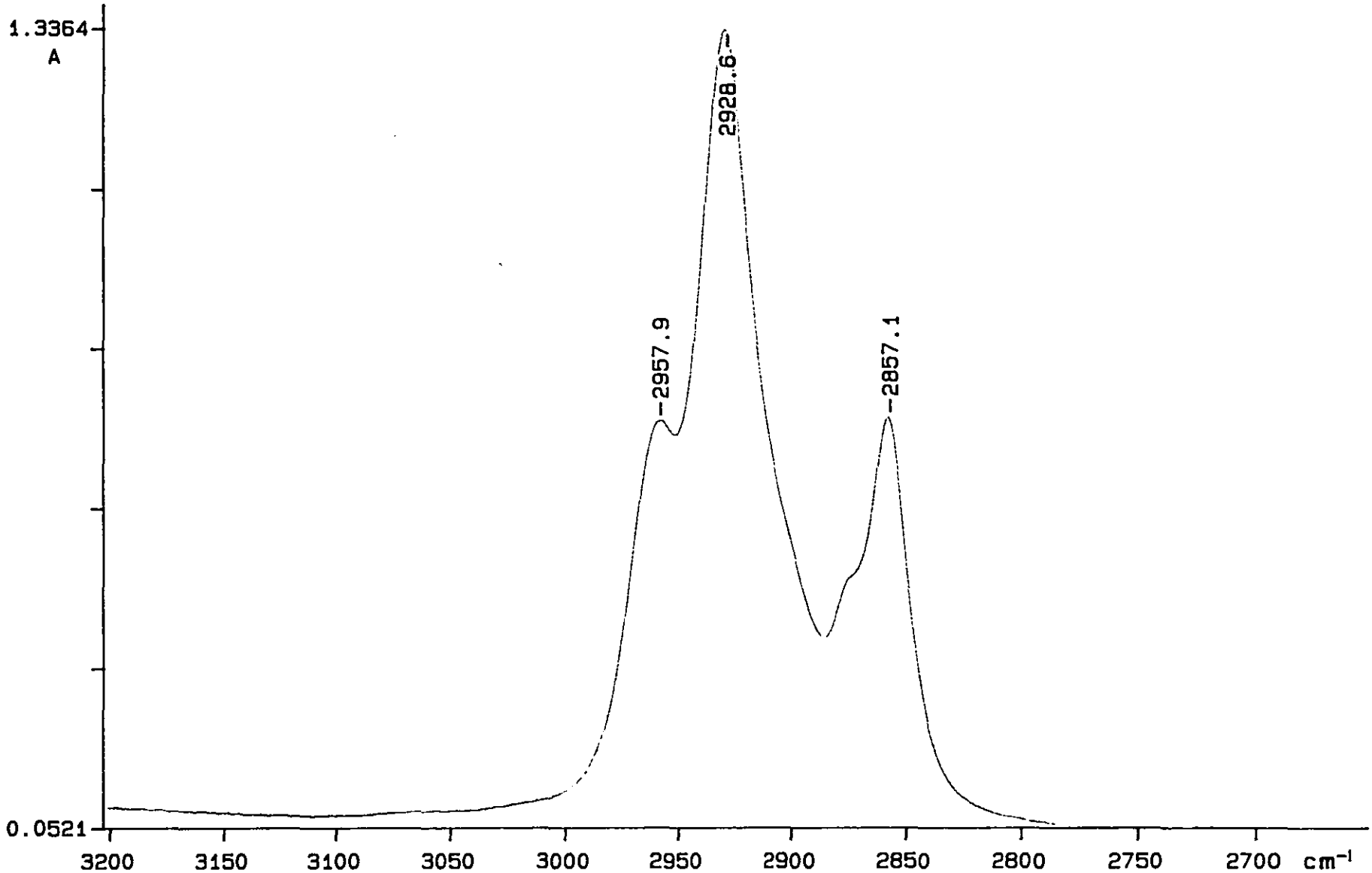
96/08/05 12:56 Loughborough Univ
ymrc0x2: 16 scans, 4.0cm-1, single, diff, flat, smooth



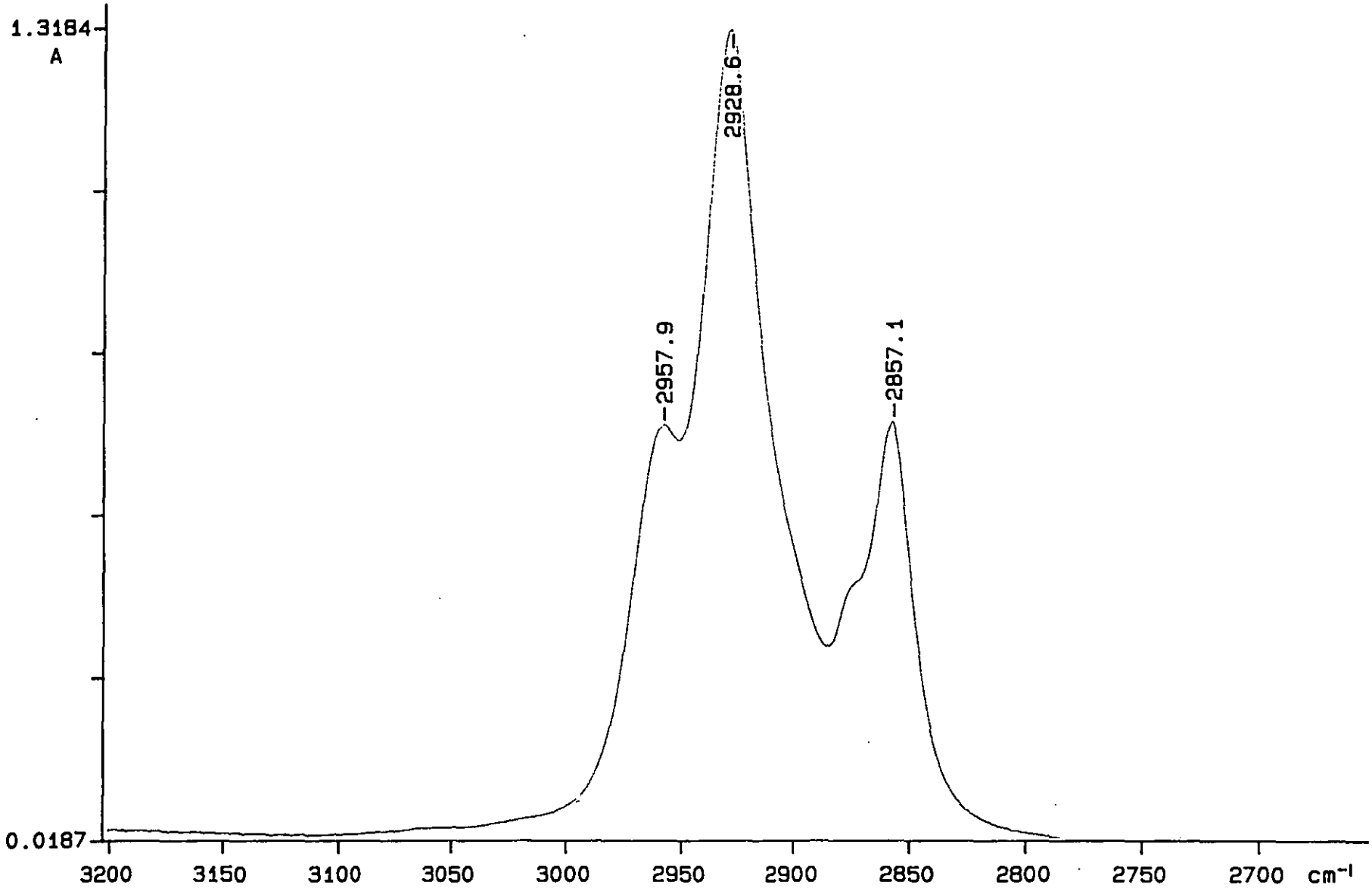
96/08/06 13:10 Loughborough Univ
ymrb2: 16 scans, 4.0cm-1, single, diff, flat, smooth



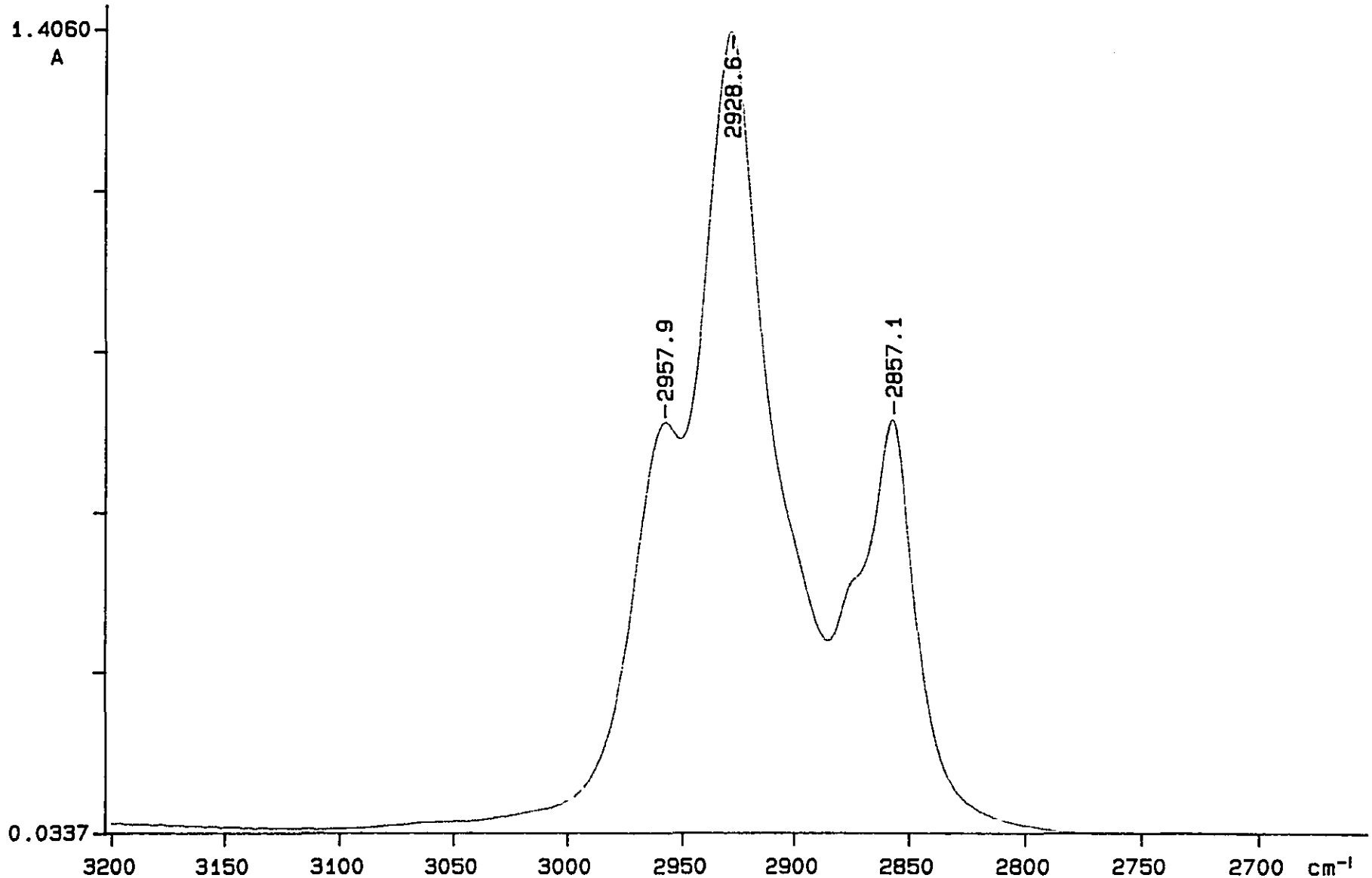
96/08/06 13:23 Loughborough Univ
ymrb2x2: 16 scans, 4.0cm-1, single, diff, flat, smooth



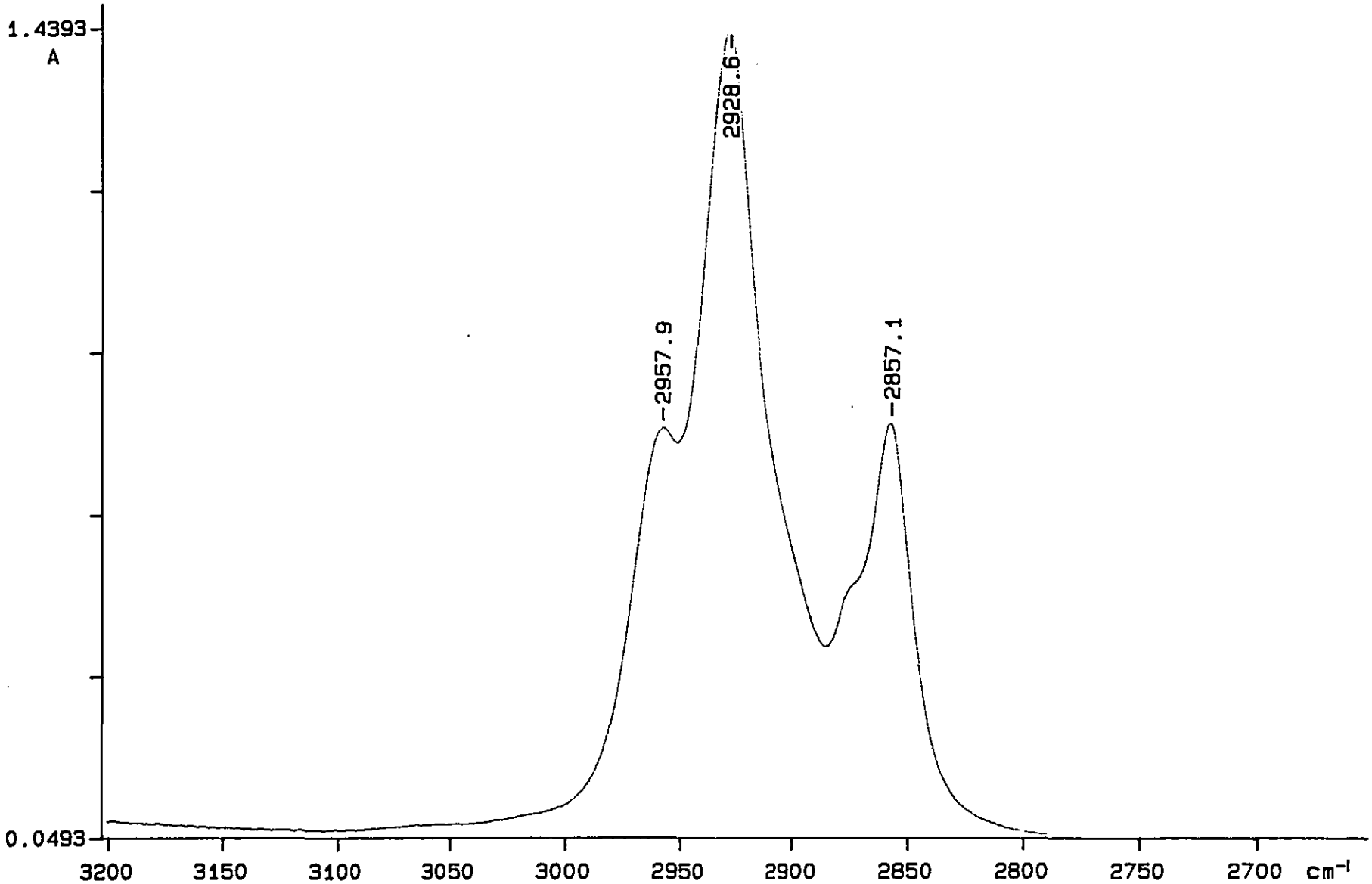
96/08/06 13:33 Loughborough Univ
ymrs2: 16 scans, 4.0cm-1, single, diff, flat, smooth



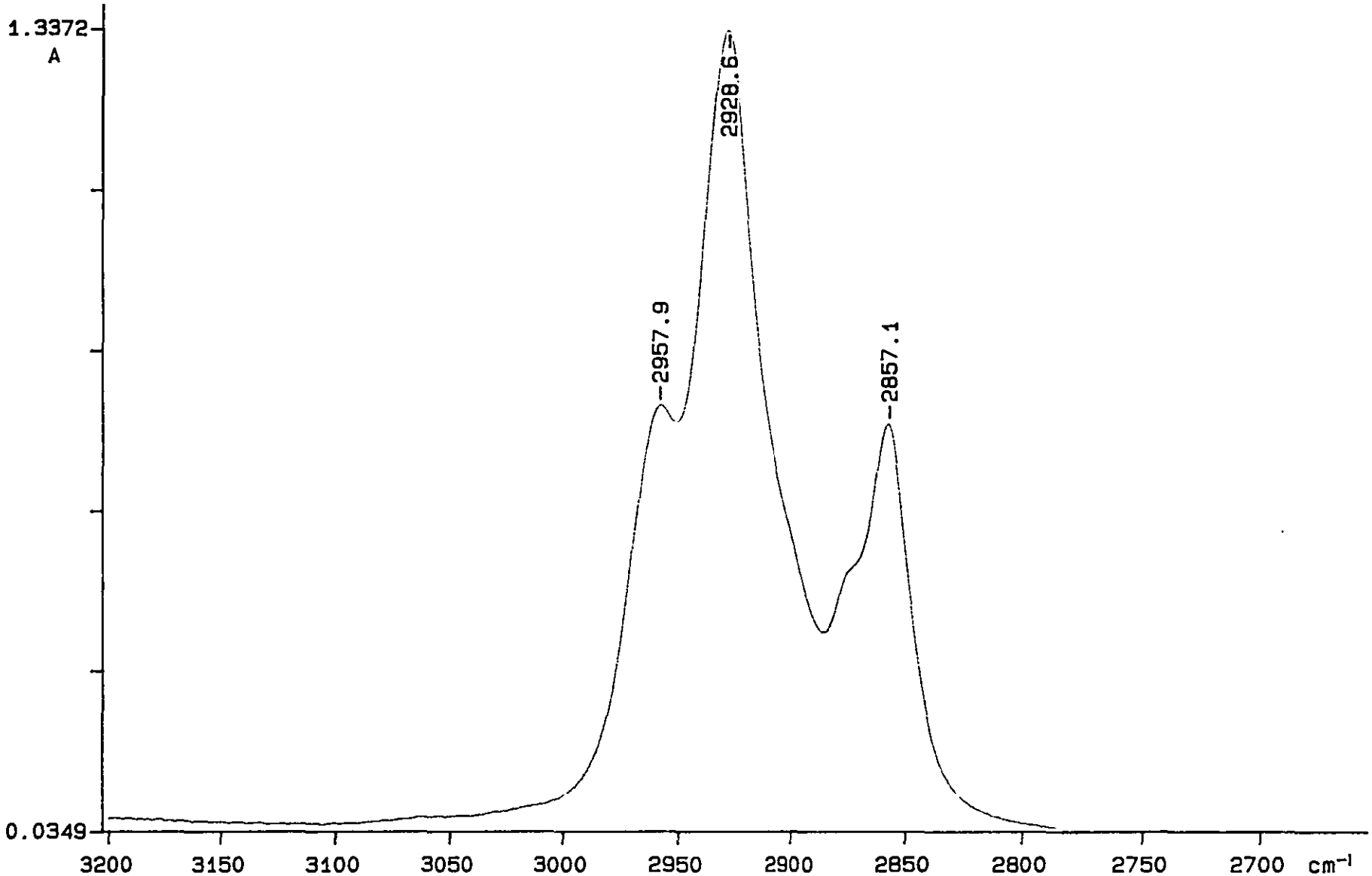
96/08/06 13: 42 Loughborough Univ
ymrs2x2: 16 scans, 4.0cm-1, single, diff, flat, smooth



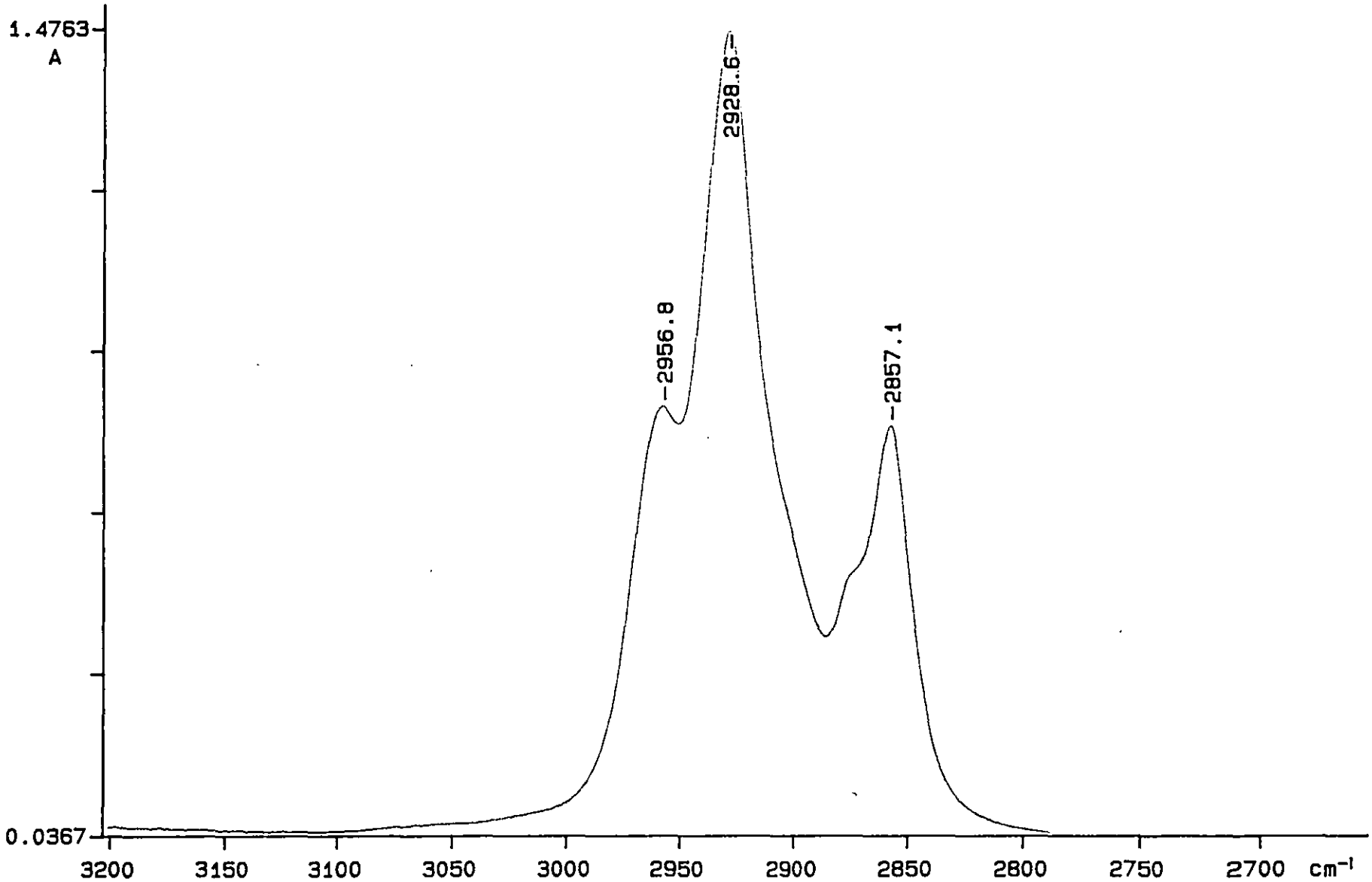
96/08/06 13:48 Loughborough Univ
ymri2: 16 scans, 4.0cm-1, single, diff, flat, smooth



96/08/06 13:58 Loughborough Univ
ymri2x2: 16 scans, 4.0cm-1, single, diff, flat, smooth



96/08/06 14:06 Loughborough Univ
ymrc2: 16 scans, 4.0cm-1, single, diff, flat, smooth



96/08/06 14:15 Loughborough Univ
ymrc2x2: 16 scans, 4.0cm-1, single, diff, flat, smooth

DAY 5

sample 1B	
peak, (cm-1)	absorption
2957.5	0.5837
2928.6	1.0621
2856.9	0.5474
total abs	2.1932

sample 2B	
peak, (cm-1)	absorption
2956.8	0.629
2928.6	1.1667
2856.9	0.604
total abs	2.3997

sample 3S	
peak, (cm-1)	absorption
2956.8	0.6003
2928.6	1.067
2856.9	0.5541
total abs	2.214

sample 4S	
peak, (cm-1)	absorption
2956.8	0.5471
2928.6	0.937
2856.9	0.4749
total abs	1.959

sample 5I	
peak, (cm-1)	absorption
2956.8	0.6951
2928.6	1.2102
2856.9	0.6329
total abs	2.5382

sample 6L	
peak, (cm-1)	absorption
2956.8	0.7454
2928.6	1.3942
2856.9	0.7492
total abs	2.8888

sample 7C	
peak, (cm-1)	absorption
2956.8	0.697
2929.6	1.2738
2856.9	0.6574
total abs	2.6282

sample 8C	
peak, (cm-1)	absorption
2956.8	0.7691
2929.6	1.4874
2856.9	0.7723
total abs	3.0288

Conversion of absorbance to oil content based on calibration standard curve 2

sample	total abs	avg	extrapolate O&G (g)		Corr Fact	O&G (g)
1B	2.1932					
2B	2.3997	2.29645	0.105		1.06	0.1113
3S	2.214					
4S	1.959	2.0865	0.1		1.02	0.102
5I	2.5382					
6I	2.8888	2.7135	0.125		0.98	0.1225
7C	2.6282					
8C	3.0288	2.8285	0.13			0.13

DAY 8

sample 1B	
peak, (cm-1)	absorption
2957.5	0.8107
2928.6	1.3343
2857.1	0.7033
total abs	2.8483

sample 2B	
peak, (cm-1)	absorption
2957.5	0.7486
2928.6	1.1849
2857.1	0.6201
total abs	2.5536

sample 3S	
peak, (cm-1)	absorption
2957.5	0.6261
2928.6	1.0401
2857.1	0.5409
total abs	2.2071

sample 4S	
peak, (cm-1)	absorption
2957.5	0.6726
2928.6	1.1186
2858.1	0.5699
total abs	2.3611

sample 5I	
peak, (cm-1)	absorption
2957.5	0.7196
2928.6	1.1959
2858.1	0.6069
total abs	2.5224

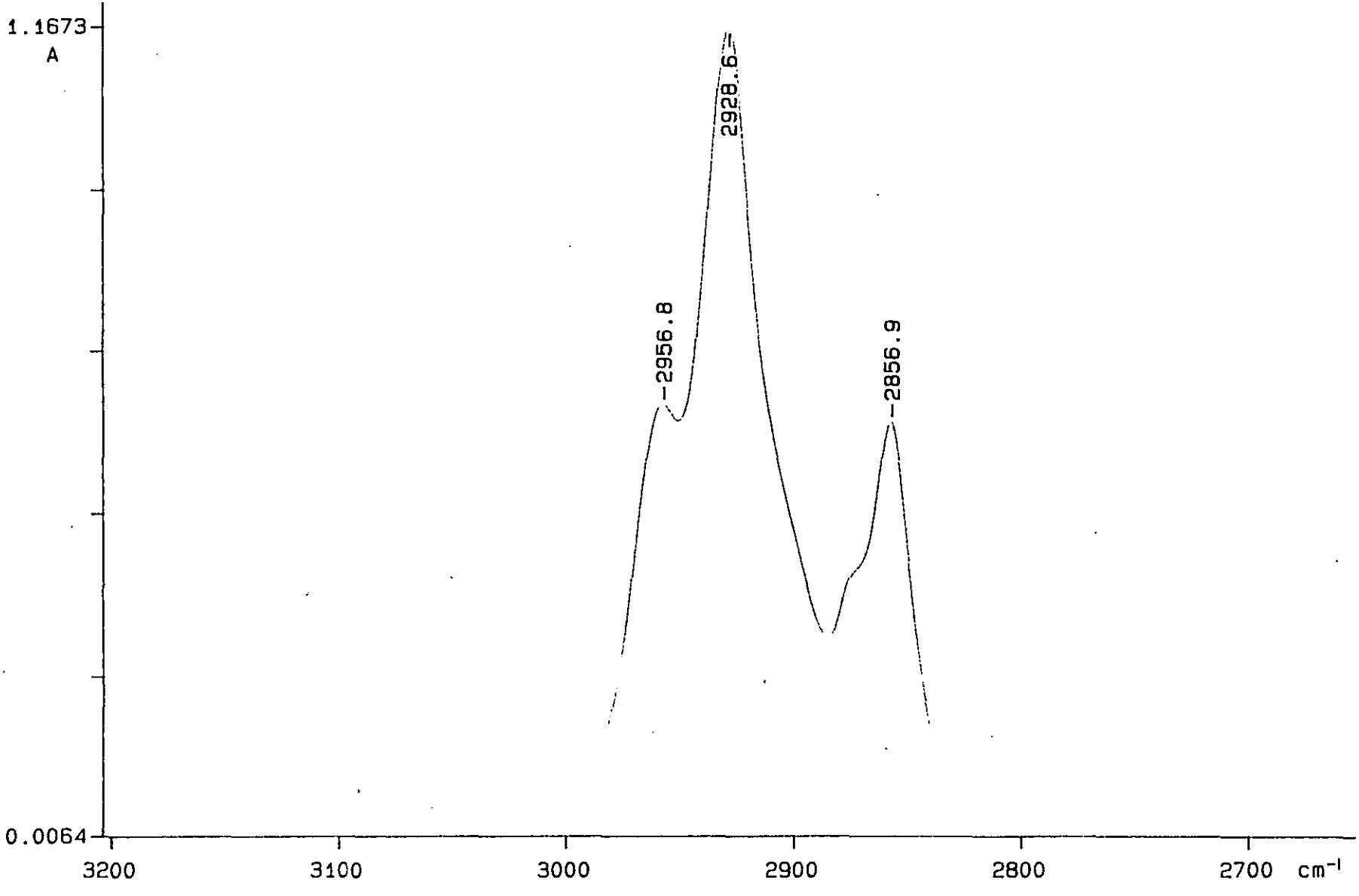
sample 6L	
peak, (cm-1)	absorption
2957.5	0.5762
2928.6	0.9356
2858.1	0.4788
total abs	1.9906

sample 7C	
peak, (cm-1)	absorption
2957.5	0.8187
2928.6	1.6125
2857.1	0.837
total abs	3.2682

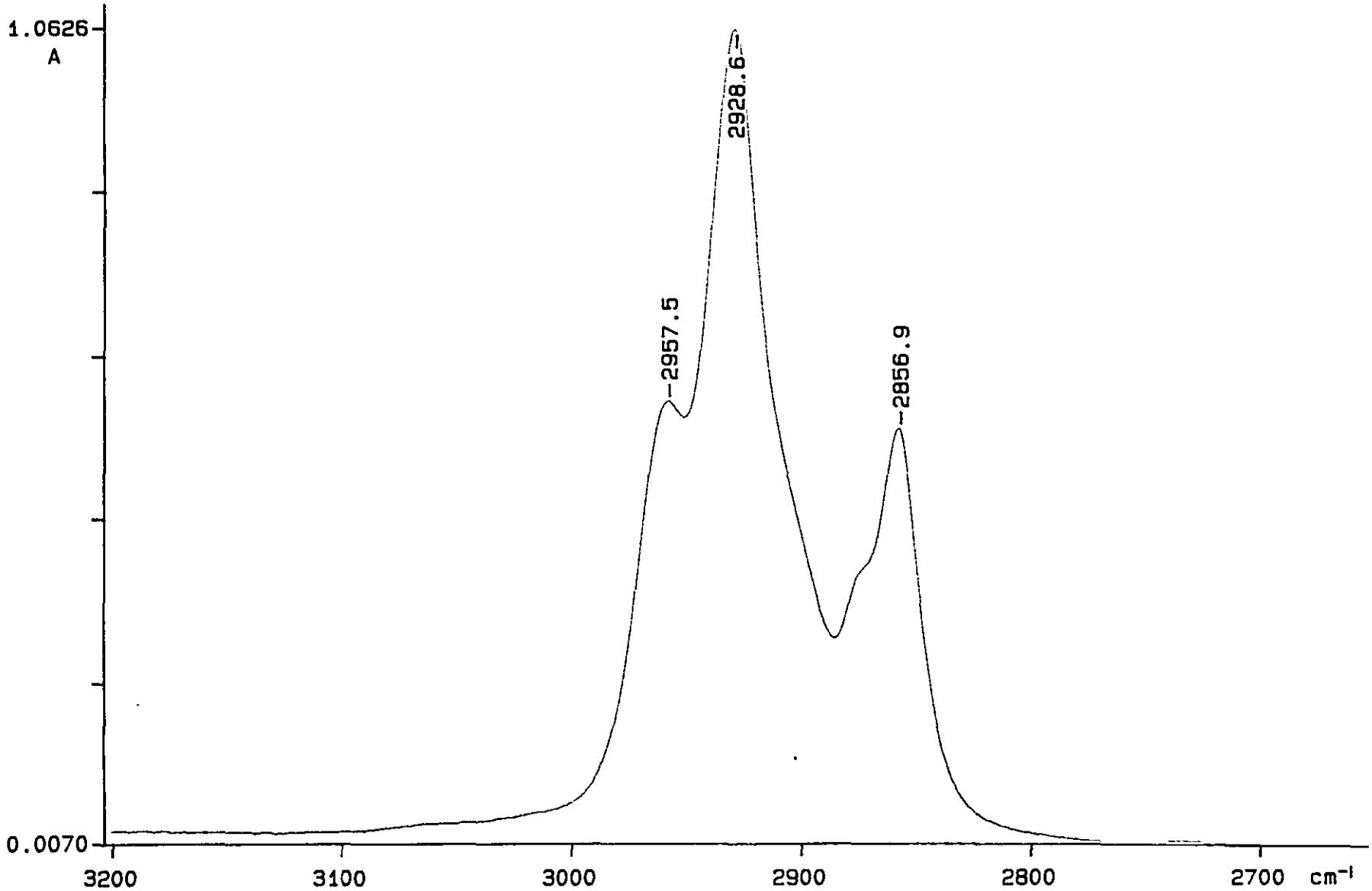
sample 8C	
peak, (cm-1)	absorption
2957.5	0.7189
2929.6	1.1738
2858.1	0.5906
total abs	2.4833

Conversion of absorbance to oil content based on calibration standard curve 2

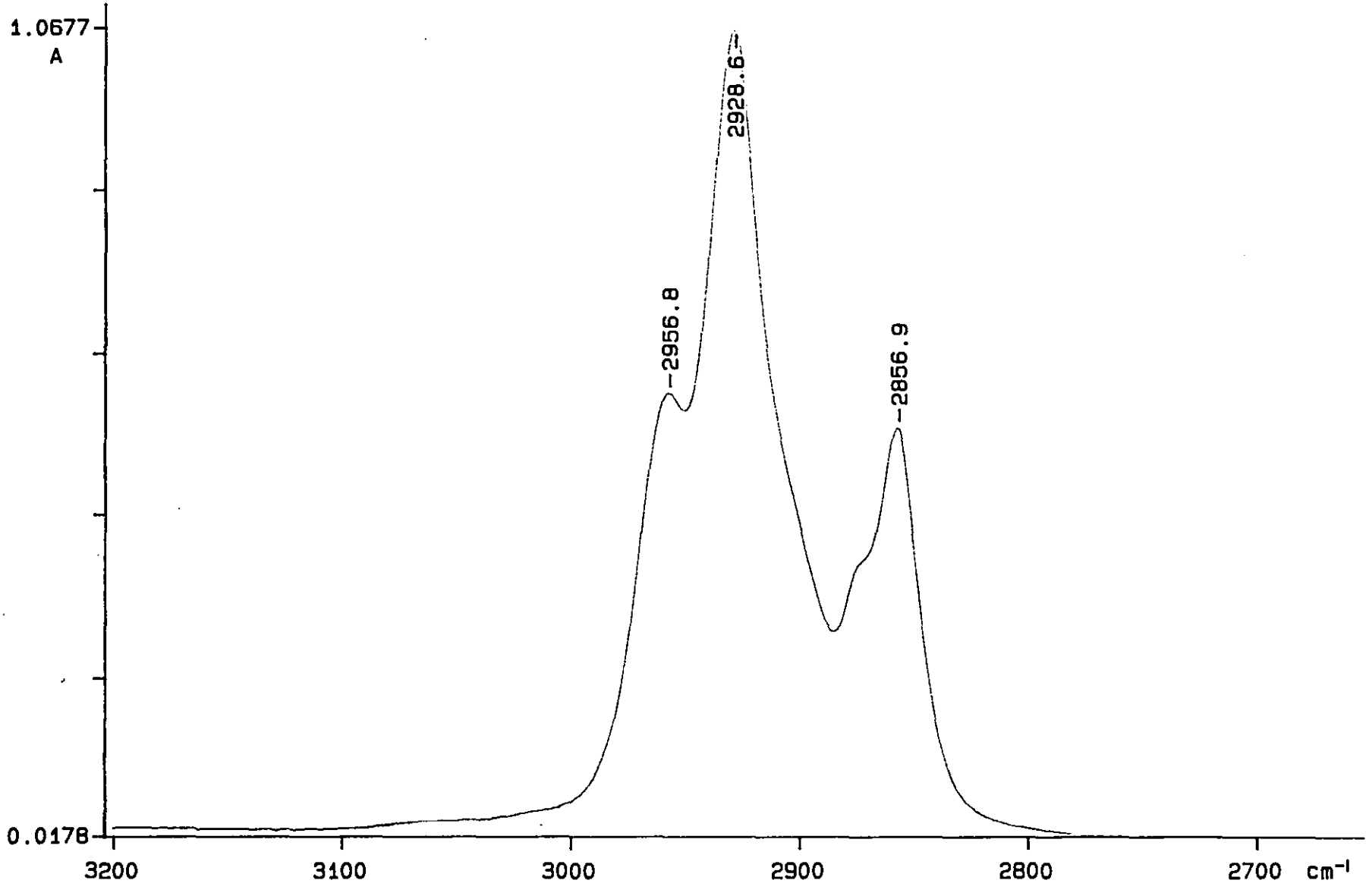
sample	total abs	Avg	extrapolate O&G (g)		Corr Fact	O&G (g)
1B	2.8483					
2B	2.5536	2.70095	0.125		1.06	0.1325
3S	2.2071					
4S	2.3611	2.2841	0.105		1.02	0.1071
5I	2.5224					
6I	1.9906	2.2565	0.103		0.98	0.1009
7C	3.2682					
8C	2.4833	2.87575	0.135			0.135



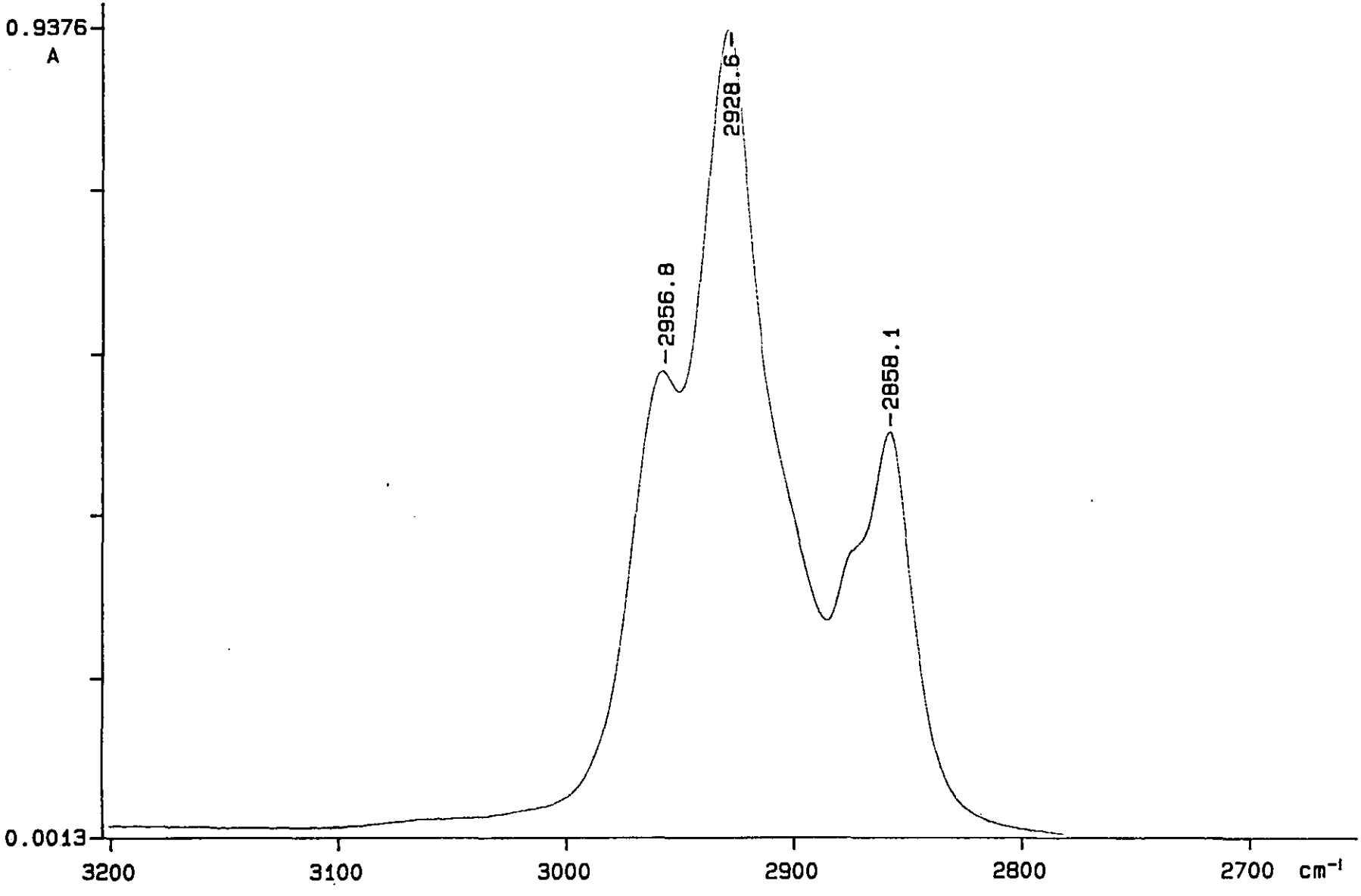
96/08/07 10: 13 S.H. Osman
ymrb5x2: 16 scans, 4.0cm-1, single, diff, flat, smooth



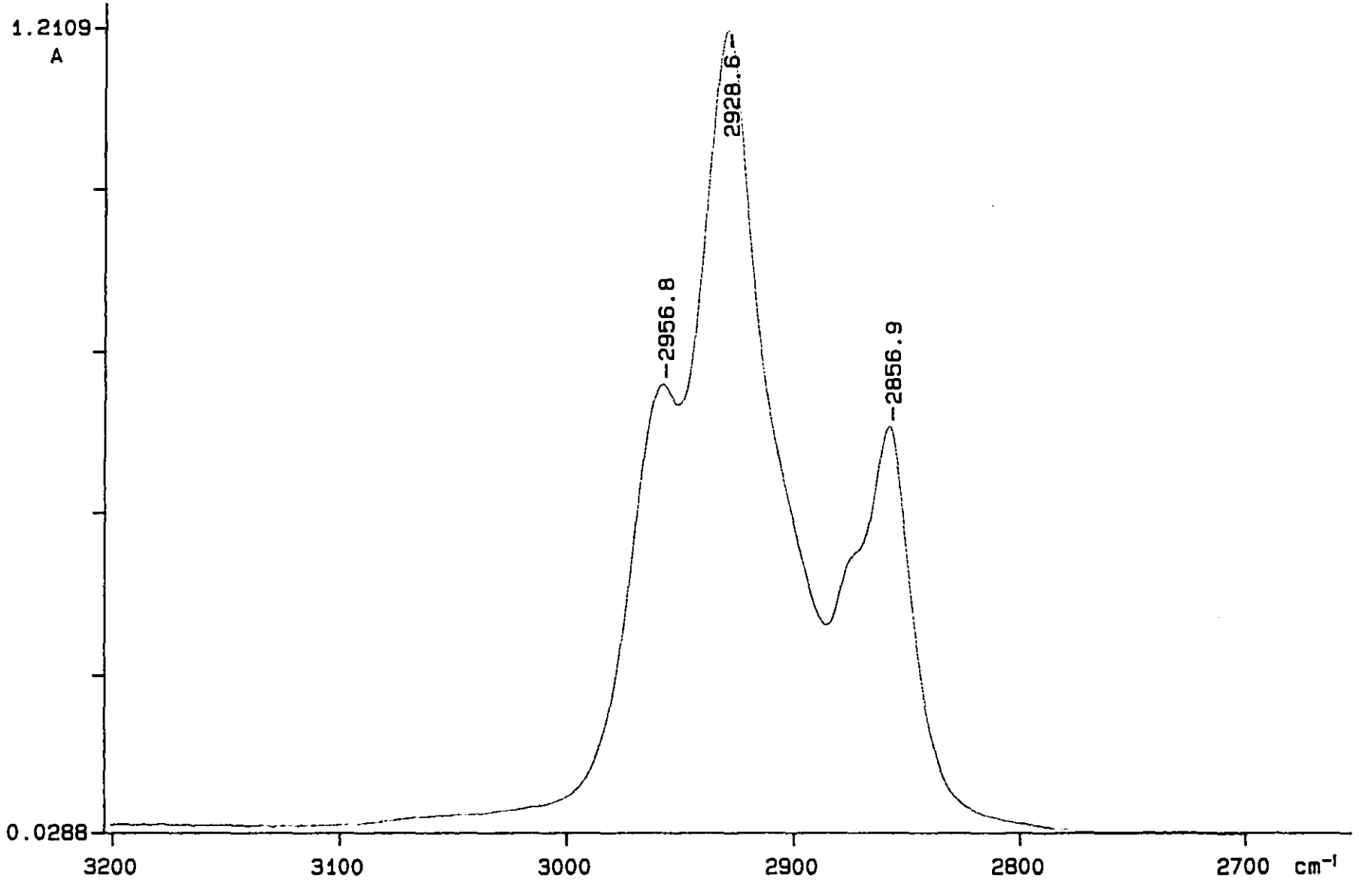
96/08/07 10:04 S.H. Osman
ymrb5: 16 scans, 4.0cm-1, single, diff, flat, smooth



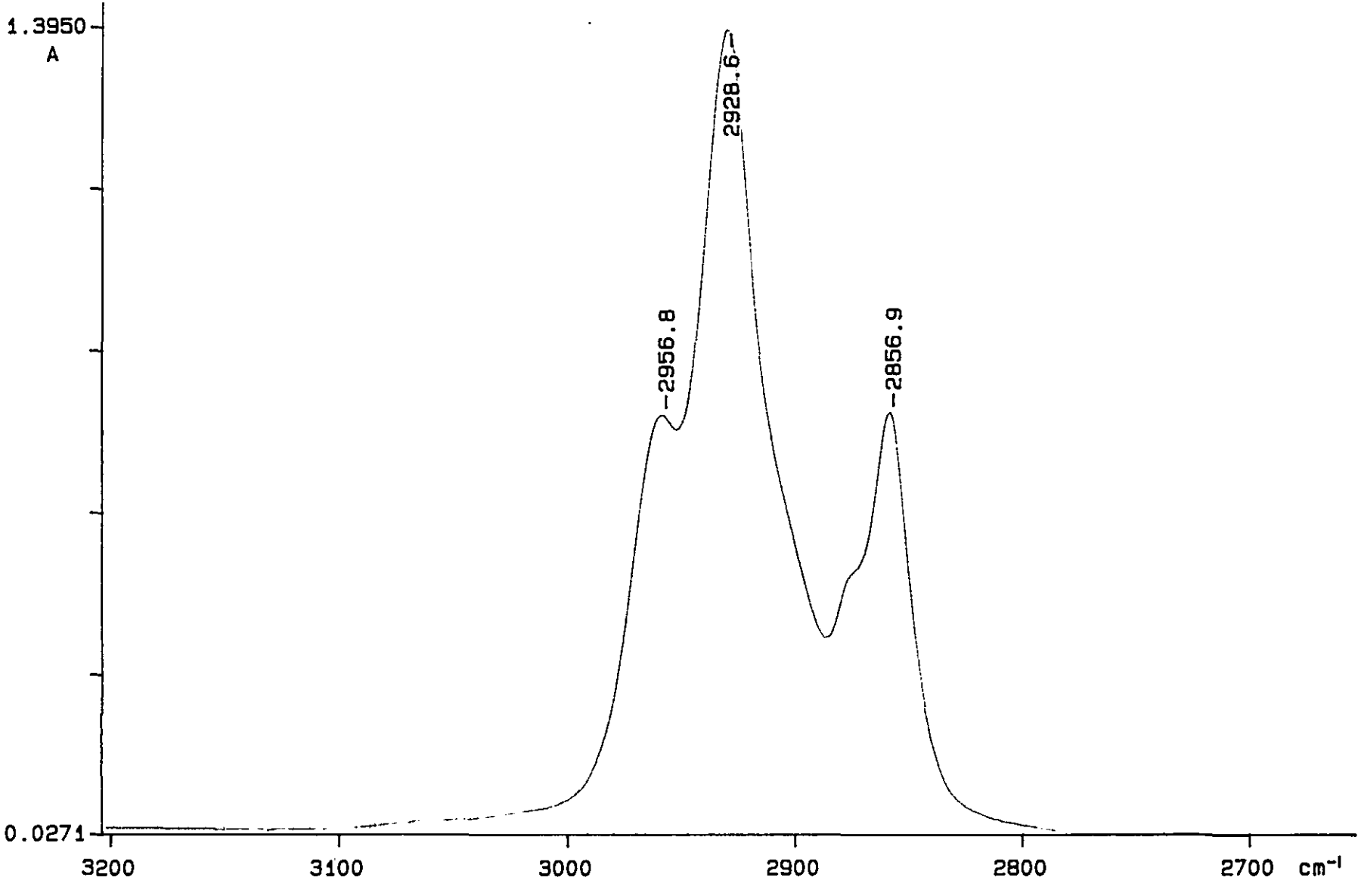
96/08/07 10:22 S.H. Osman
ymrs5: 16 scans, 4.0cm-1, single, diff, flat, smooth



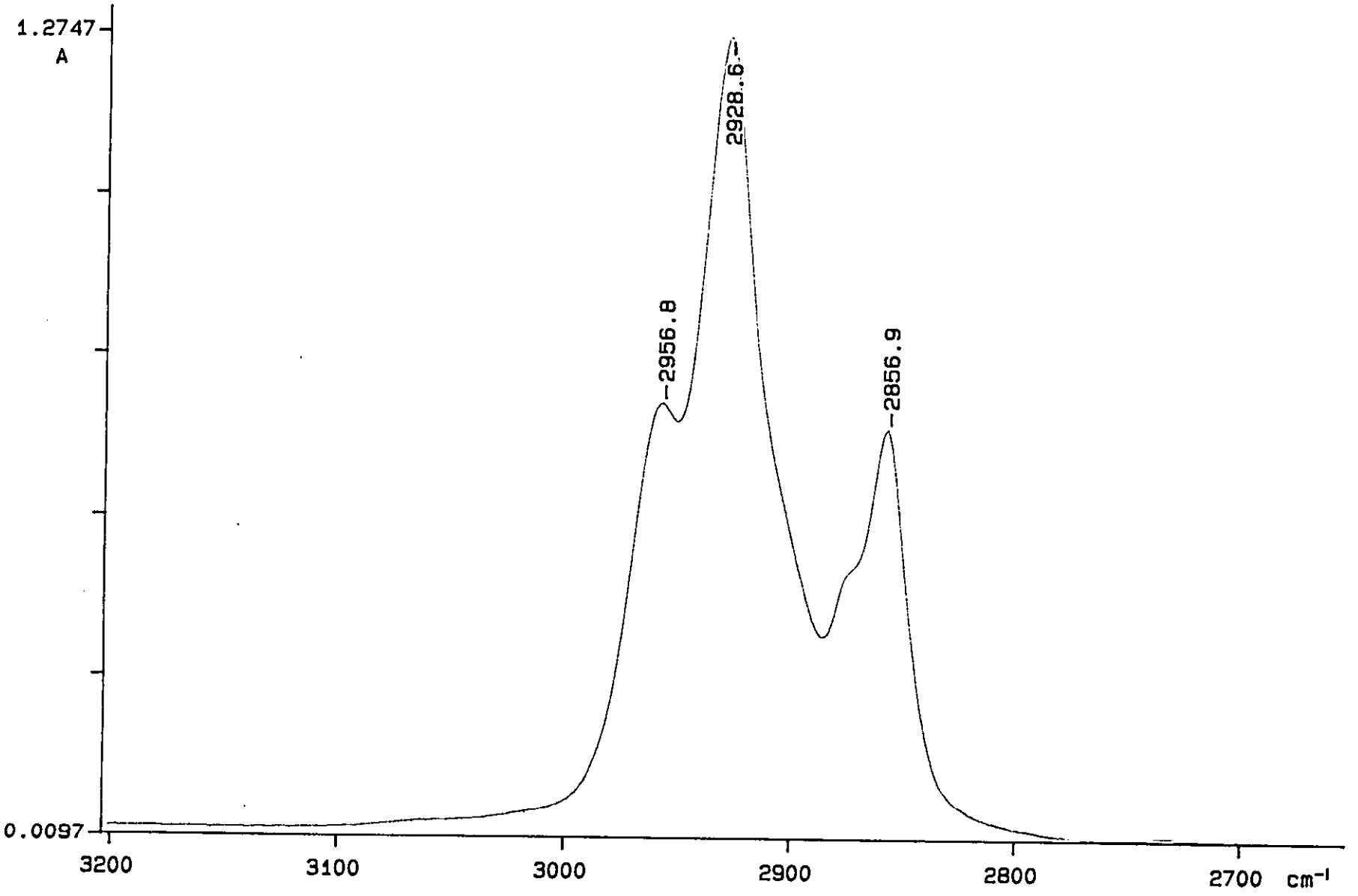
96/08/07 10:29 S.H. Osman
ymrs5x2: 16 scans, 4.0cm-1, single, diff, flat, smooth



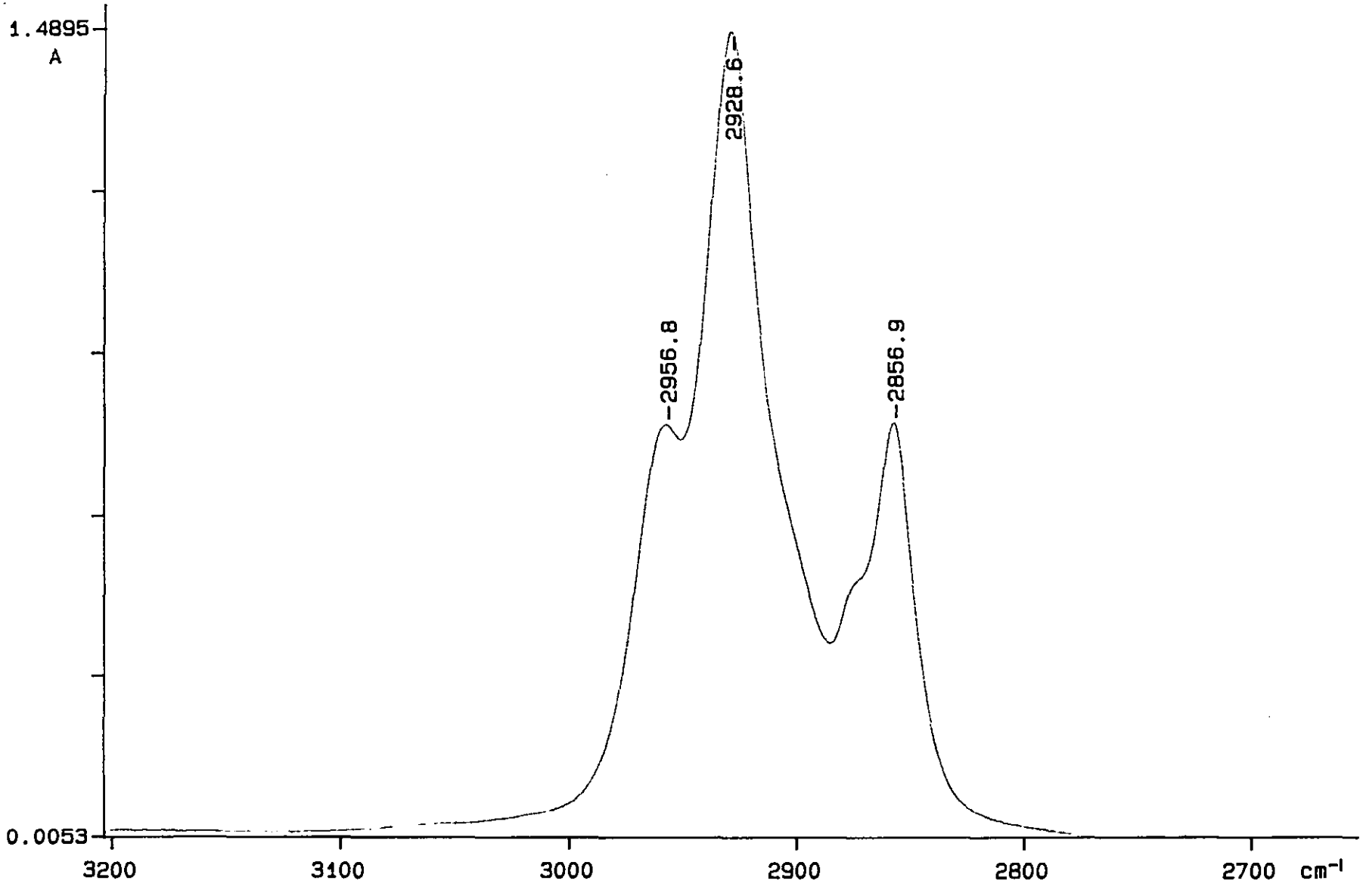
96/08/07 10:36 S.H. Osman
ymri5: 16 scans, 4.0cm-1, single, diff, flat, smooth



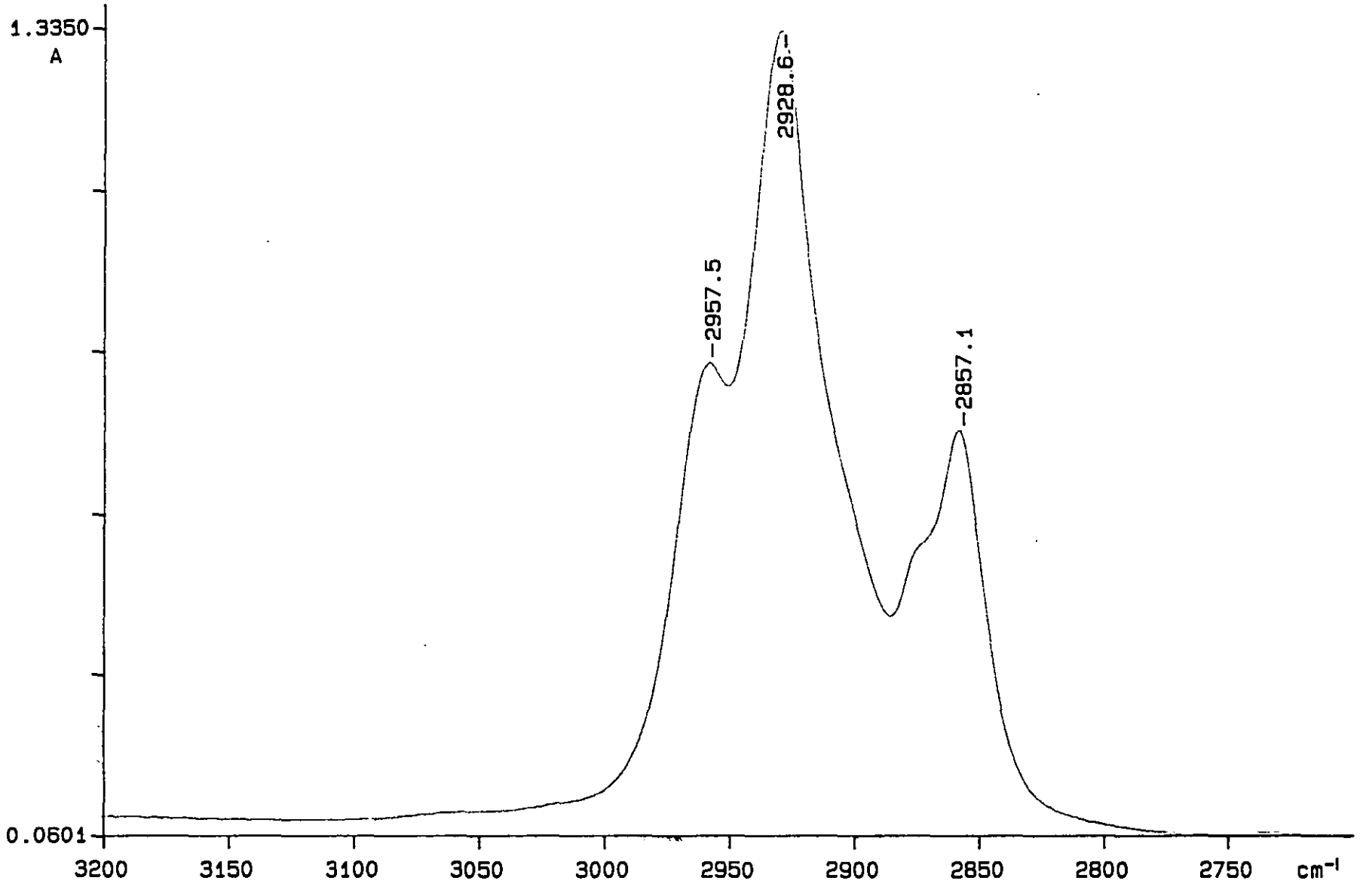
96/08/07 10:45 S.H. Osman
ymri5x2: 16 scans, 4.0cm-1, single, diff, flat, smooth



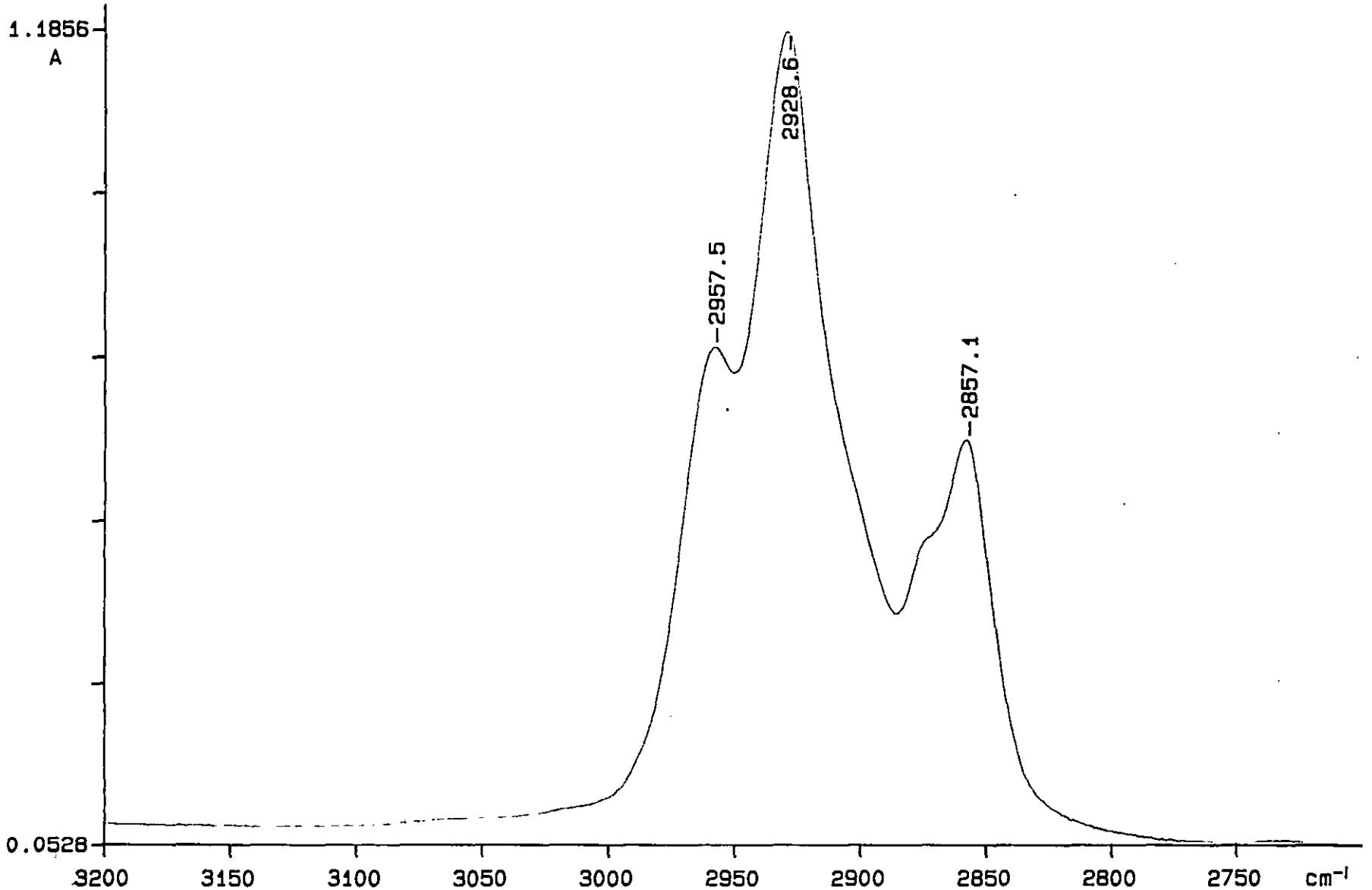
96/08/07 10:51 S.H. Osman
ymrc5: 16 scans, 4.0cm-1, single, diff, flat, smooth



96/08/07 10:58 S.H. Osman
ymrc5x2: 16 scans, 4.0cm-1, single, diff, flat, smooth

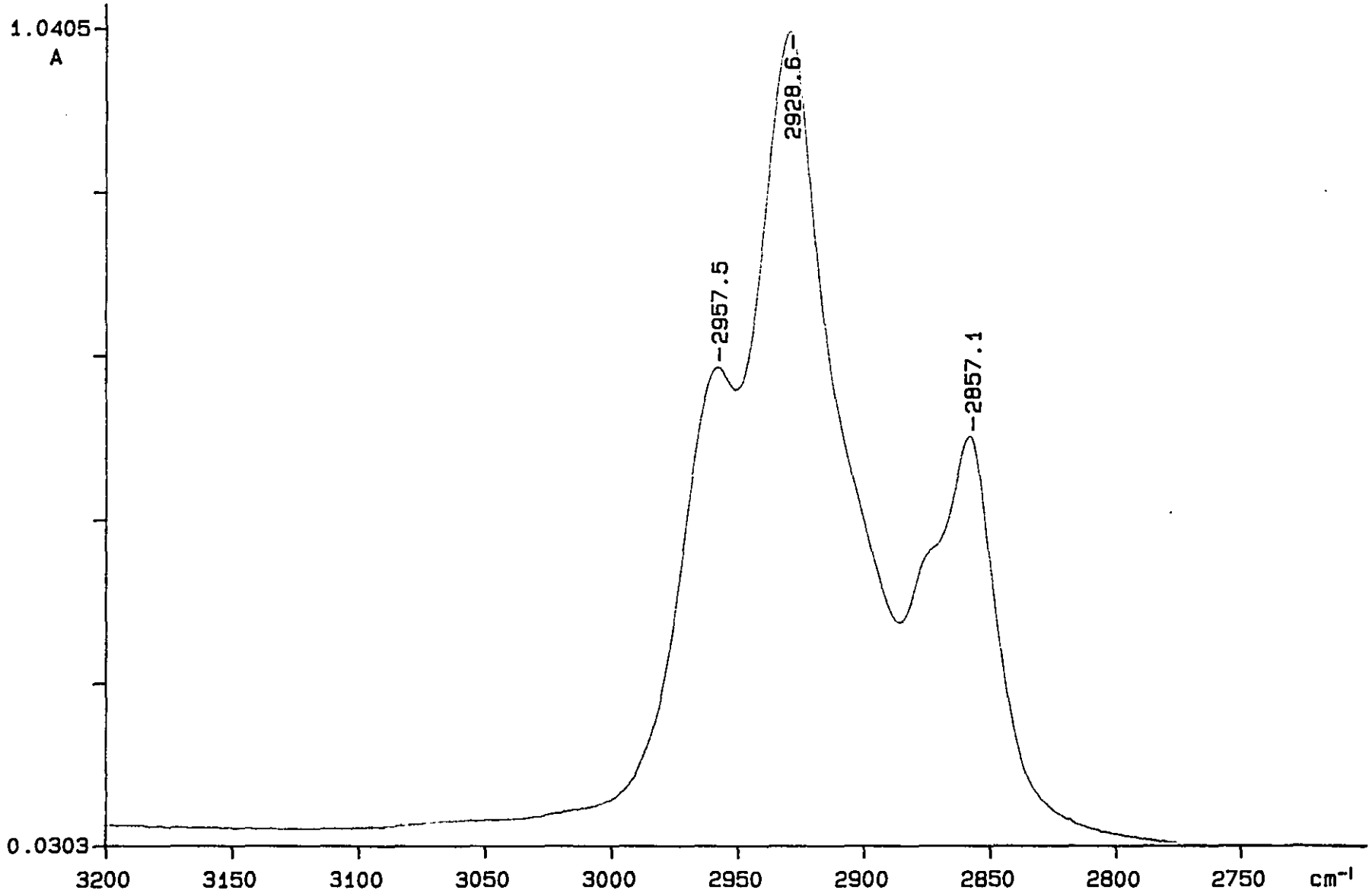


96/08/04 11:16 Loughborough Univ
Ymrb8: 16 scans, 4.0cm-1, single, diff, flat, smooth

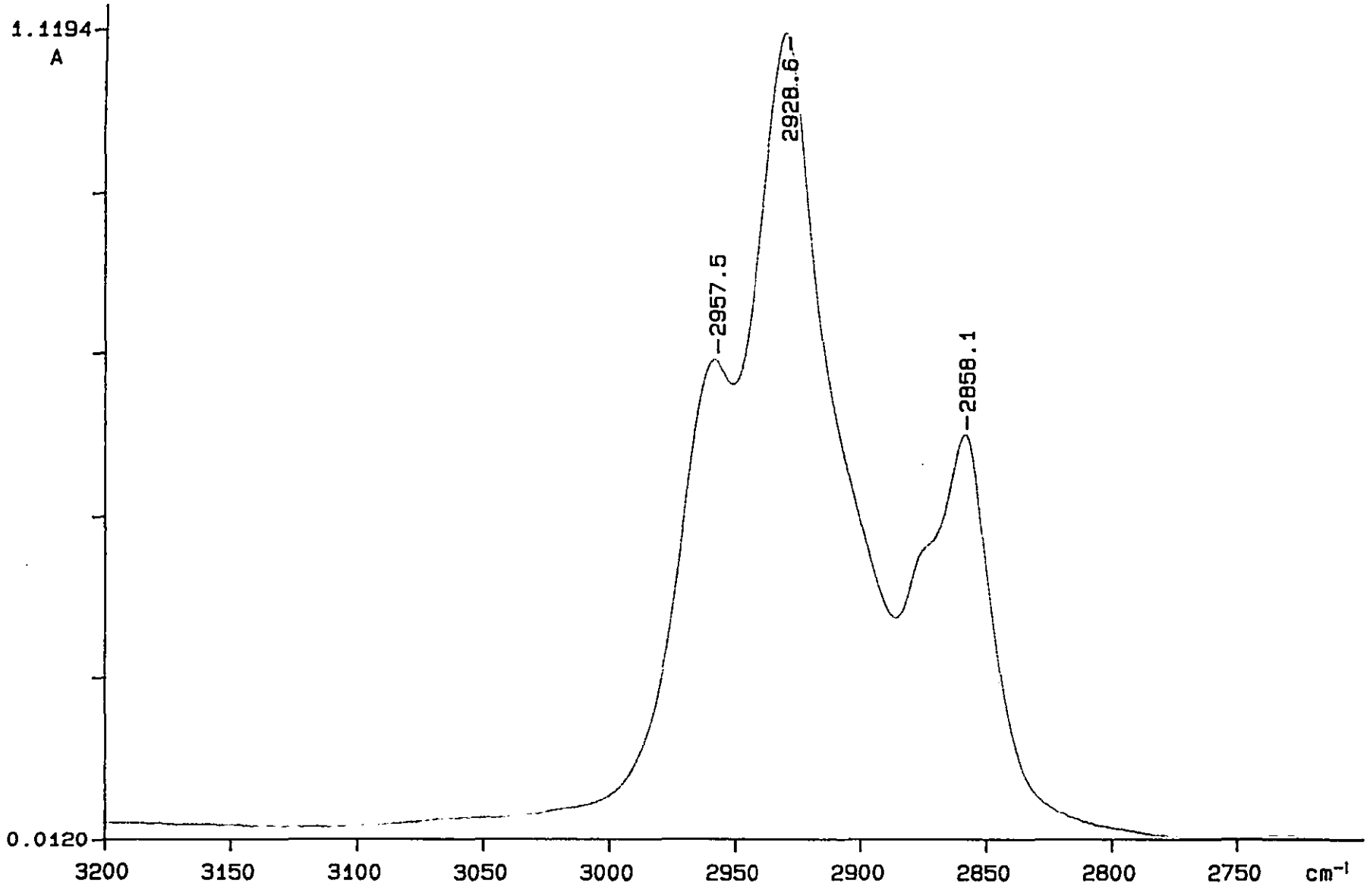


96/08/04 11:38 Loughborough Univ
ymrb8x2: 16 scans, 4.0cm-1, single, diff, flat, smooth

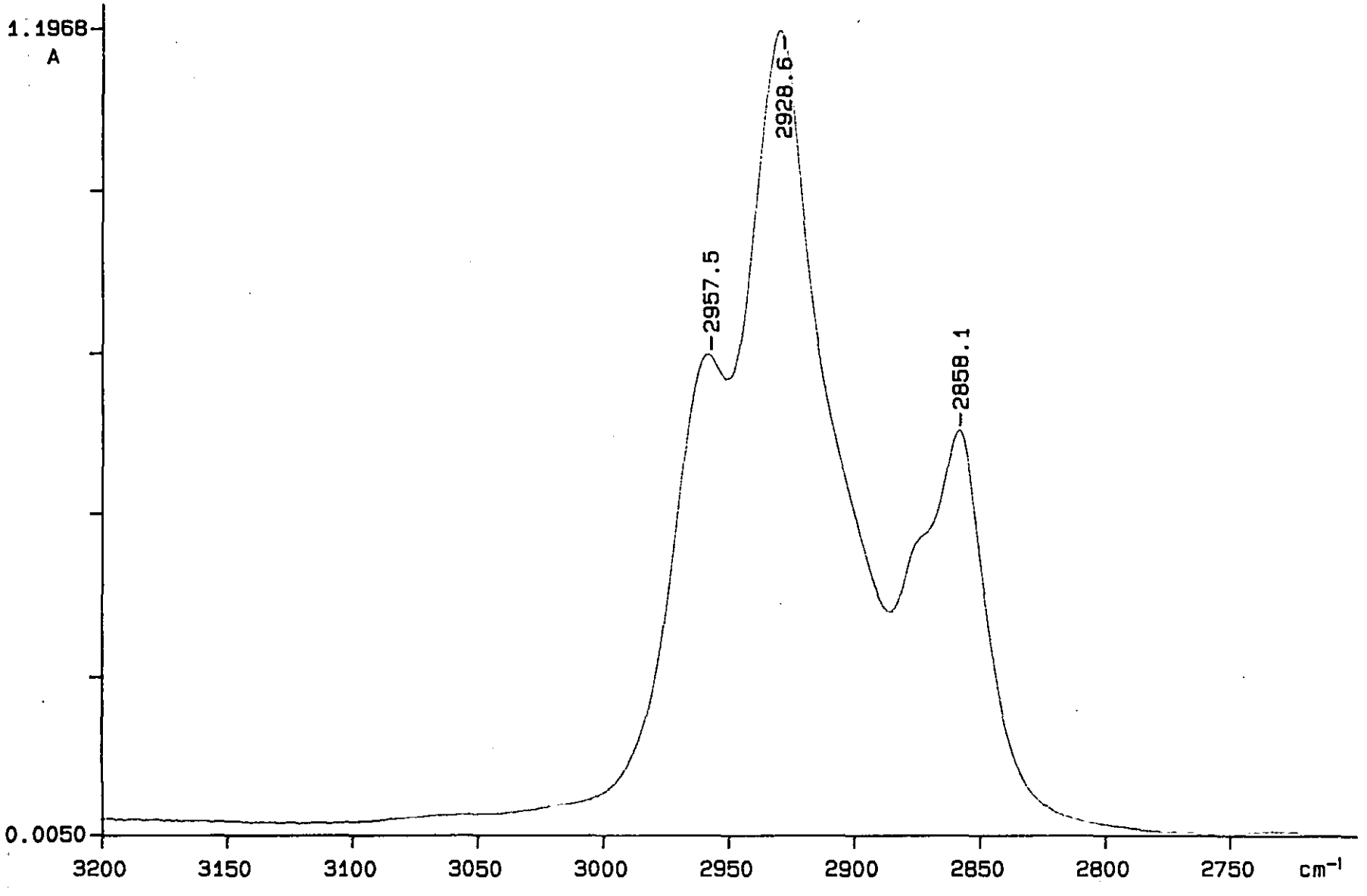
PERKIN ELMER



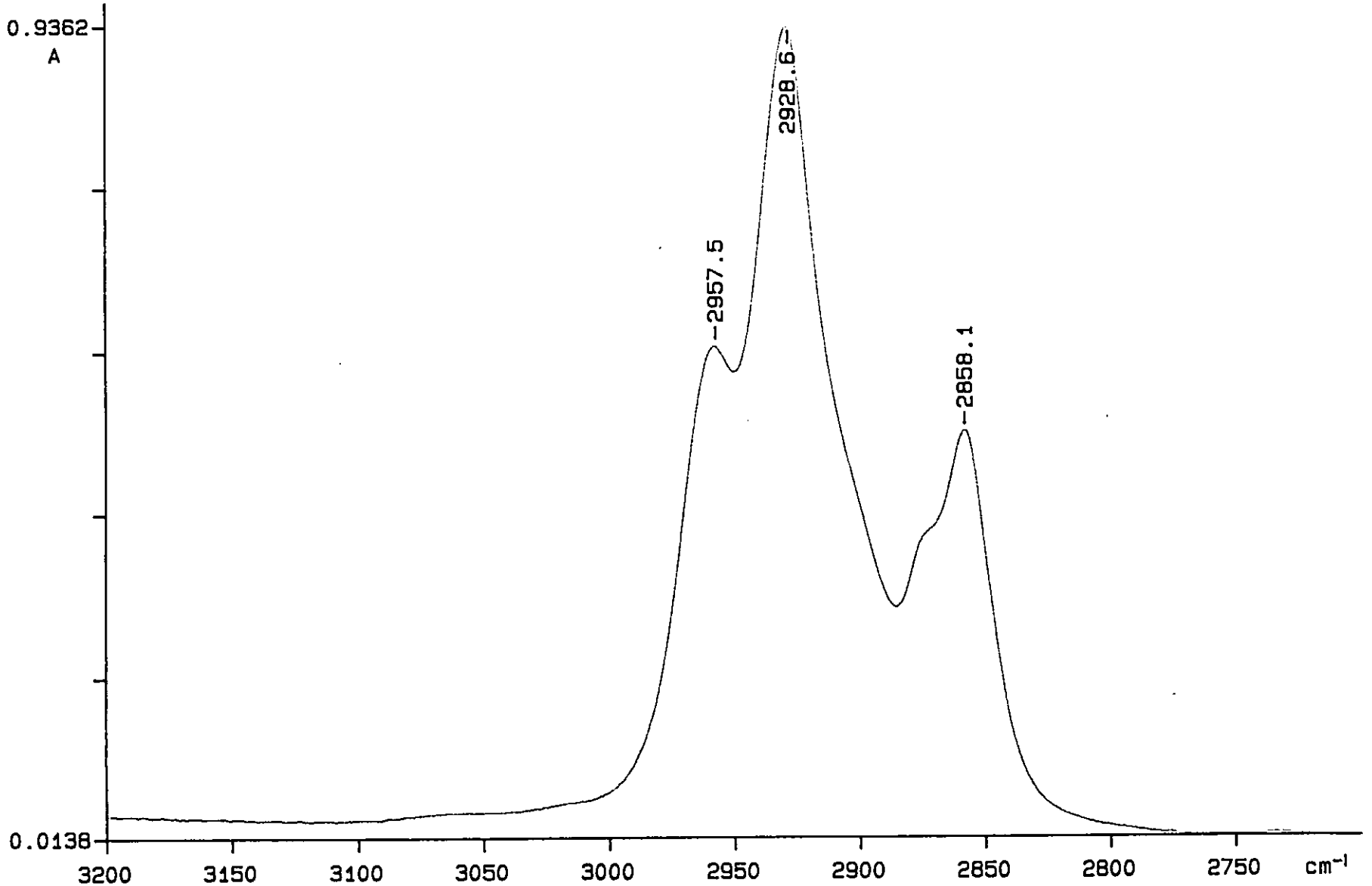
96/08/04 11:48 Loughborough Univ
ymrs8: 16 scans, 4.0cm-1, single, diff, flat, smooth



96/08/04 11:54 Loughborough Univ
ymrs8x2: 16 scans, 4.0cm-1, single, diff, flat, smooth

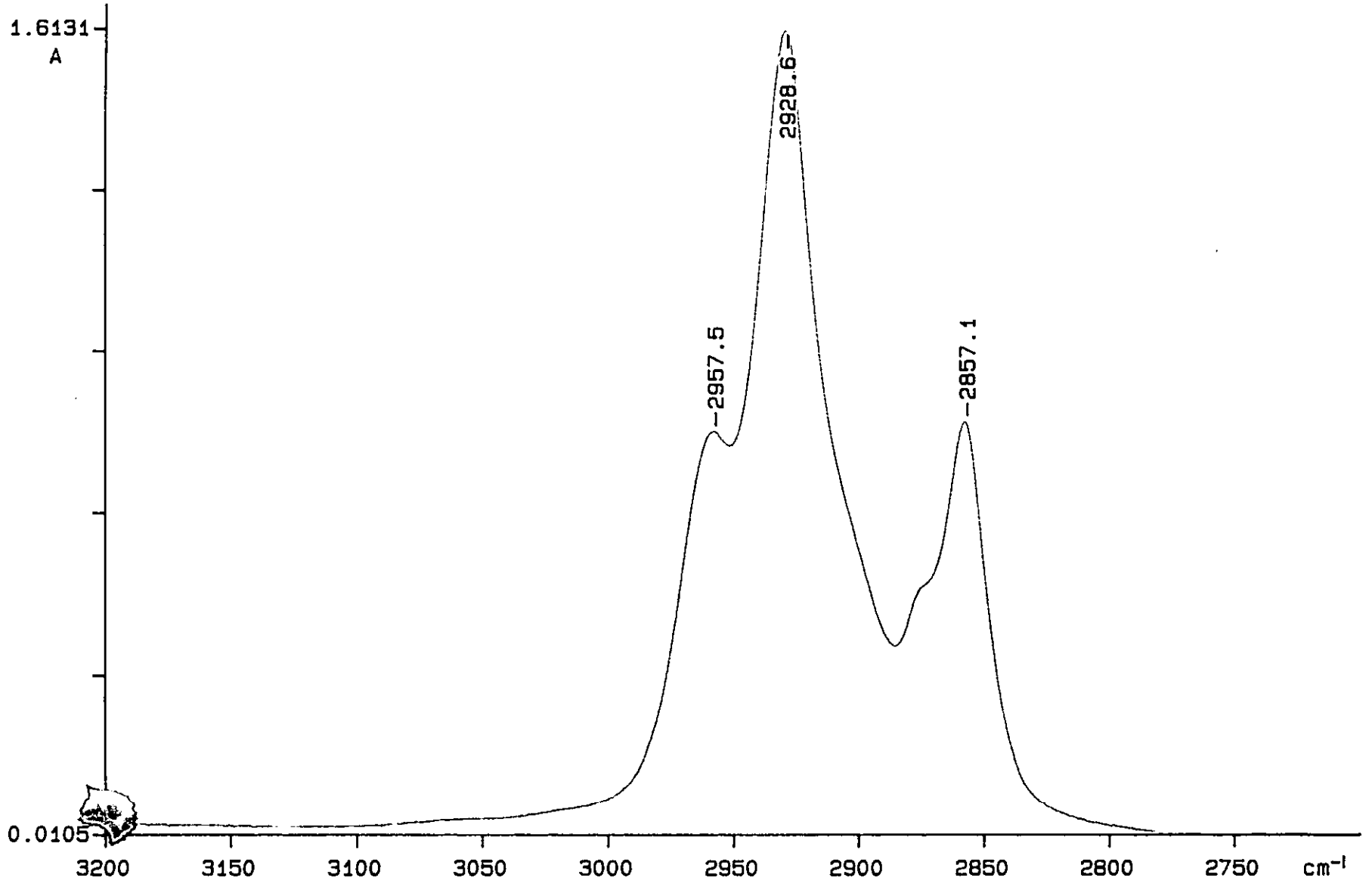


96/08/04 12:02 Loughborough Univ
ymri8: 16 scans, 4.0cm-1, single, diff, flat, smooth

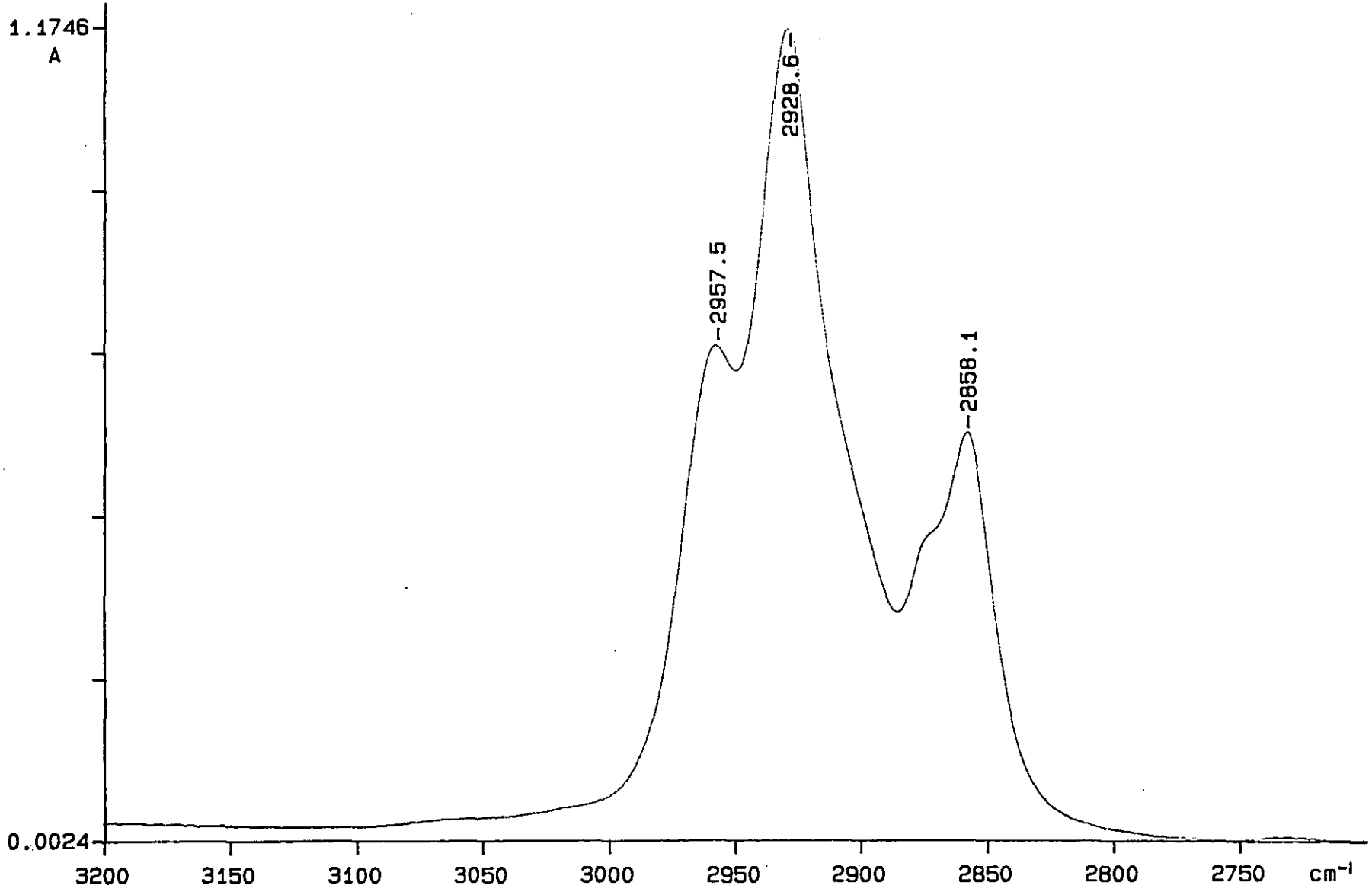


96/08/04 12:07 Loughborough Univ
ymri8x2: 16 scans, 4.0cm-1, single, diff, flat, smooth

PERKIN ELMER



96/08/04 12:14 Loughborough Univ
ymrc8: 16 scans, 4.0cm-1, single, diff, flat, smooth



96/08/04 12:21 Loughborough Univ
ymrc8x2: 16 scans, 4.0cm-1, single, diff, flat, smooth

DAY 12

sample 1B	
peak, (cm-1)	absorption
2957.5	0.7262
2928.6	1.2747
2857.1	0.6559
total abs	2.6569

sample 2B	
peak, (cm-1)	absorption
2957.5	0.5462
2928.6	0.8657
2858.1	0.4392
total abs	1.8506

sample 3S	
peak, (cm-1)	absorption
2957.5	0.6479
2928.6	1.0081
2858.1	0.5046
total abs	2.1606

sample 4S	
peak, (cm-1)	absorption
* CENTRIFUGE	
BOTTLE	
BROKE	
total abs	

sample 5I	
peak, (cm-1)	absorption
2957.5	0.8012
2929.7	1.3365
2858.1	0.7157
total abs	2.8534

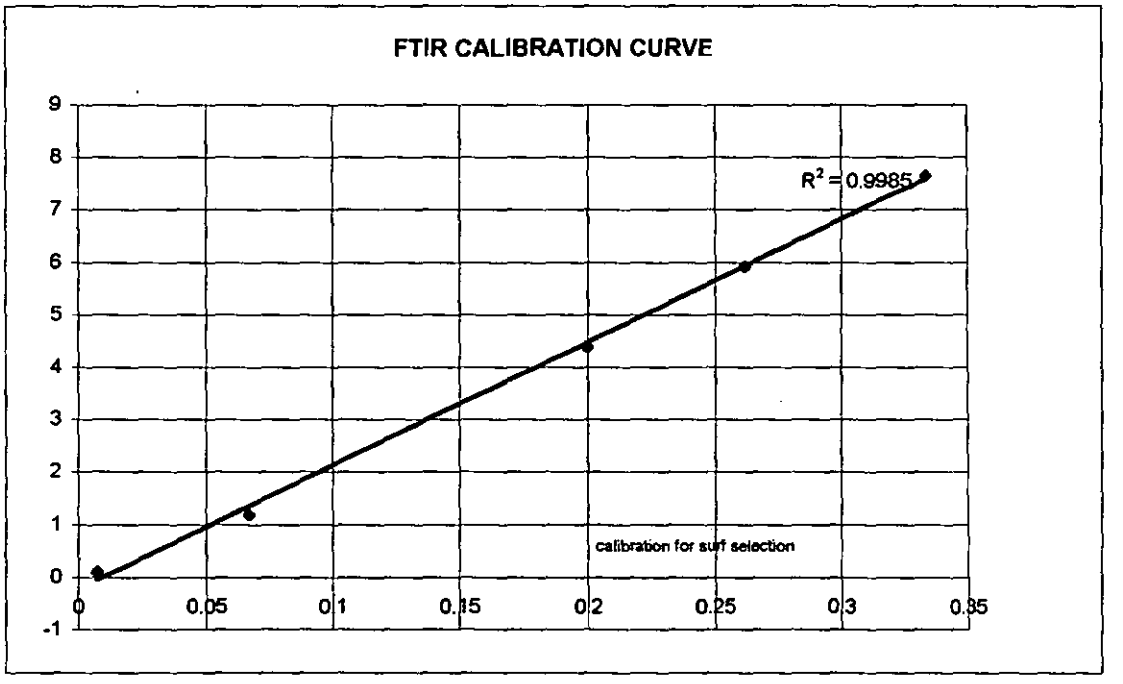
sample 6I	
peak, (cm-1)	absorption
2957.5	0.5172
2928.6	0.8015
2857.1	0.4049
total abs	1.7236

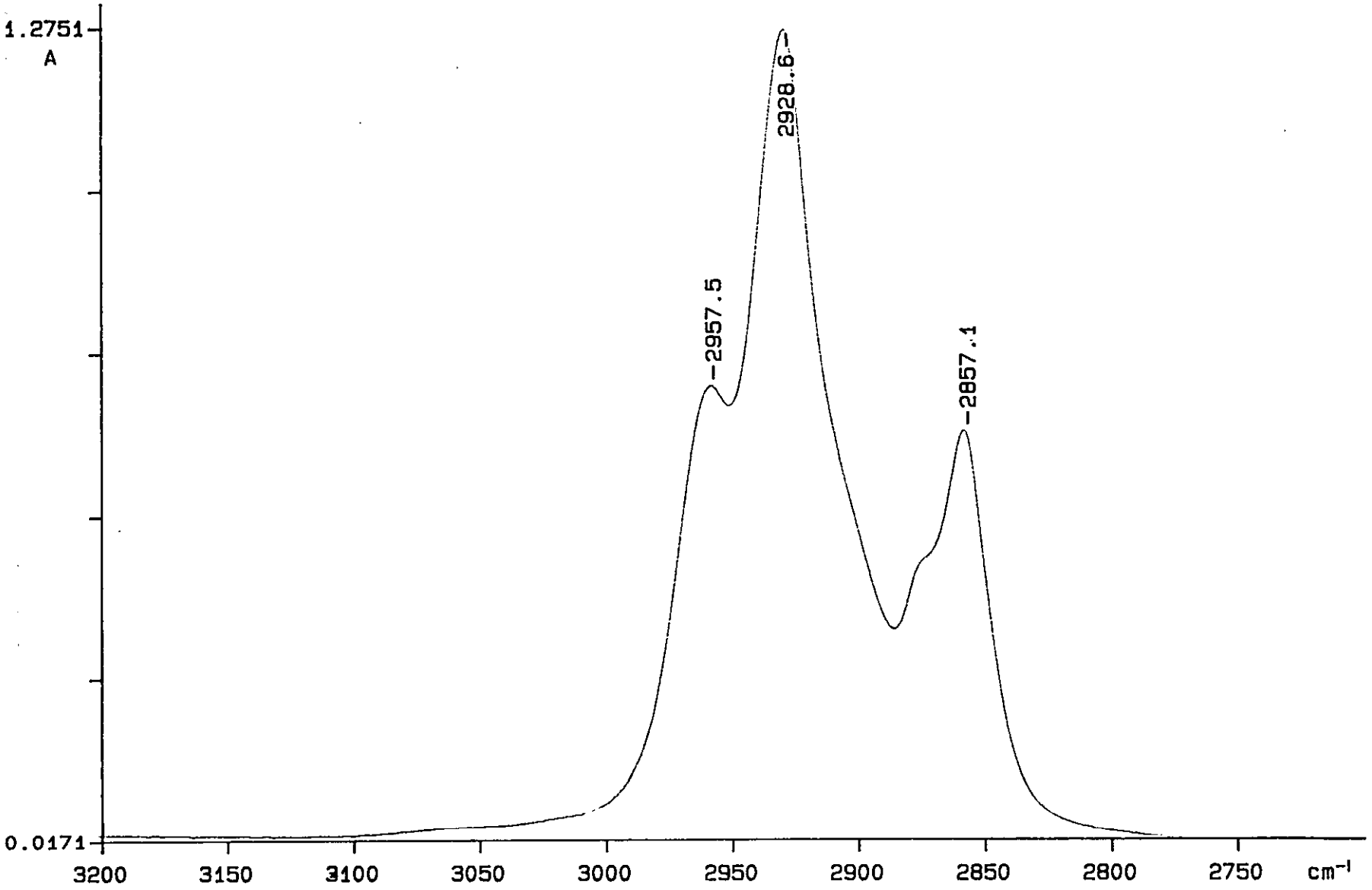
sample 7C	
peak, (cm-1)	absorption
2957.5	0.5341
2928.6	0.8281
2858.1	0.4141
total abs	1.7763

sample 8C	
peak, (cm-1)	absorption
2957.5	0.58
2928.6	0.9088
2857.1	0.4566
total abs	1.9454

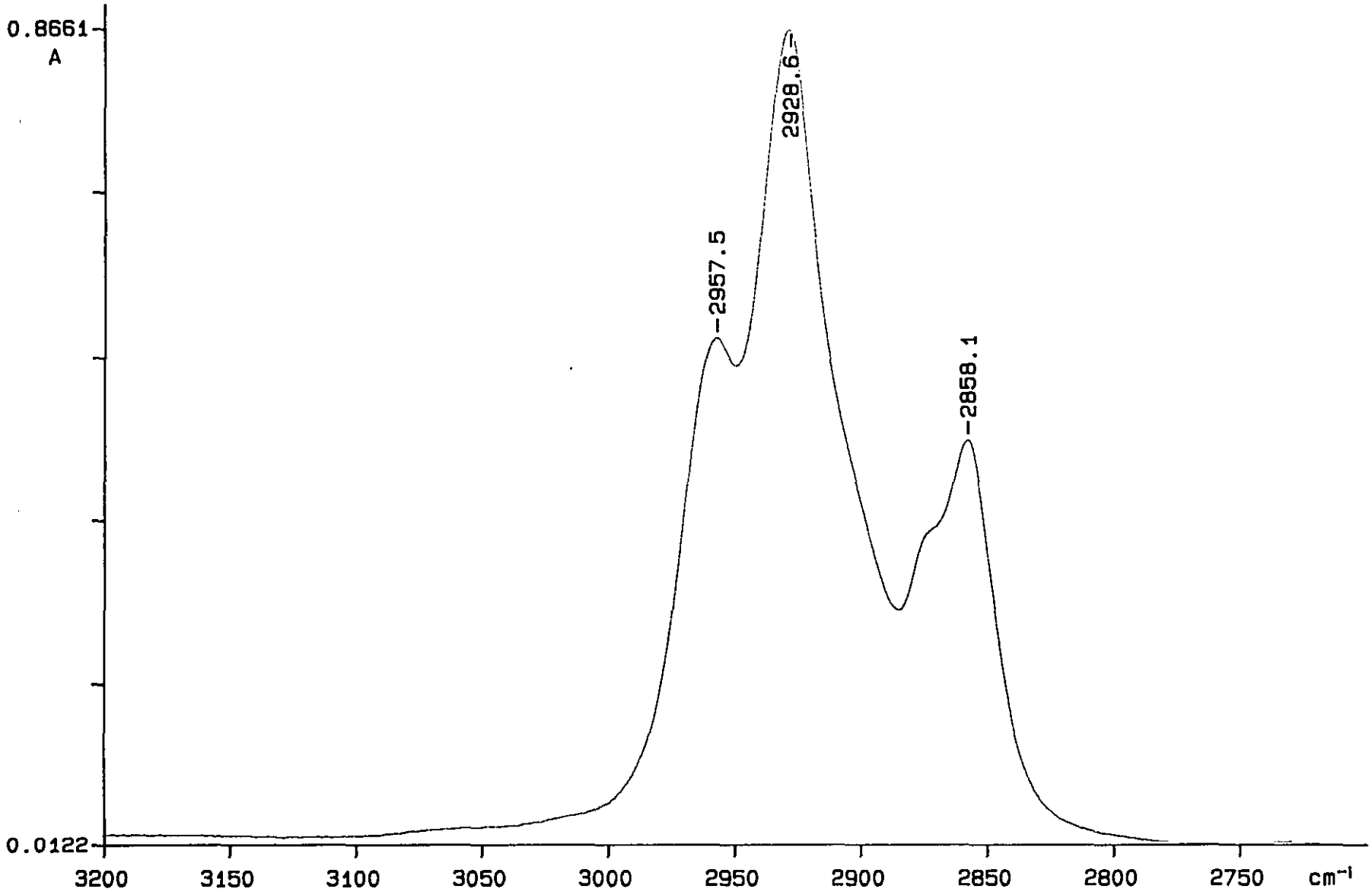
Conversion of absorbance to oil content based on calibration standard curve 2

sample	total abs	avg	extrapolate O&G (g)		Corr Fact	O&G (g)
1B	2.6569					
2B	1.8506	2.25375	0.105		1.06	0.1113
3S	2.1606					
4S	*	2.1066	0.1		1.02	0.102
5I	2.8534					
6I	1.7236	2.2885	0.108		0.98	0.1058
7C	1.7763					
8C	1.9454	1.86085	0.0902			0.0902

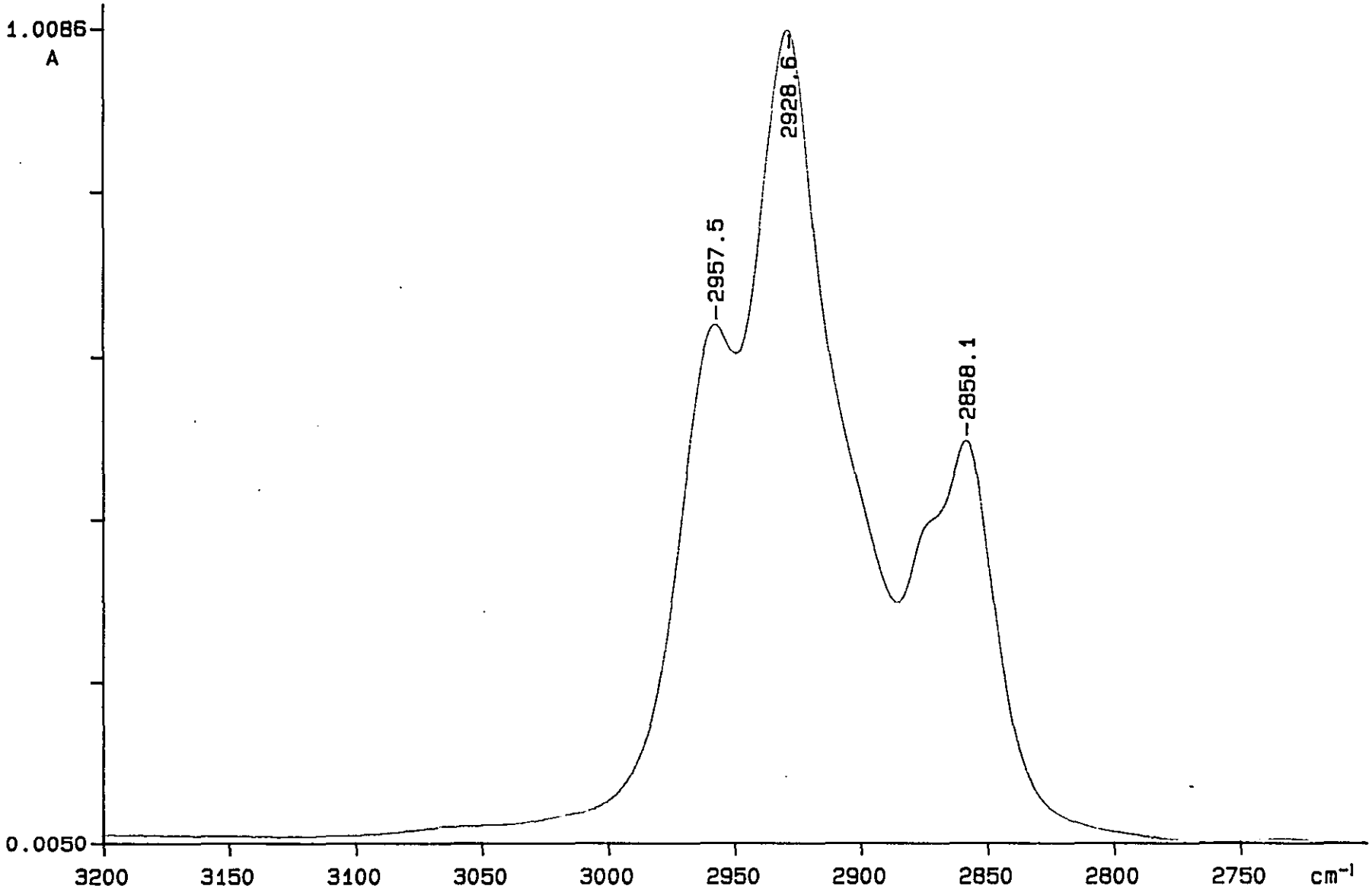




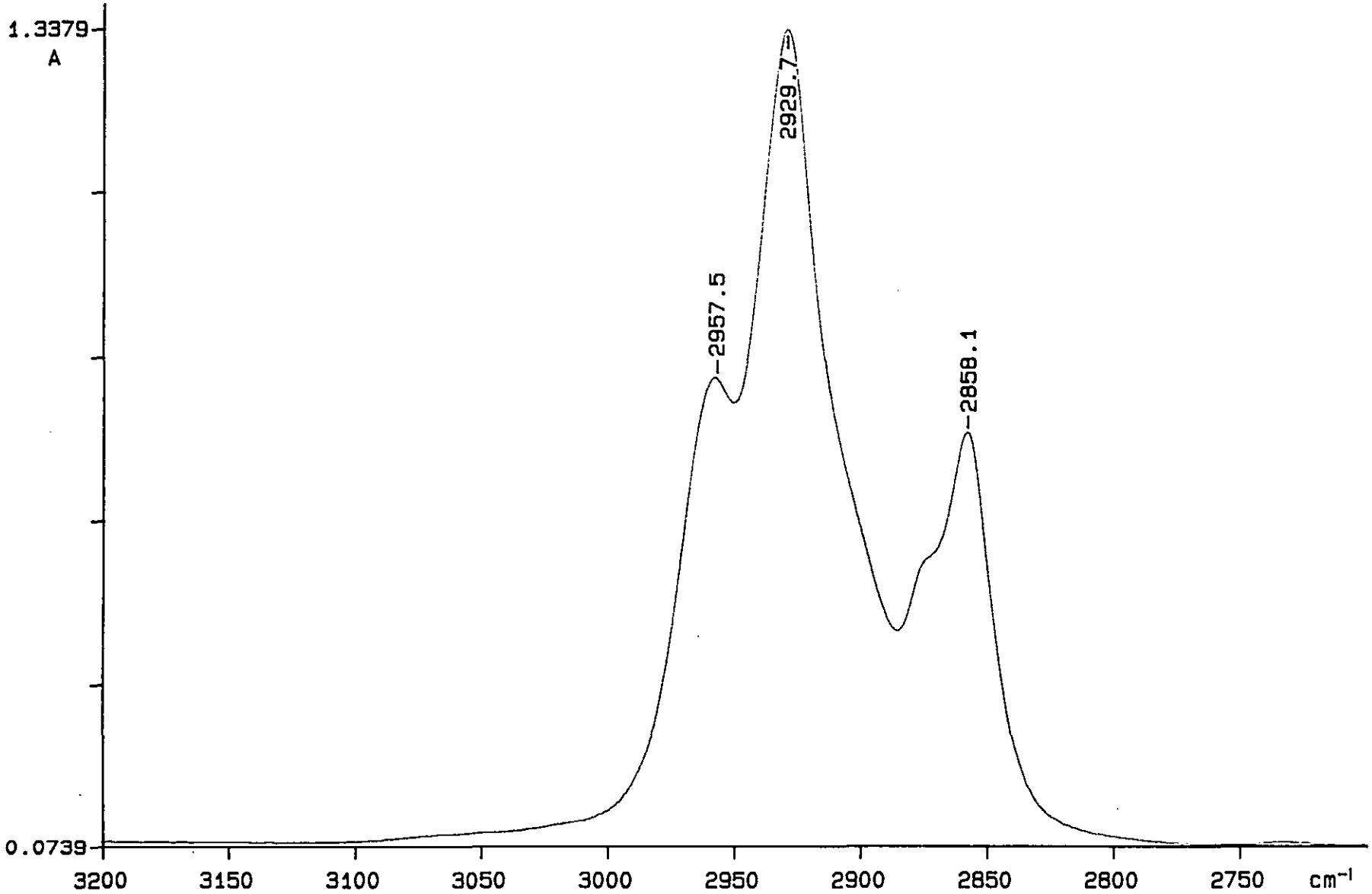
96/08/05 13: 11 Loughborough Univ
ymrb12: 16 scans, 4.0cm-1, single, diff, flat, smooth



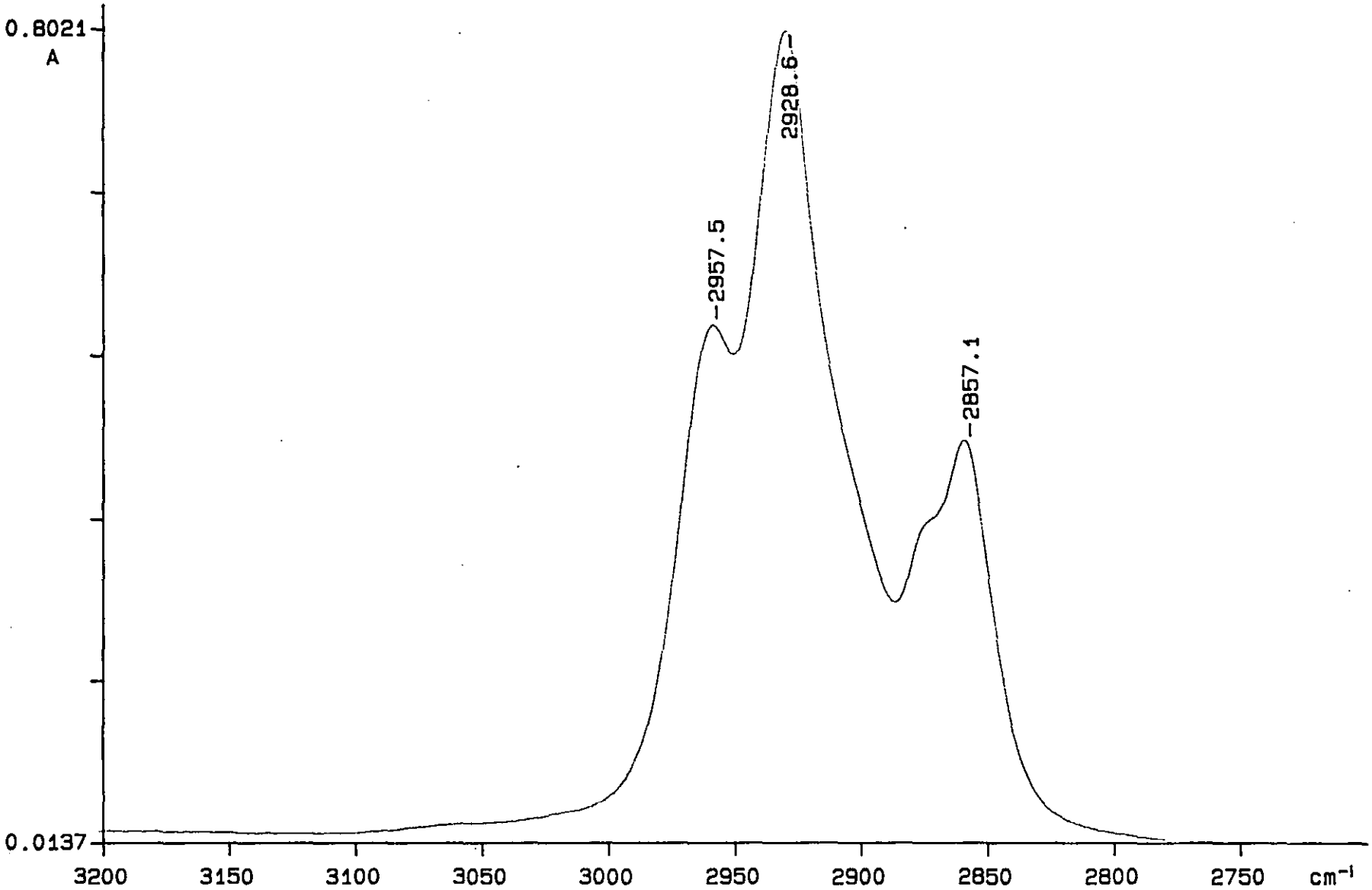
96/08/05 13:56 Loughborough Univ
ymrb12x2: 16 scans, 4.0cm-1, single, diff, flat, smooth



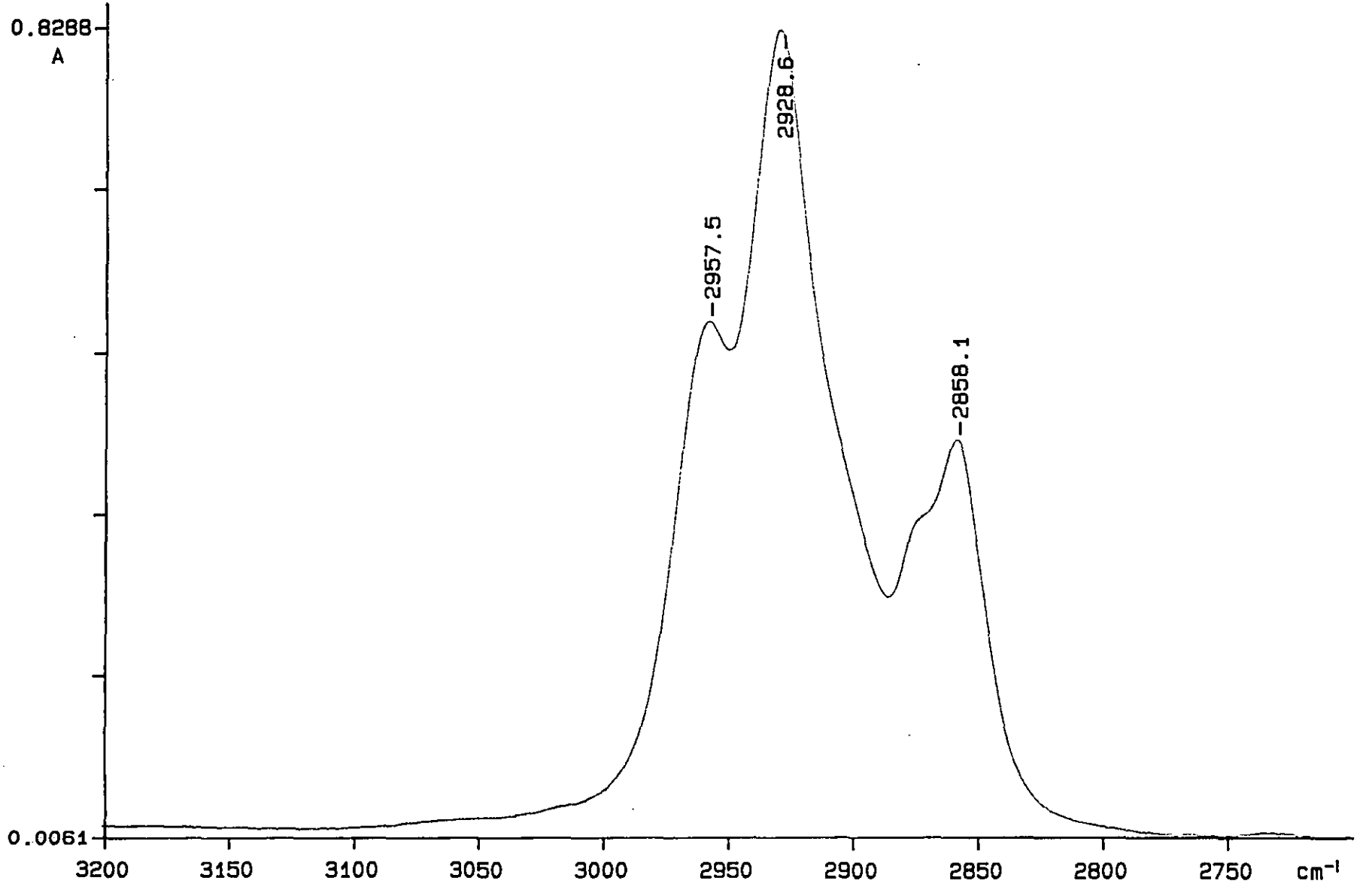
96/08/05 13:20 Loughborough Univ
ymrs12: 16 scans, 4.0cm-1, single, diff, flat, smooth



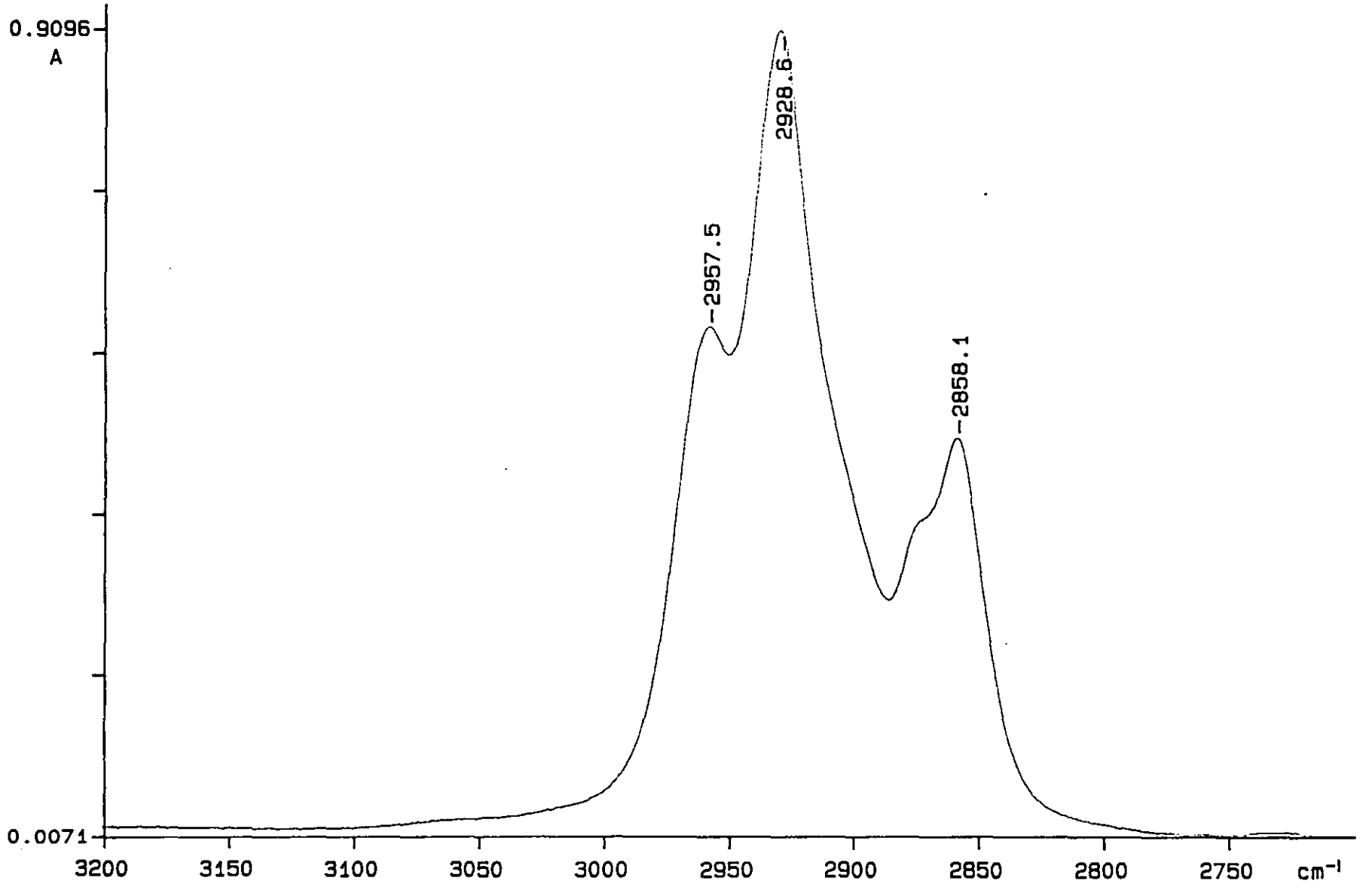
96/08/05 13:29 Loughborough Univ
ymri12: 16 scans, 4.0cm-1, single, diff, flat, smooth



96/08/05 14:21 Loughborough Univ
ymri12x2: 16 scans, 4.0cm-1, single, diff, flat, smooth



96/08/05 13:38 Loughborough Univ
ymrc12: 16 scans, 4.0cm-1, single, diff, flat, smooth



96/08/05 14:34 Loughborough Univ
ymrc12x2: 16 scans, 4.0cm-1, single, diff, flat, smooth

TESTING THE ADDITION OF SURFACTANT TO SLUDGE OR MIXED LIQUOR

sample 1A inipol 1	
peak, (cm-1)	absorption
2958.5	0.4243
2929.1	8151
2857.5	0.4407
total abs	1.6801

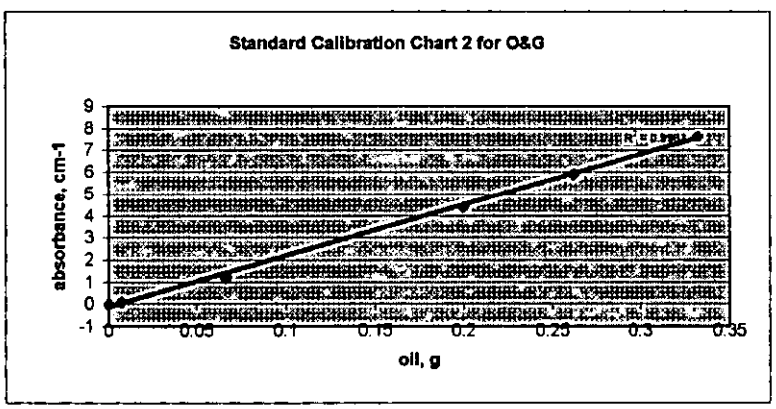
sample 1B it2	
peak, (cm-1)	absorption
2958.3	0.3563
2929	0.6768
2857.5	0.3702
total abs	1.4033

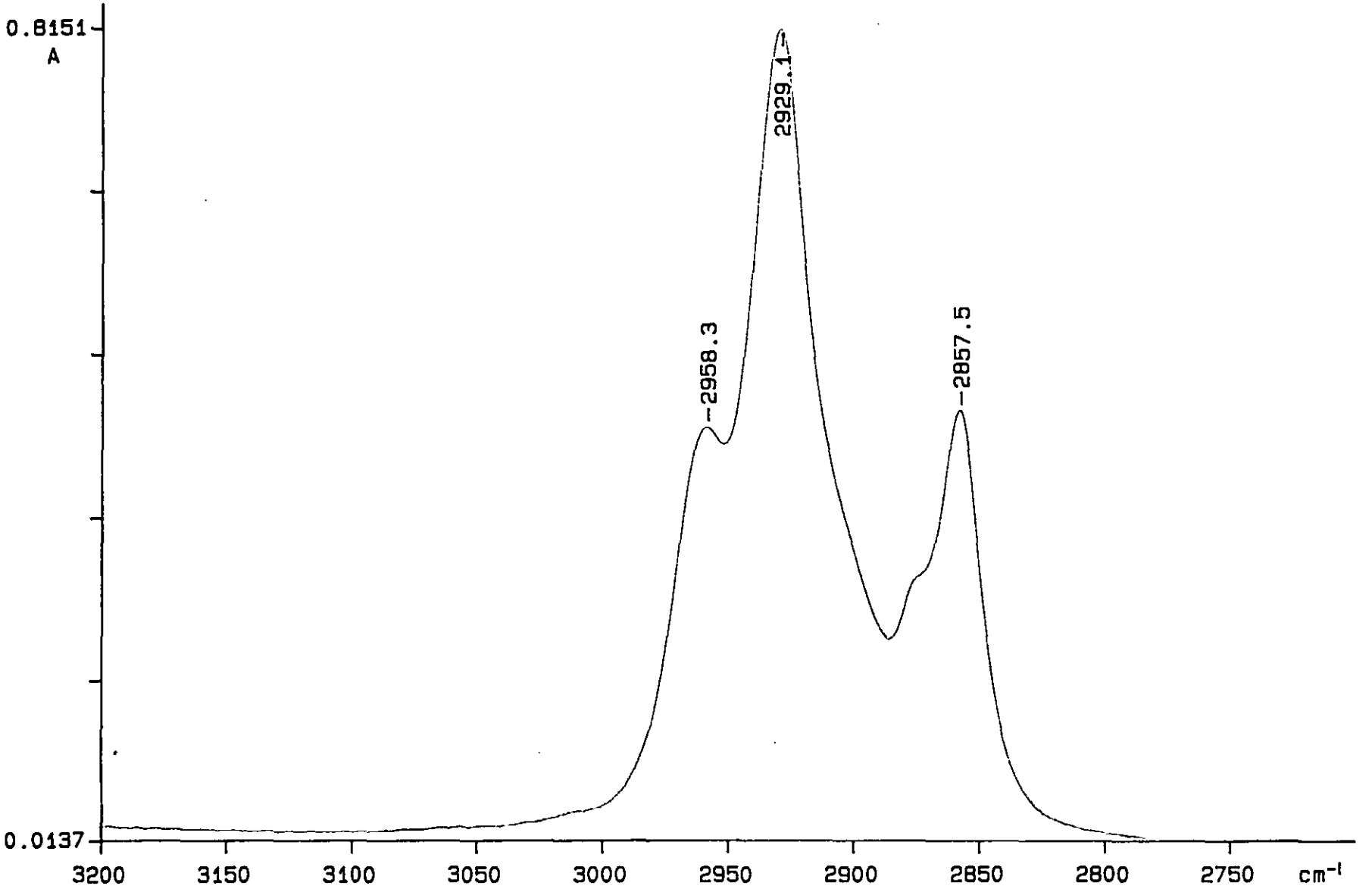
sample 2A it3b	
peak, (cm-1)	absorption
2959.6	0.1106
2928.4	0.2008
2858.1	0.1116
total abs	0.423

sample 2B it4b	
peak, (cm-1)	absorption
2958.5	0.251
2929.7	0.463
2858.1	0.2634
total abs	0.9774

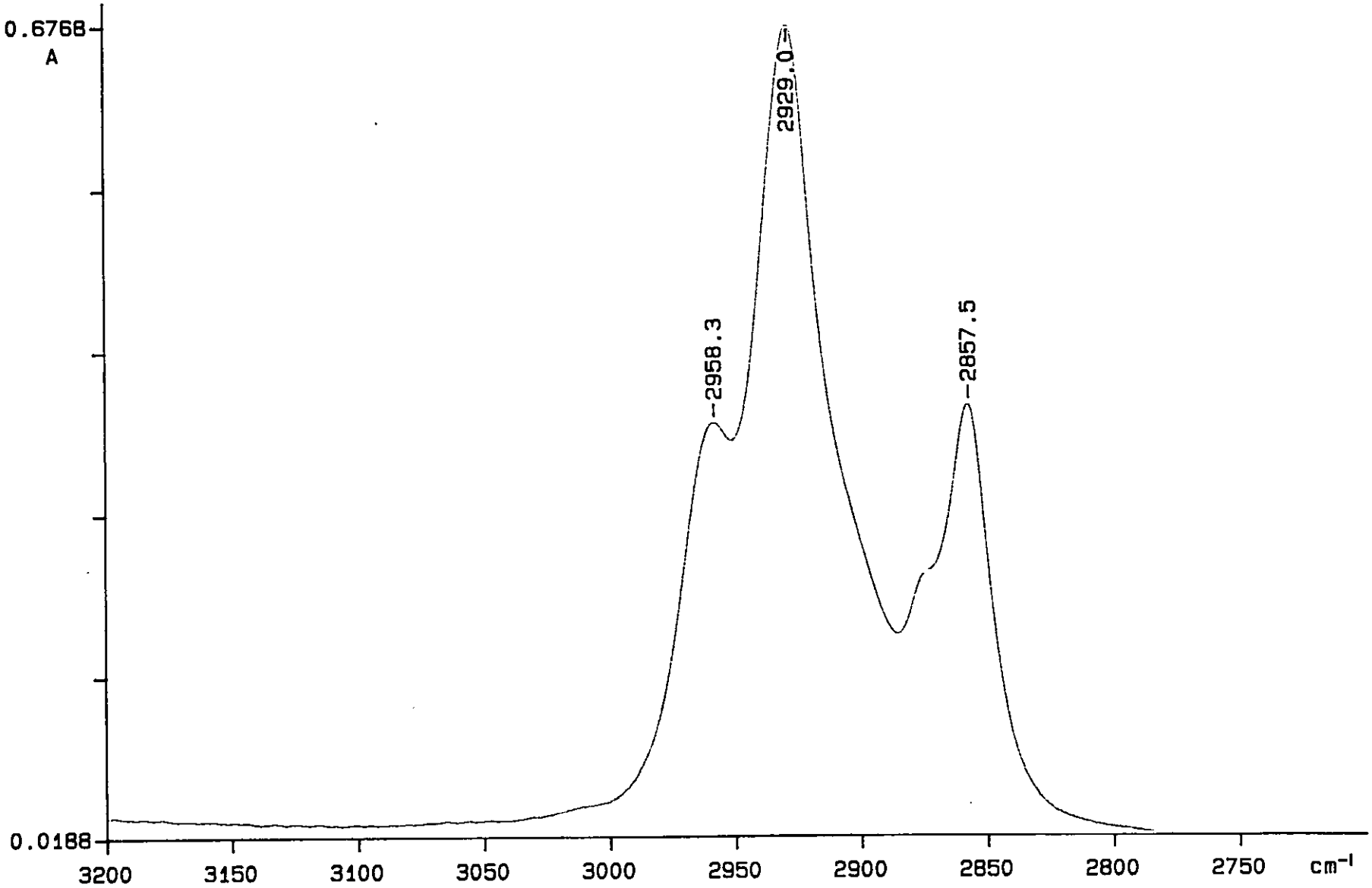
Conversion of absorbance to oil content based on calibration std 2

sample	total abs	extrapolate O&G (g)		Avg O&G (g)
1A	1.6801	0.083		0.0755
1B	1.4033	0.068		
2A	0.423	0.028		0.0385
2B	0.9774	0.049		

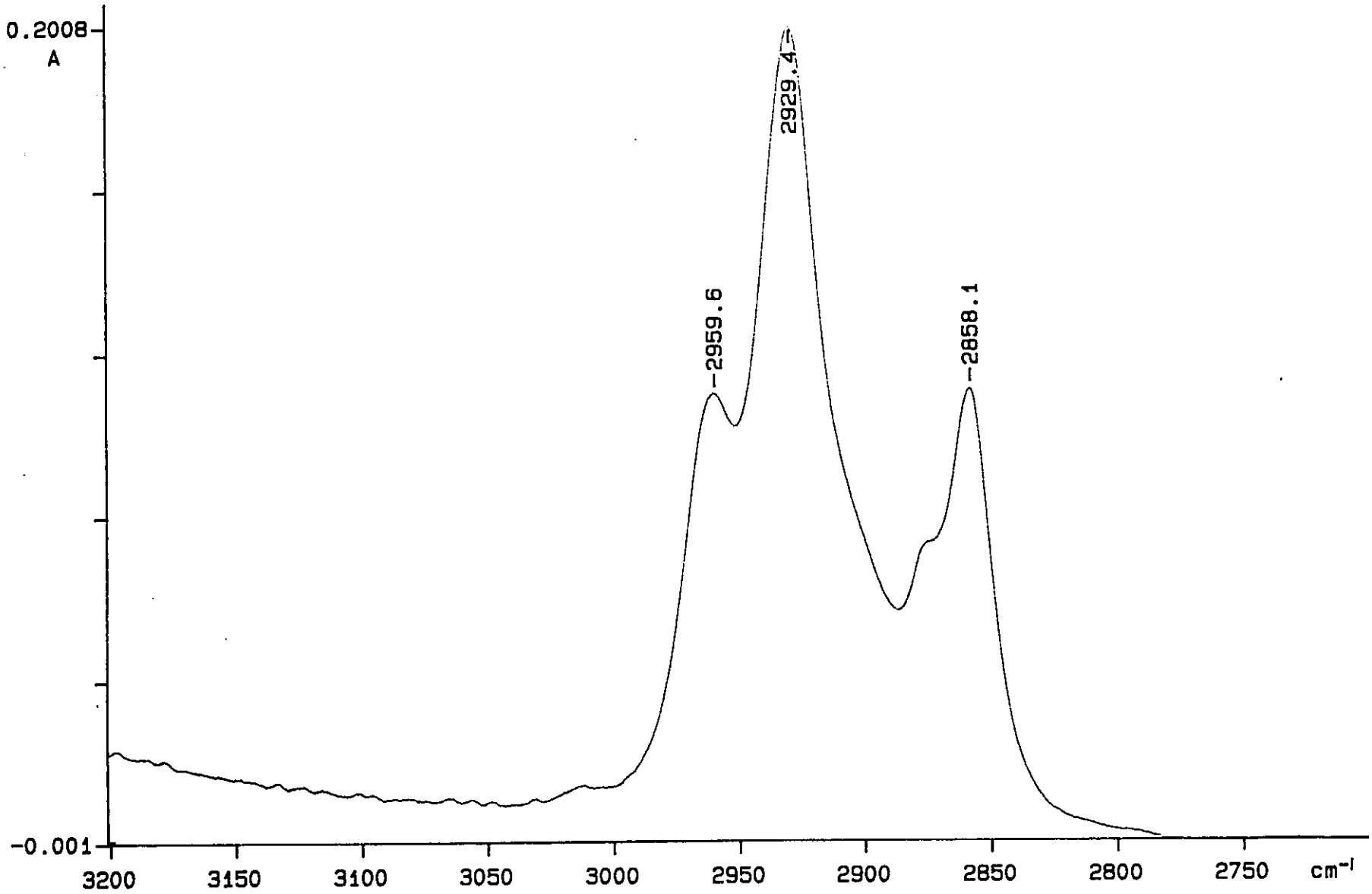




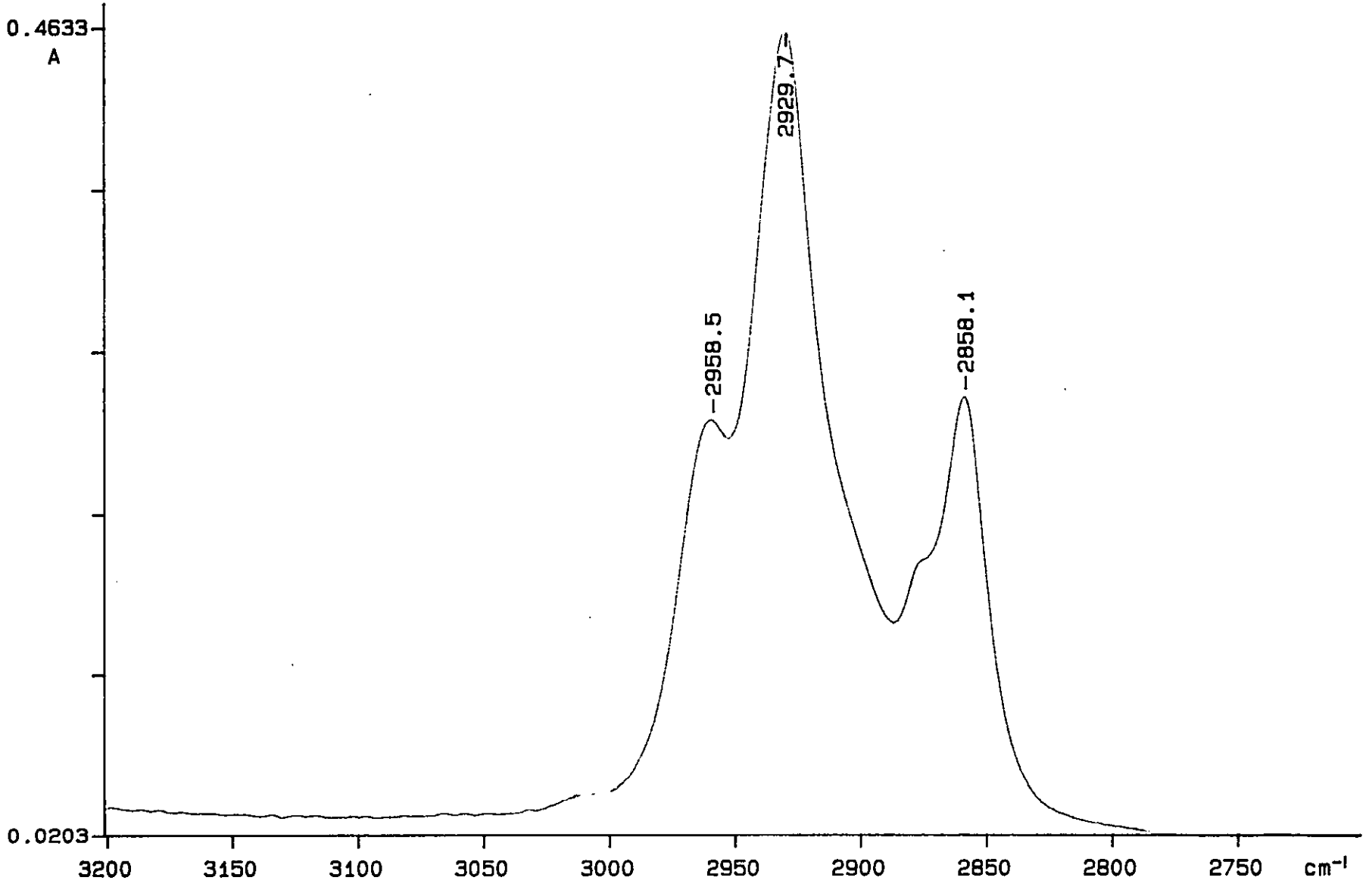
96/08/06 11:26 Loughborough Univ
it1: 16 scans, 4.0cm-1, single, diff, flat, smooth
inipol1



96/08/06 11:32 Loughborough Univ
it2: 16 scans, 4.0cm-1, single, diff, flat, smooth



96/08/06 11:40 Loughborough Univ
it3b: 16 scans, 4.0cm-1, single, diff, flat, smooth



96/08/06 12:46 Loughborough Univ
it4b: 16 scans, 4.0cm-1, single, diff, flat, smooth

SET 2 – TRACER CHARTS

- AIRLIFT BSTR
- BASIC BSTR

TRACER INDEX FOR AIRLIFT STR

	Standard Used		
Chart no	Listan	% solids	Mixing cond.
20	5	0	air
24	9	0	air
27	12	0	air
18	4	0	stir
25	9	0	stir
28	12	0	stir
16	3	0	both
29	13	0	both
32	16	5	air
34	16	5	air
31	12	5	stir
35	15	5	stir
15	2	5	both
33	16	5	both
36	16	5	both
41	19	10	air
42	19	10	air
39	18a	10	stir
40	18b	10	stir
37	17a	10	both
38	17b	10	both

TRACER INDEX FOR BASIC STR

		Mixing Cond.	
Chart name	Standard Used	Stirrer speed	Air Flow
		rpm	L/m
BSTR 1	Li Std 1	150	2
BSTR 2	Li Std 2	250	2
BSTR 3	Li Std 3	150	4
BSTR 4A	Li Std 4	250	4
BSTR 4B	Li Std 4	250	4
BSTR 5	Li Std 5	150	6
BSTR 6	Li Std 6	250	6
BSTR 7	Li Std 7	flood point	4

AIRLIFT STR

0 % solids

Tracer	Listan	Mixing	Cm/Ct	range	equil time	range
20	5	air	0.92	0.92-1.02	1m20 s	1m20s
24	9	air	1.02		1m20s	
27	12	air	1.02		1m20s	
18	4	stir	1.05	1.02-1.05	3m20s	3m20s-3m50s
25	9	stir	1.02		3m20s	
28	12	stir	1.02		3m50	
16	3	both	0.943	0.94-1.04	2m	1m40s-2m
29	13	both	1.04		1m40s	

5% solids

Tracer	Listan	Mixing	Cm/Ct	range	equil time	range
32	16	air	0.995	1-1.03	1m40s	1m20s
34	16	air	1.027		1m40s	
31	12	stir	1.176	1.12-1.18	5 m	5 m
35	15	stir	1.121		5m	
15	2	both	0.943	0.94-1.08	40s	40s-1m20s
33	16	both	1.075		40s	
36	16	both	1.042		1m20s	

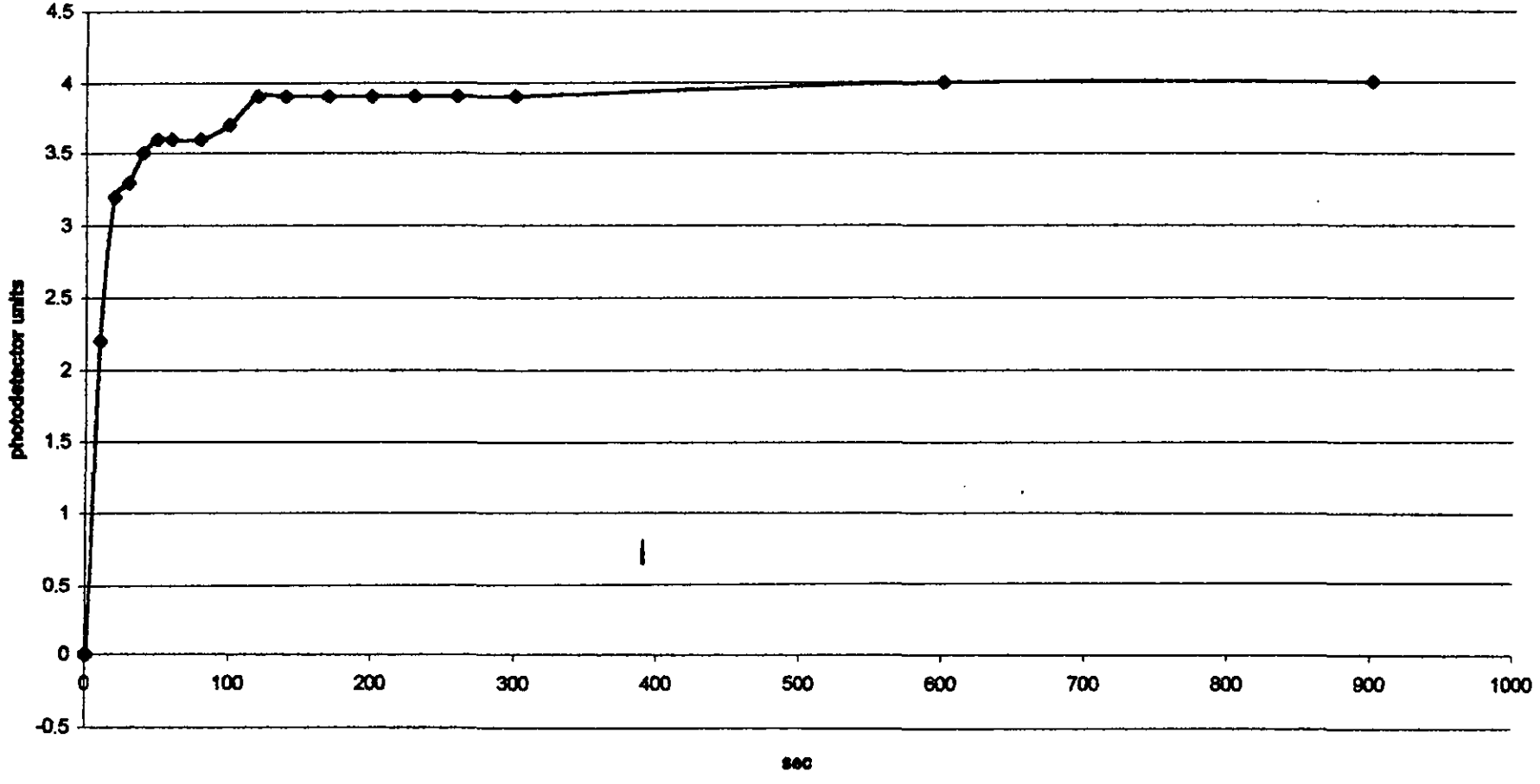
10 % solids

Tracer	Listan	Mixing	Cm/Ct	range	equil time	range
41	19	air	1.094	1.08-1.09	4m	3m20s-4m
42	19	air	1.0816		3m20s	
39	18a	stir	1.138	1.14	3m50s	3m50s-5m
40	18b	stir	1.148		5m	
37	17a	both	0.926	0.93-1.08	1m20s	1m20s
38	17b	both	1.08		1m20s	

BASIC STR

		Mixing Cond.			
Chart name	Standard	Stirrer sp	Air Flow	Cm/Ct	Equil time
		rpm	L/m		
BSTR 1	Li Std 1	150	2	0.97	20s
BSTR 2	Li Std 2	250	2	1.13	30s
BSTR 3	Li Std 3	150	4	1.06	20s
BSTR 4A	Li Std 4	250	4	1.03	30s
BSTR 4B	Li Std 4	250	4	0.95	40s
BSTR 5	Li Std 5	150	6	0.93	50s
BSTR 6	Li Std 6	250	6	1	20s
BSTR 7	Li Std 7	flood point	4	1.16	60s

CHART 20


4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
photodetector units
0
100
200
300
400
500
600
700
800
900
1000
sec

LITHIUM STANDARD 5

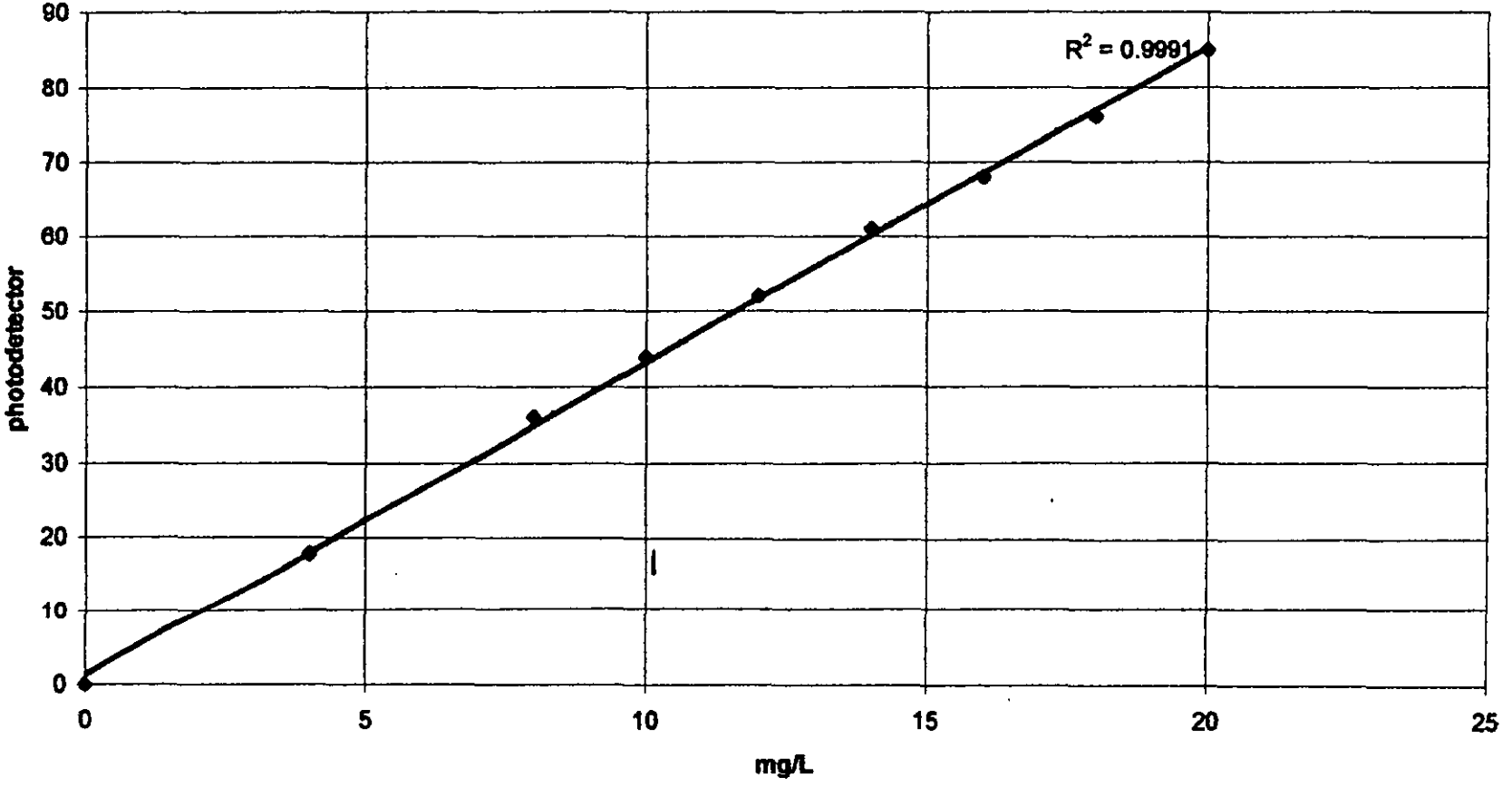
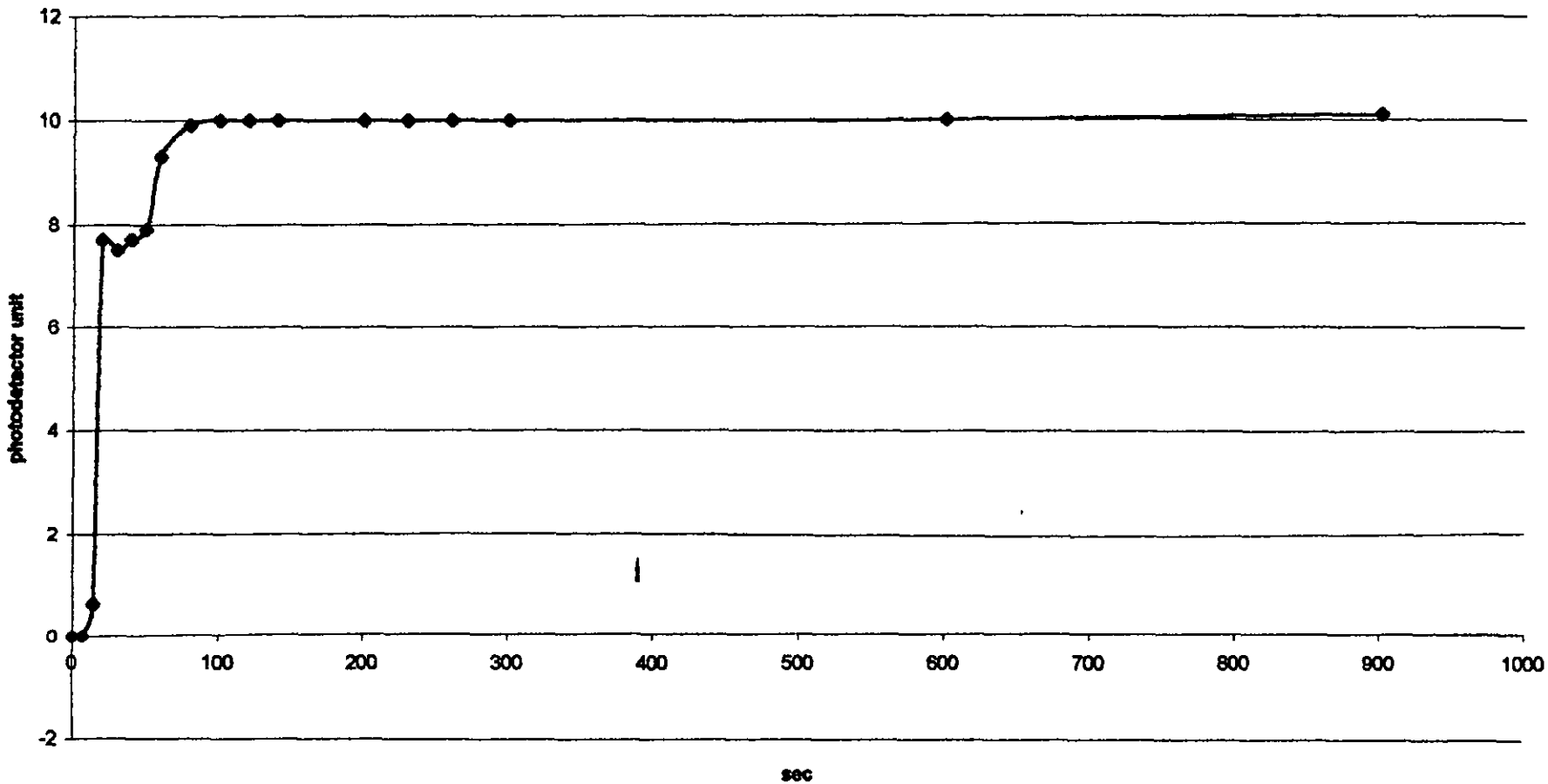


CHART 24


12
10
8
6
4
2
0
-2
photodetector unit
0
100
200
300
400
500
600
700
800
900
1000
sec

LITHIUM STANDARD 9

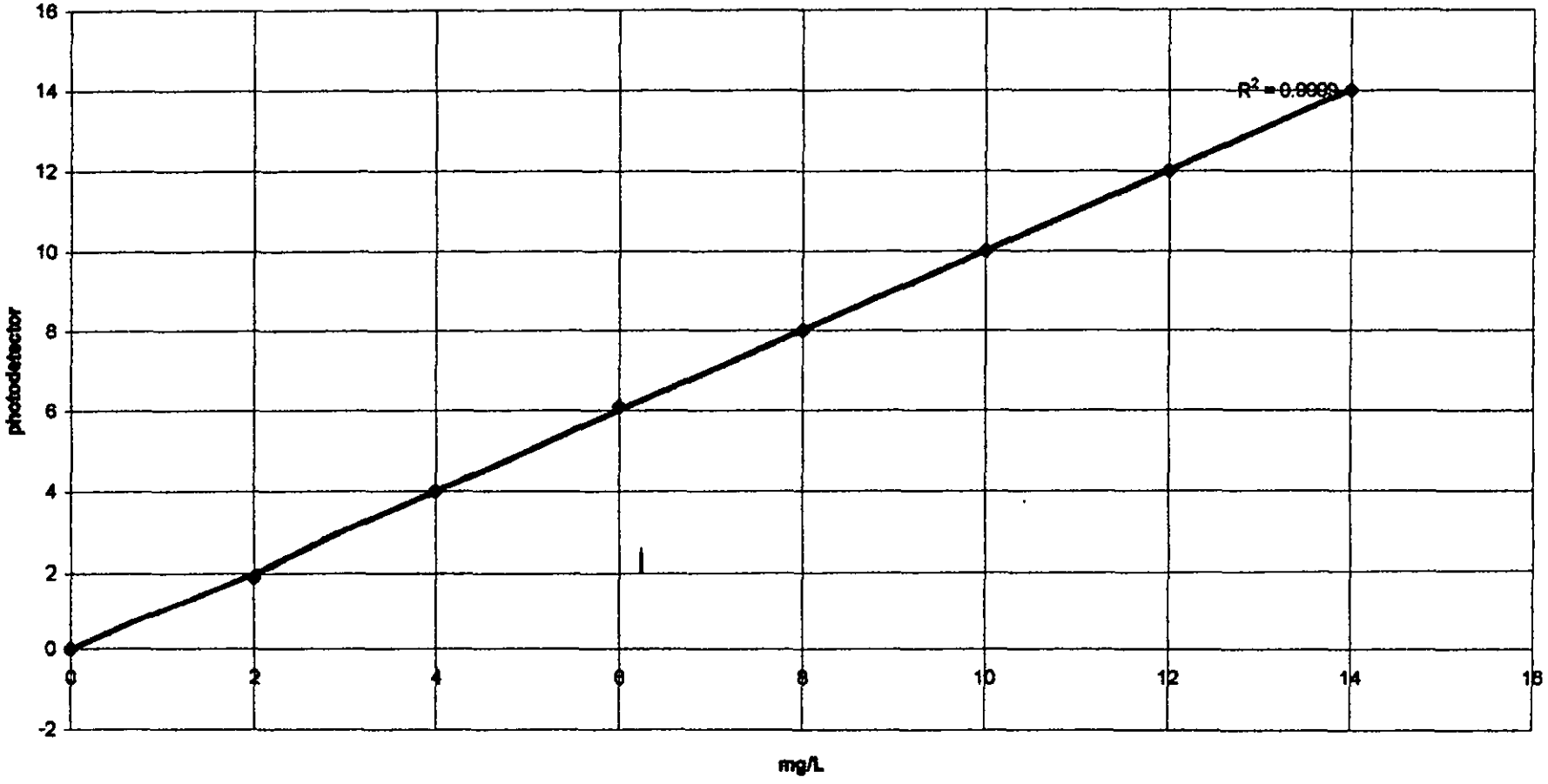
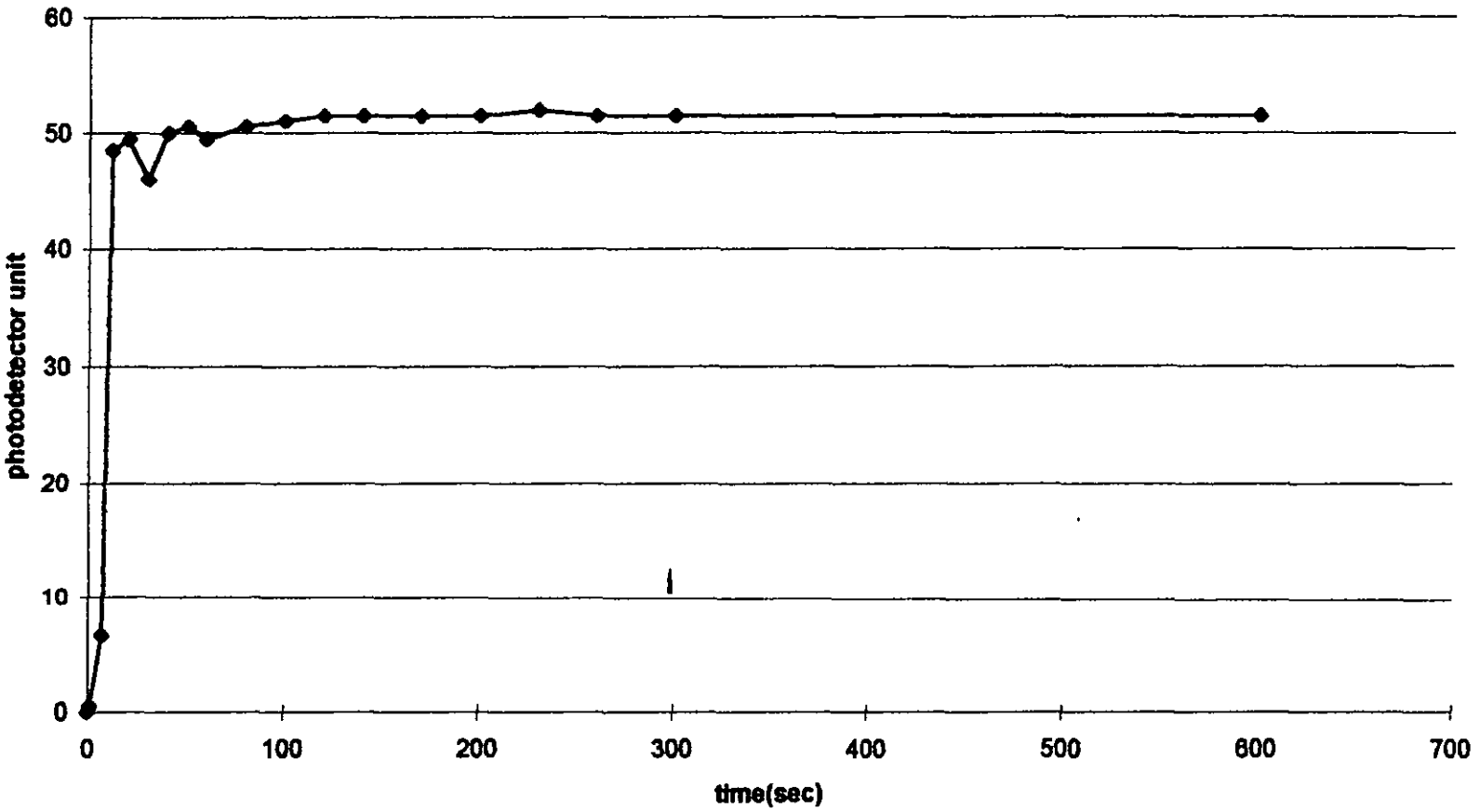


CHART 27


60
50
40
30
20
10
0
photodetector unit
0
100
200
300
400
500
600
700
time(sec)

LITHIUM STANDARD 12

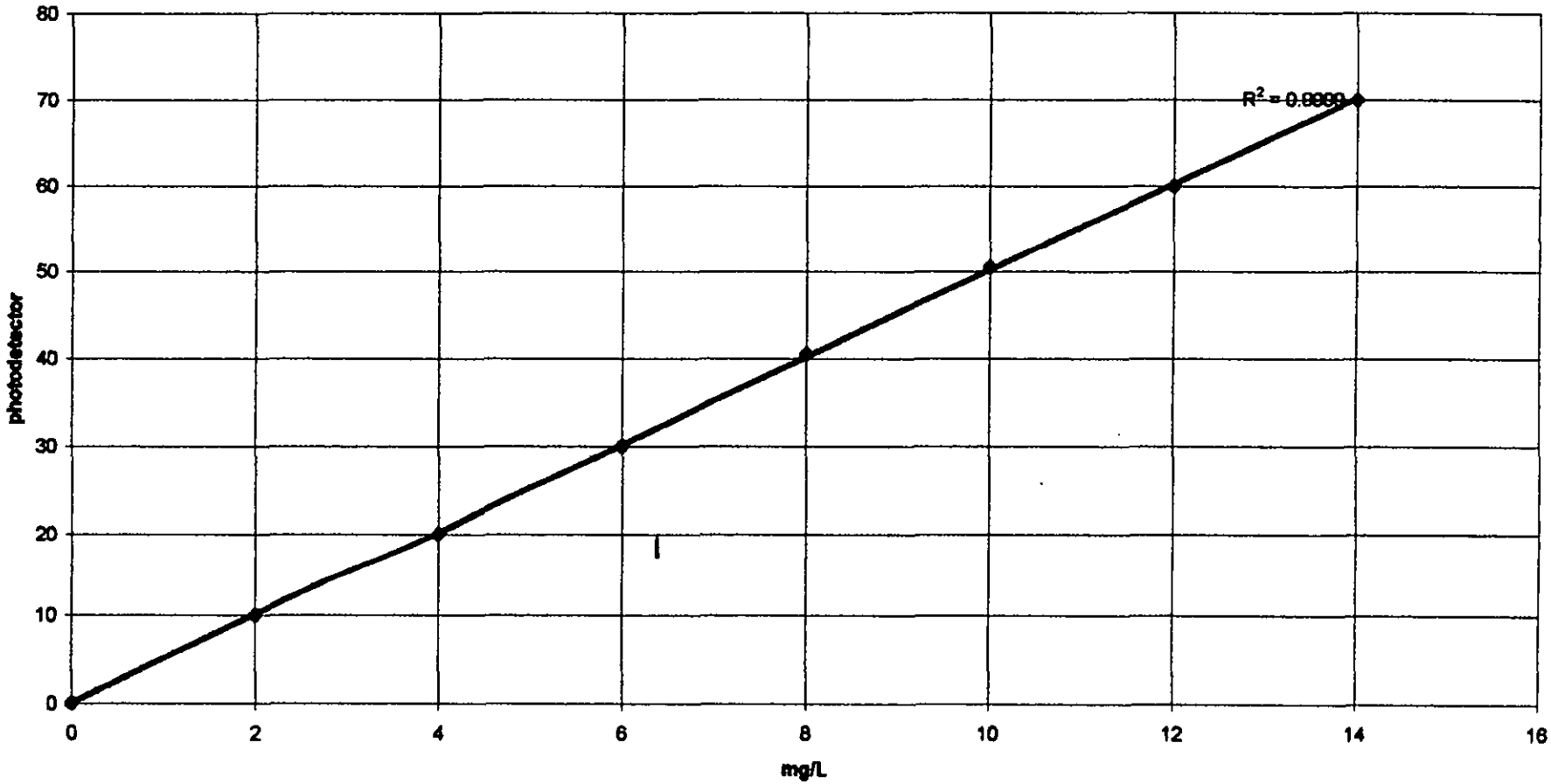
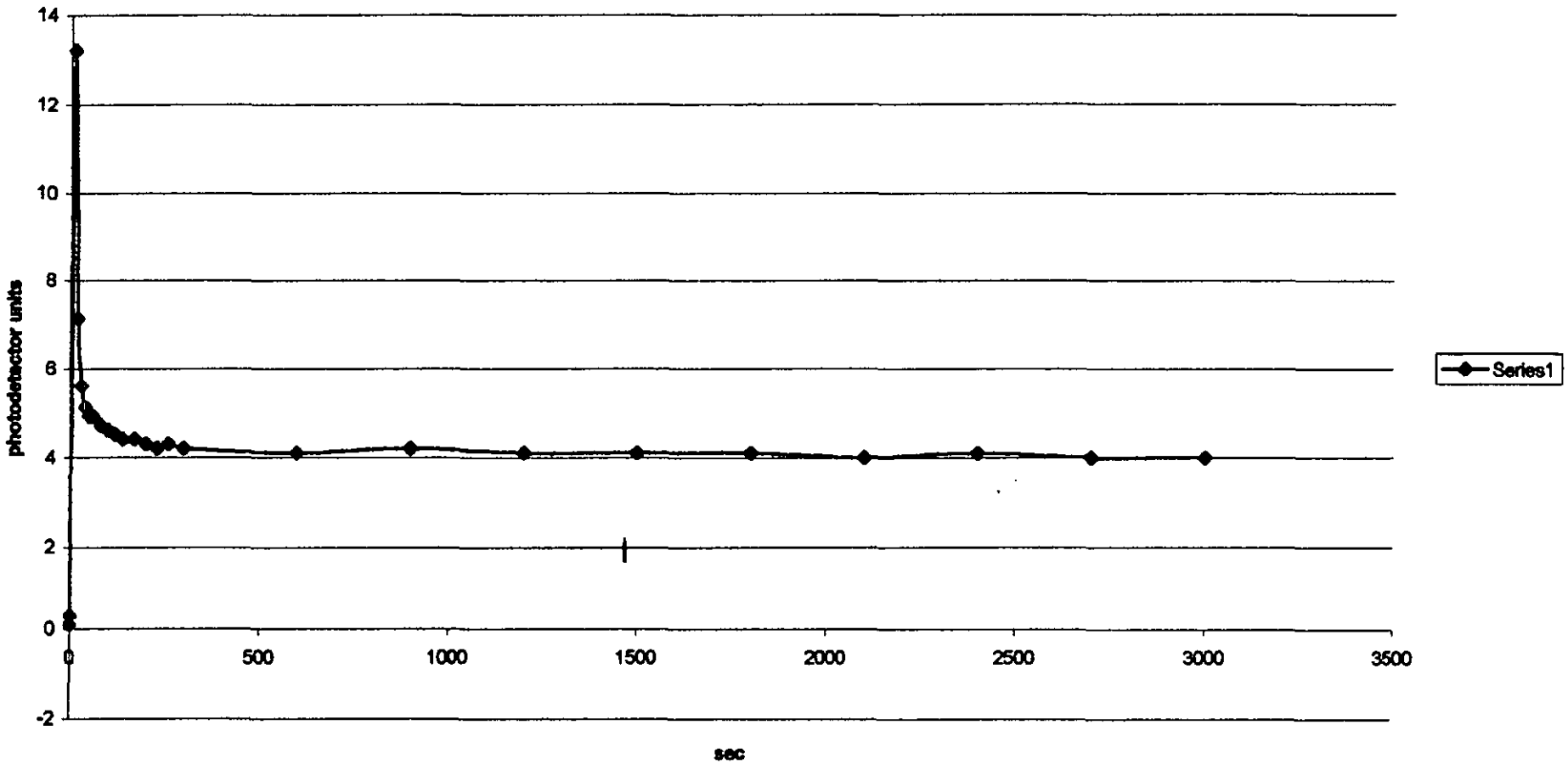


CHART 18


14
12
10
8
6
4
2
0
-2
photodetector units
0
500
1000
1500
2000
2500
3000
3500
sec
Series1

LITHIUM STANDARD 4

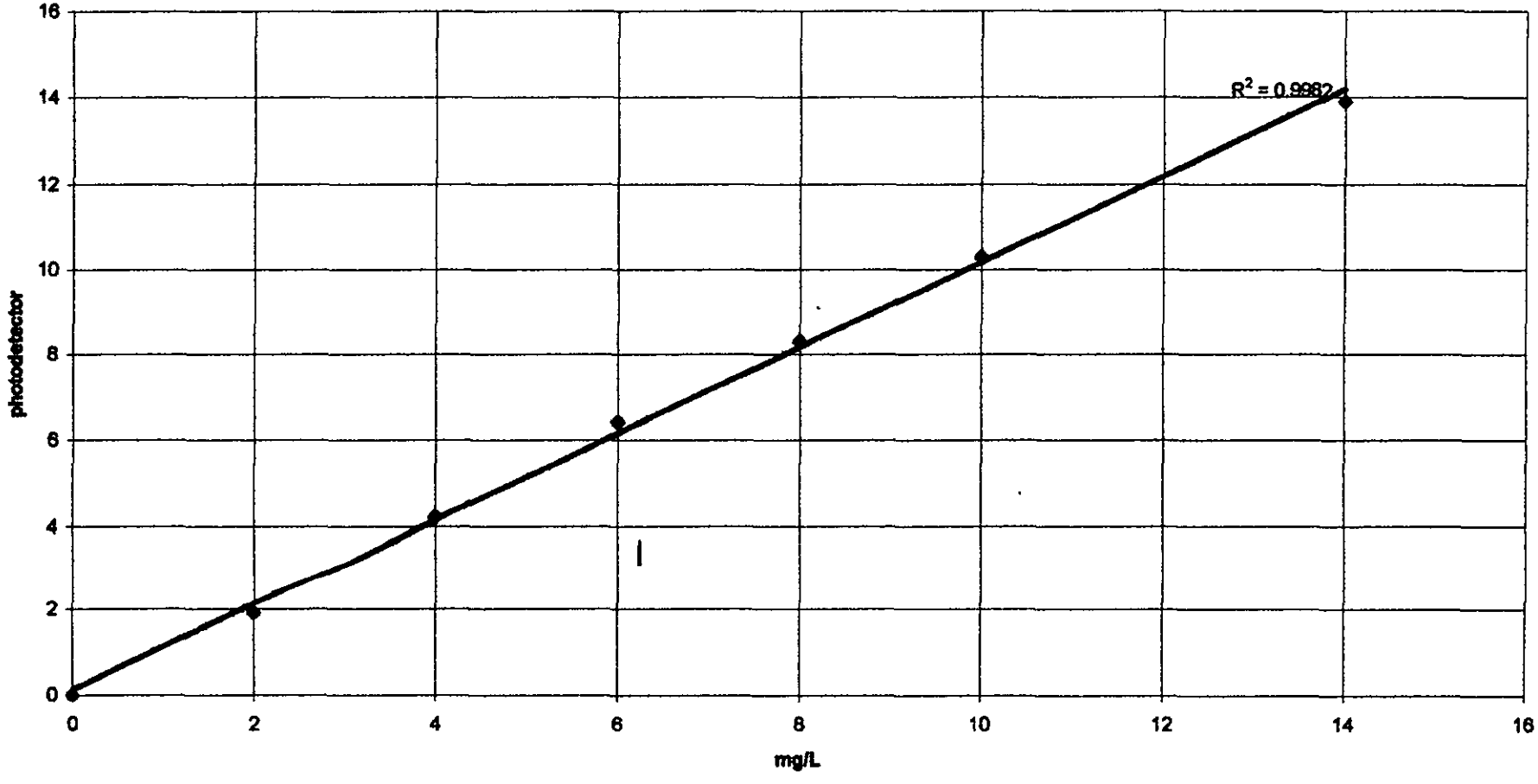
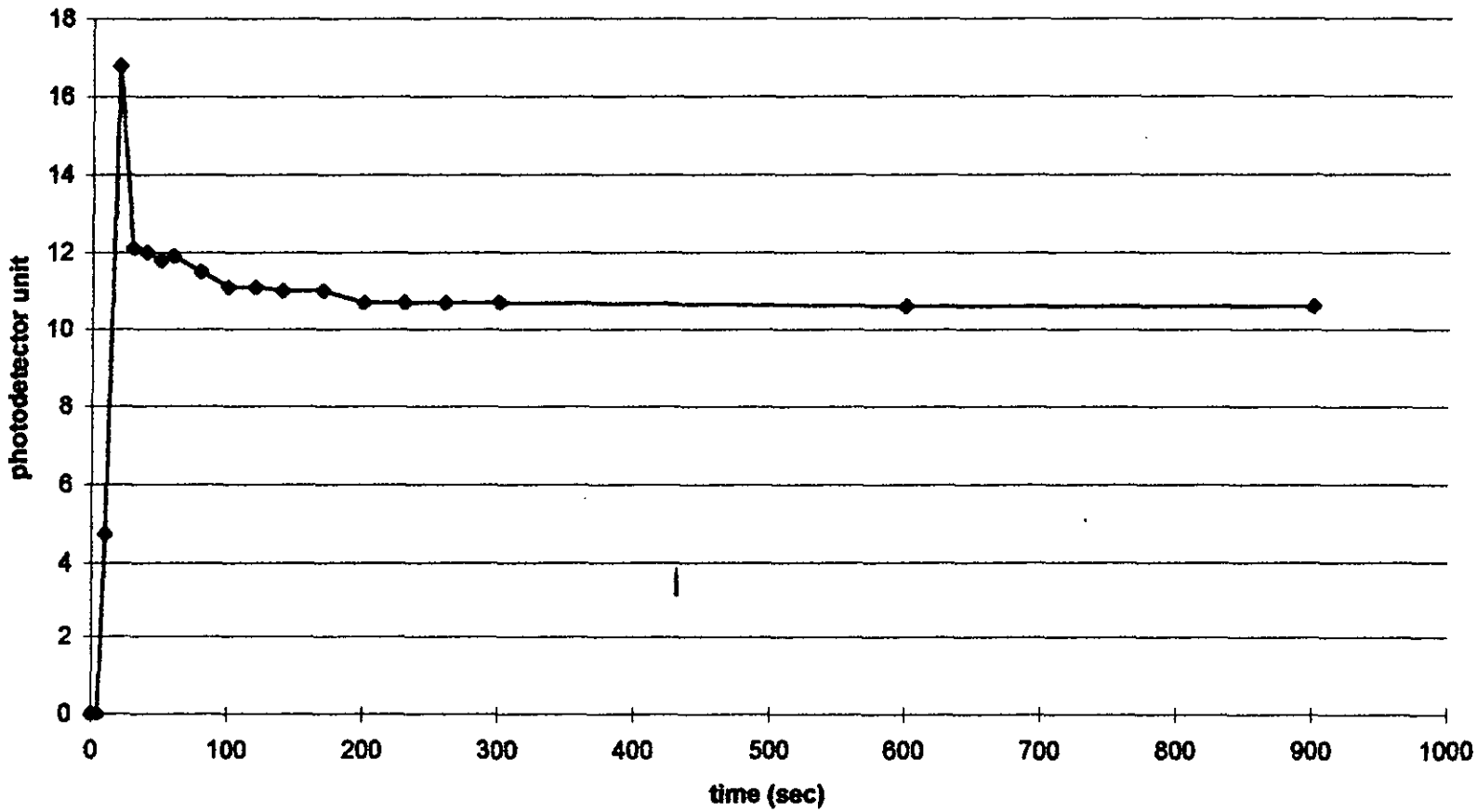
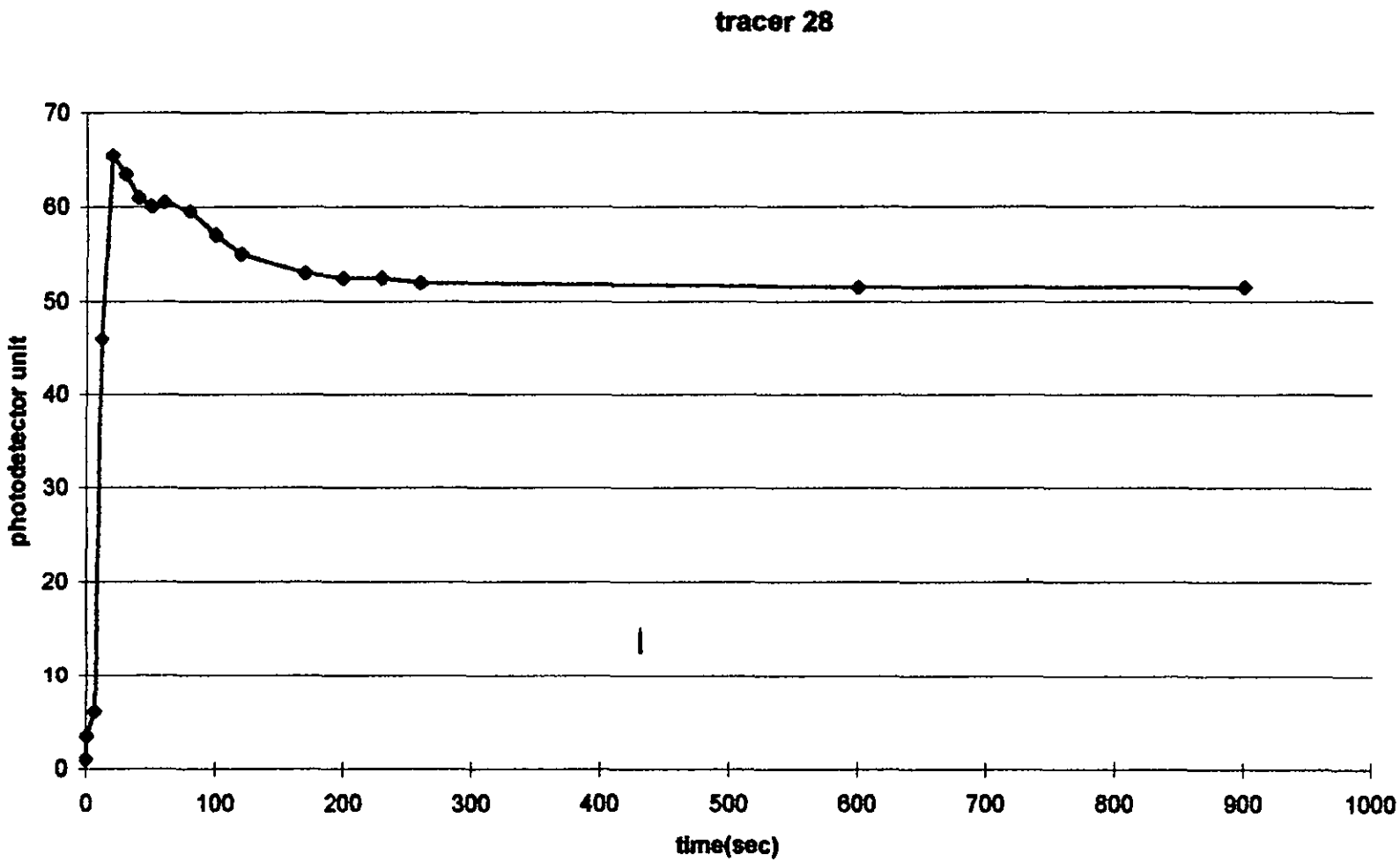
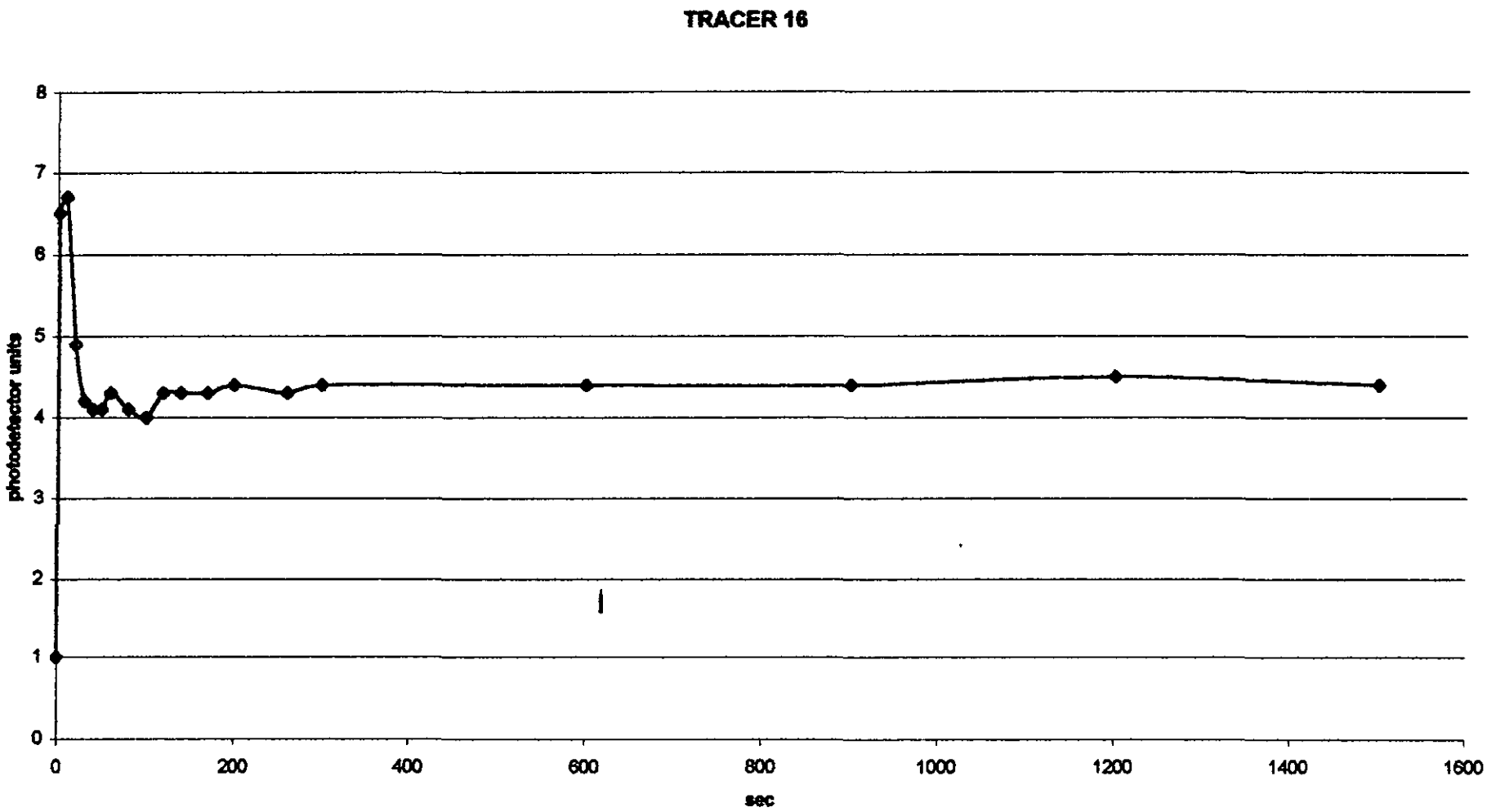


CHART 25


18
16
14
12
10
8
6
4
2
0
photodetector unit
0
100
200
300
400
500
600
700
800
900
1000
time (sec)


tracer 28
photodetector unit
70
60
50
40
30
20
10
0
0
100
200
300
400
500
600
700
800
900
1000
time(sec)


TRACER 16
photodetector units
0
1
2
3
4
5
6
7
8
0
200
400
600
800
1000
1200
1400
1600
sec

LITHIUM STANDARD 3

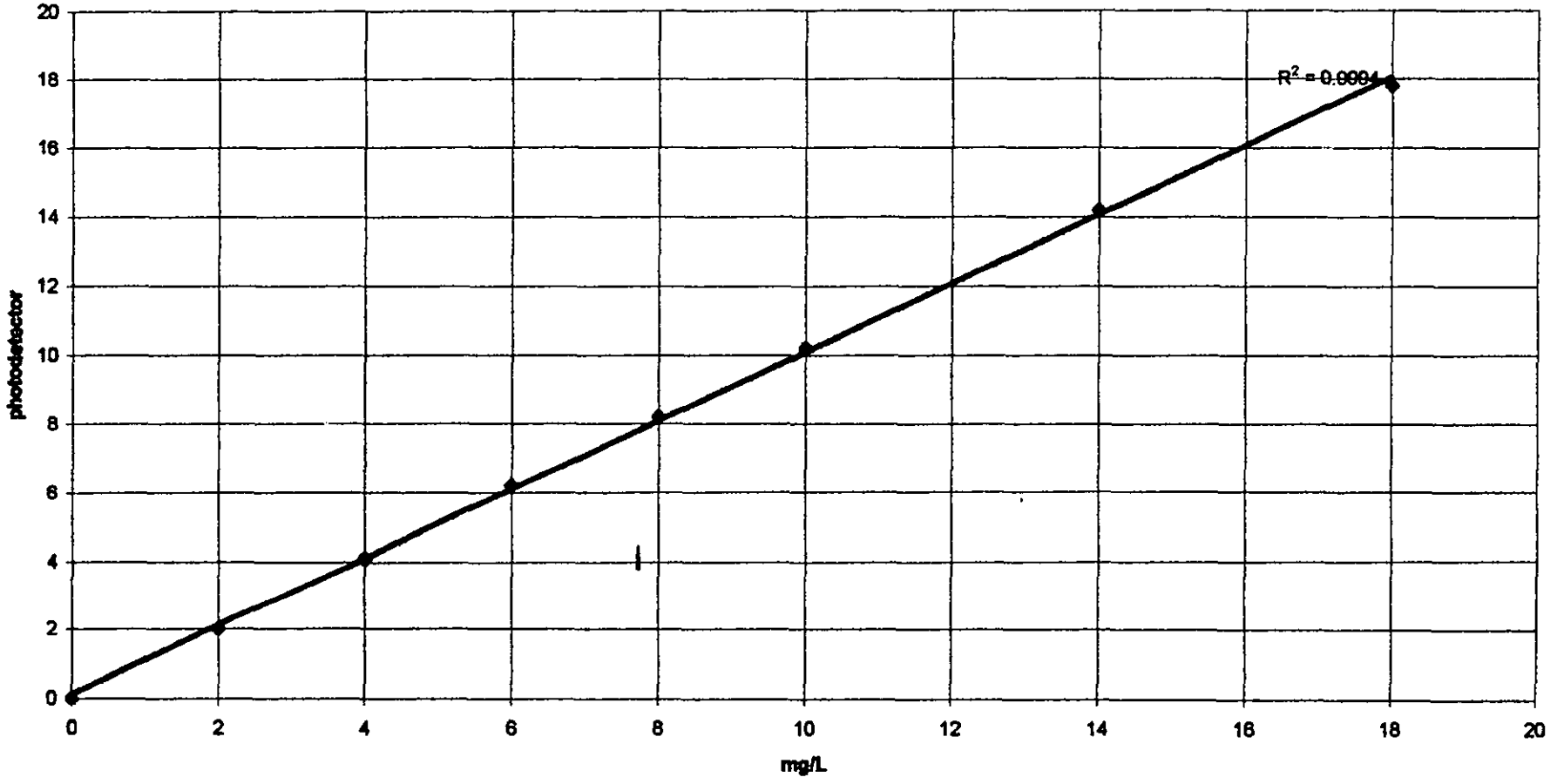
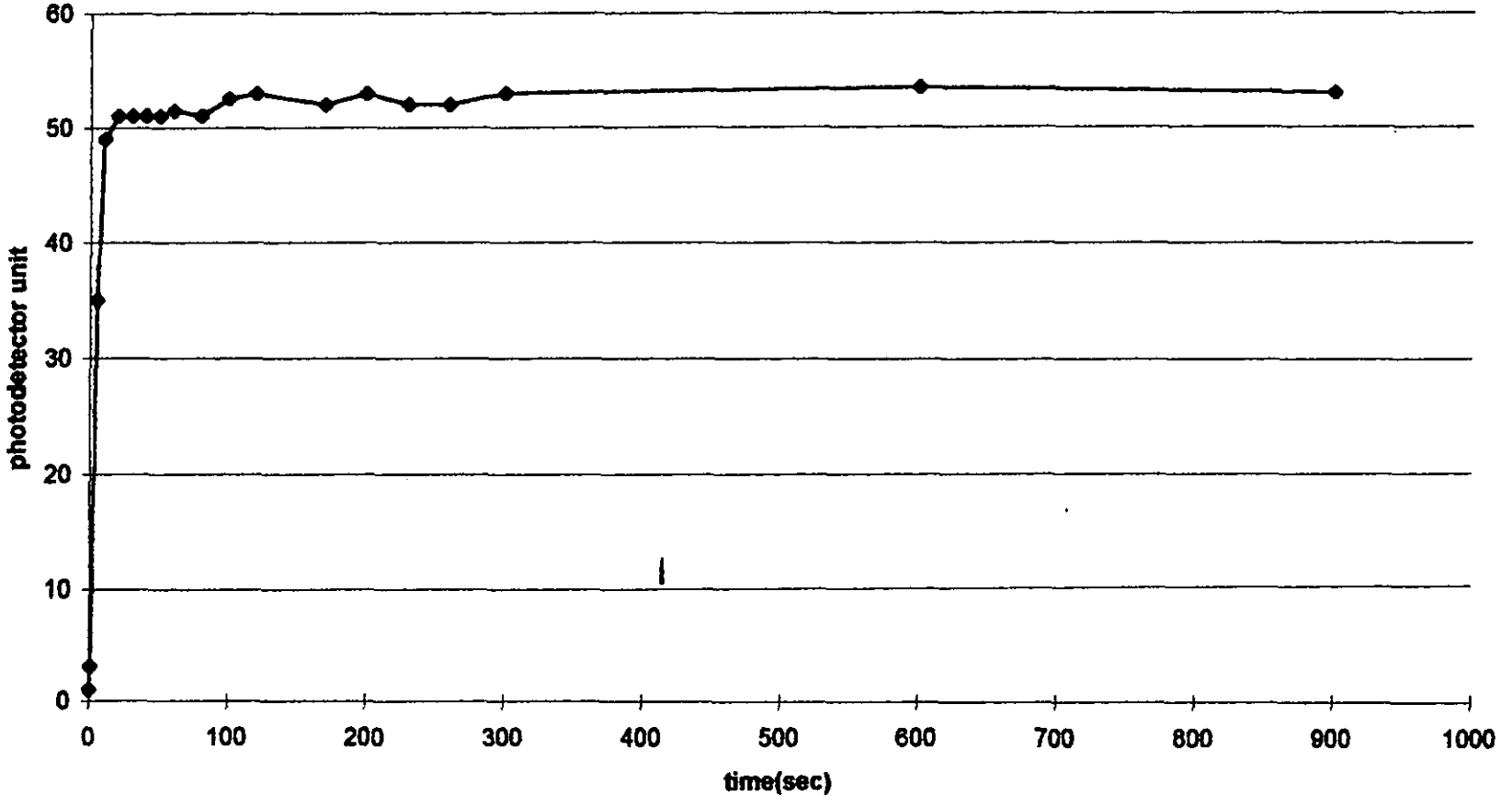


CHART 29


60
50
40
30
20
10
0
photodetector unit
0
100
200
300
400
500
600
700
800
900
1000
time(sec)

LITHIUM STANDARD 13

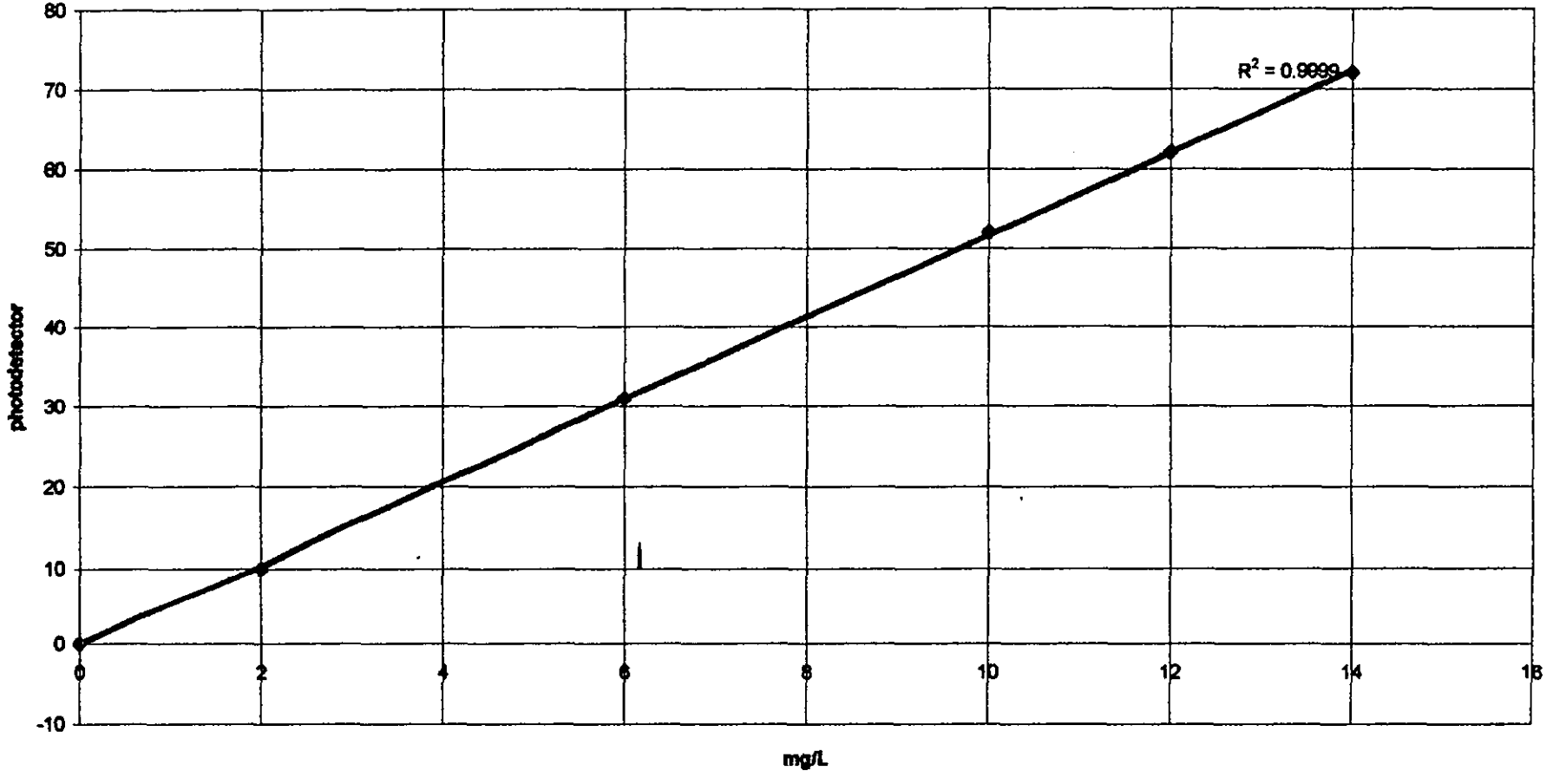
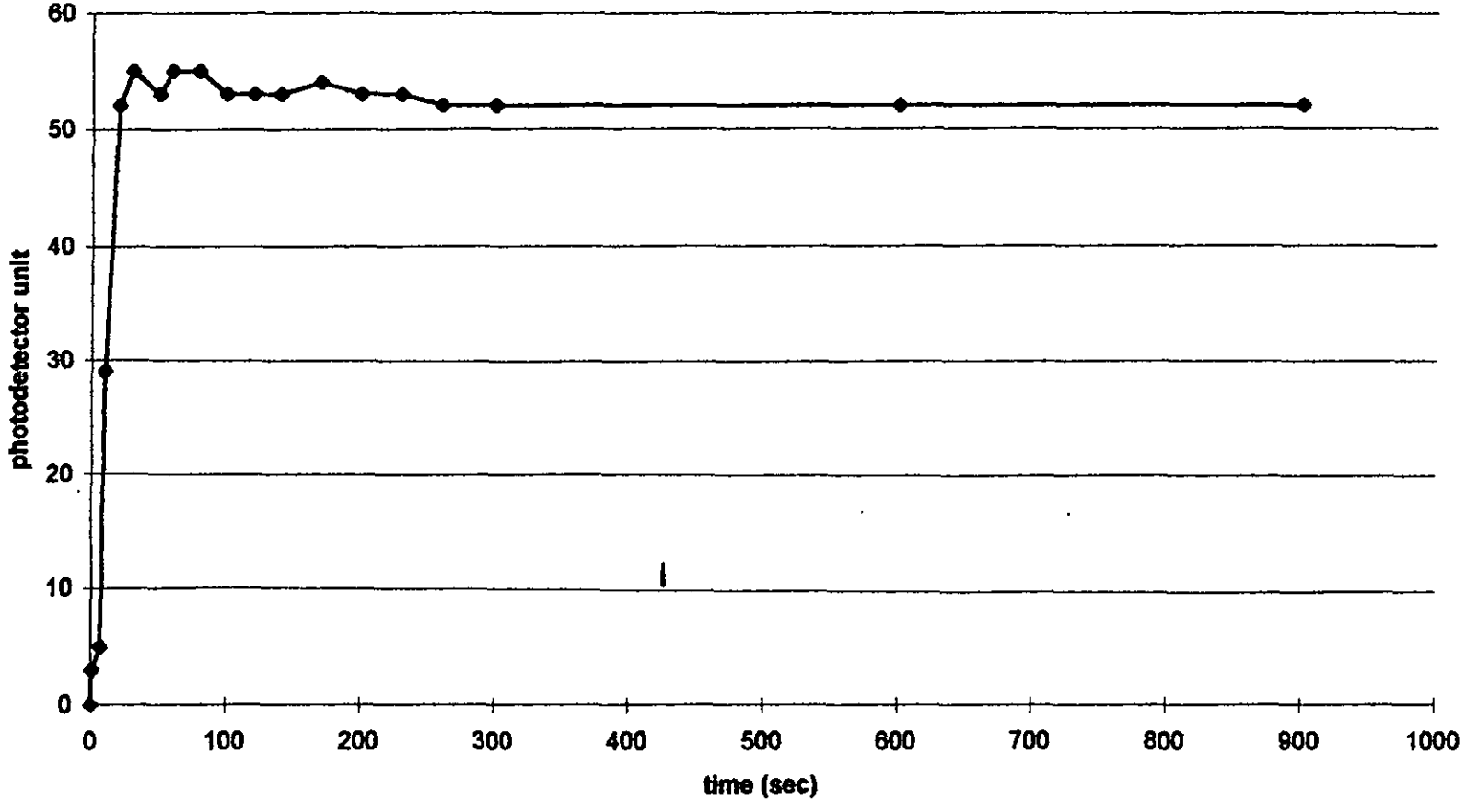


CHART 32


60
50
40
30
20
10
0
photodetector unit
0
100
200
300
400
500
600
700
800
900
1000
time (sec)

LITHIUM STANDARD 16

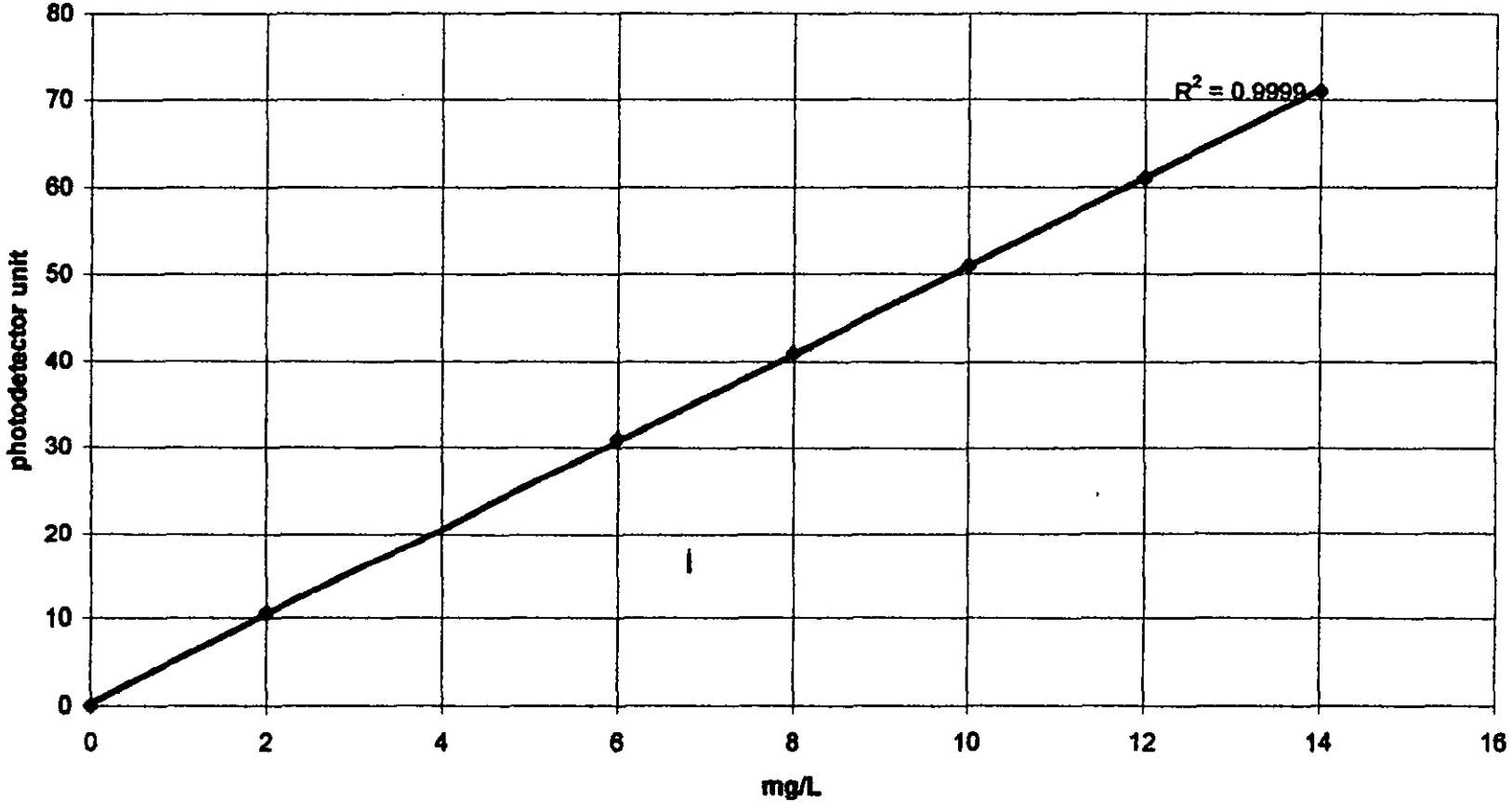
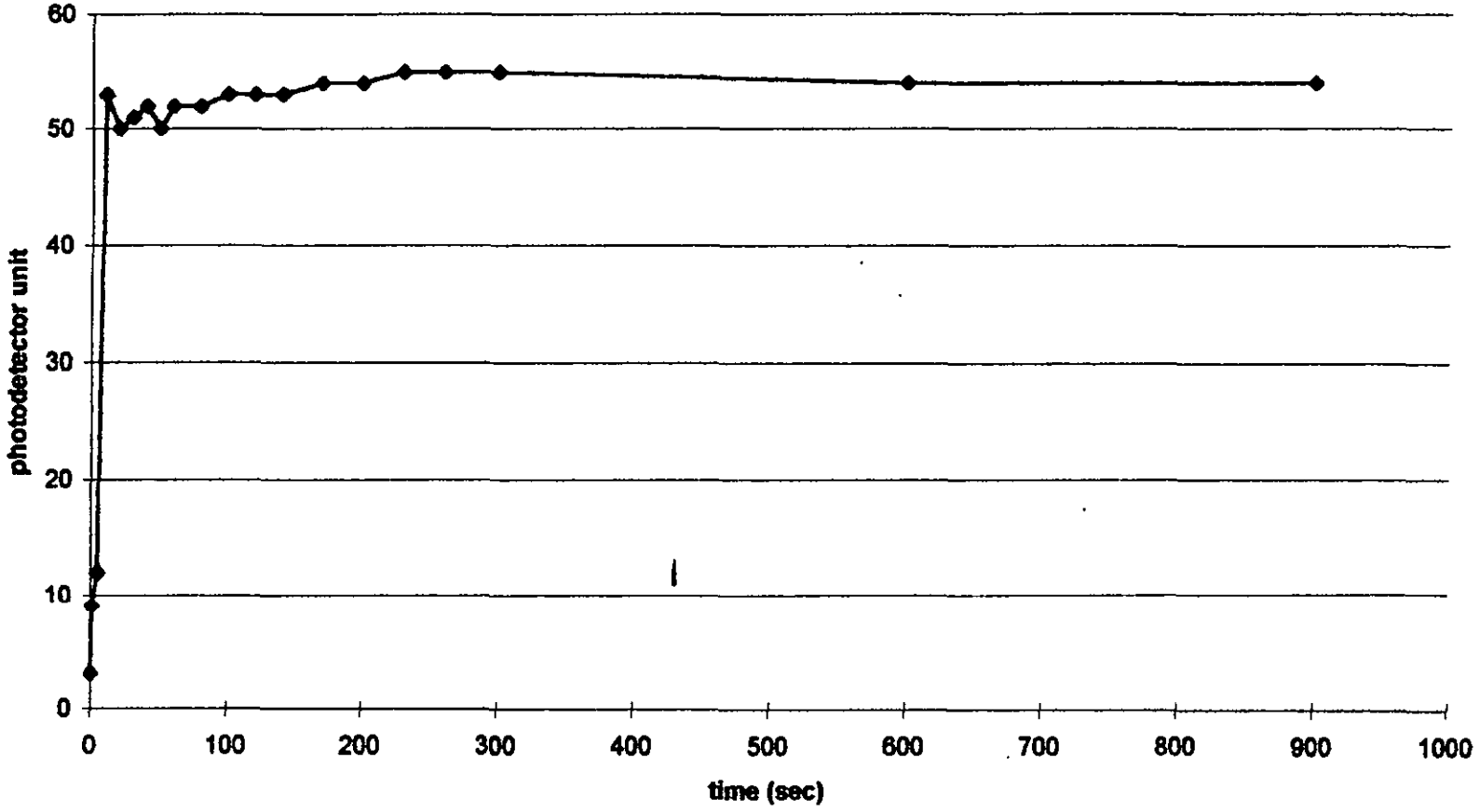
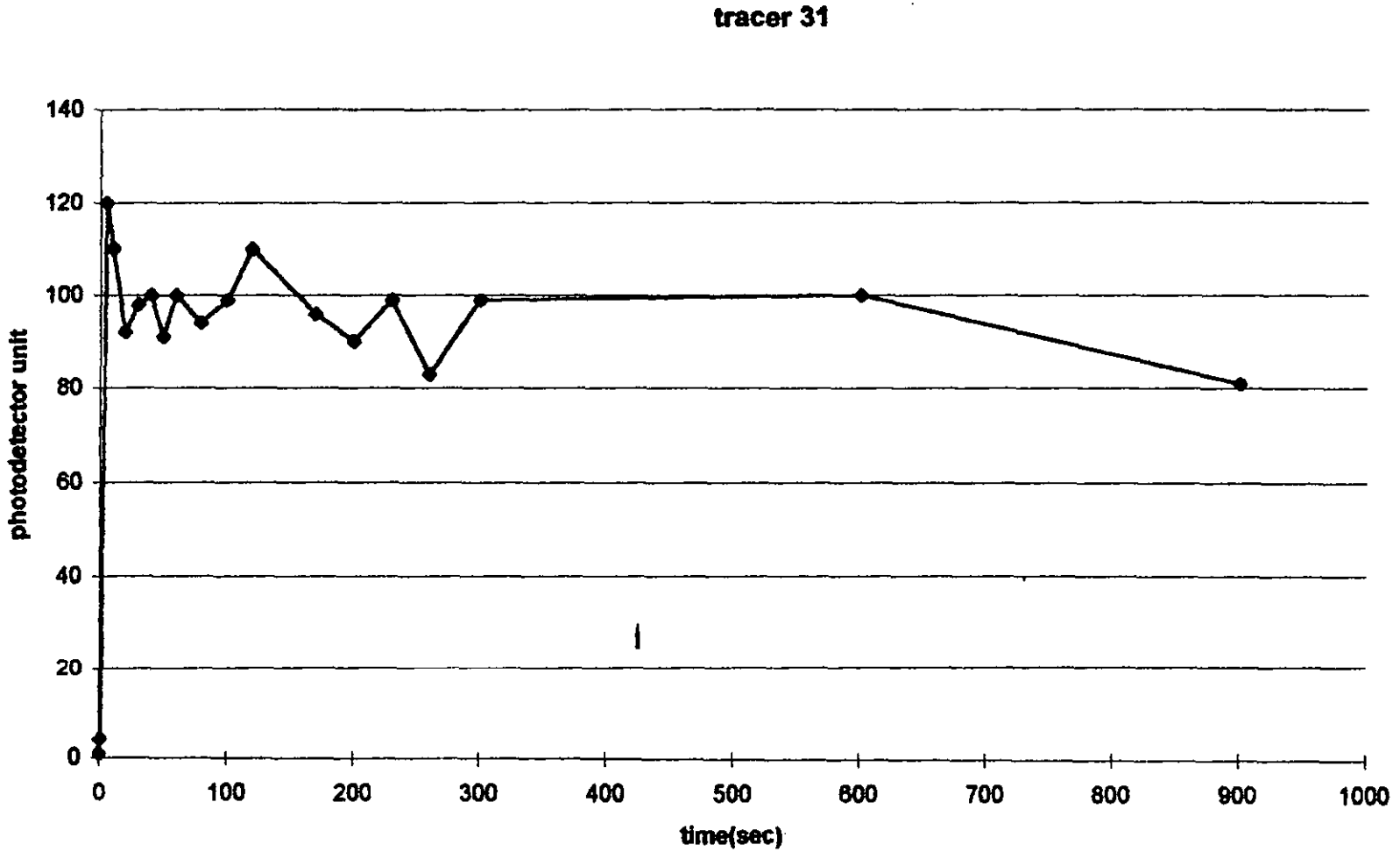
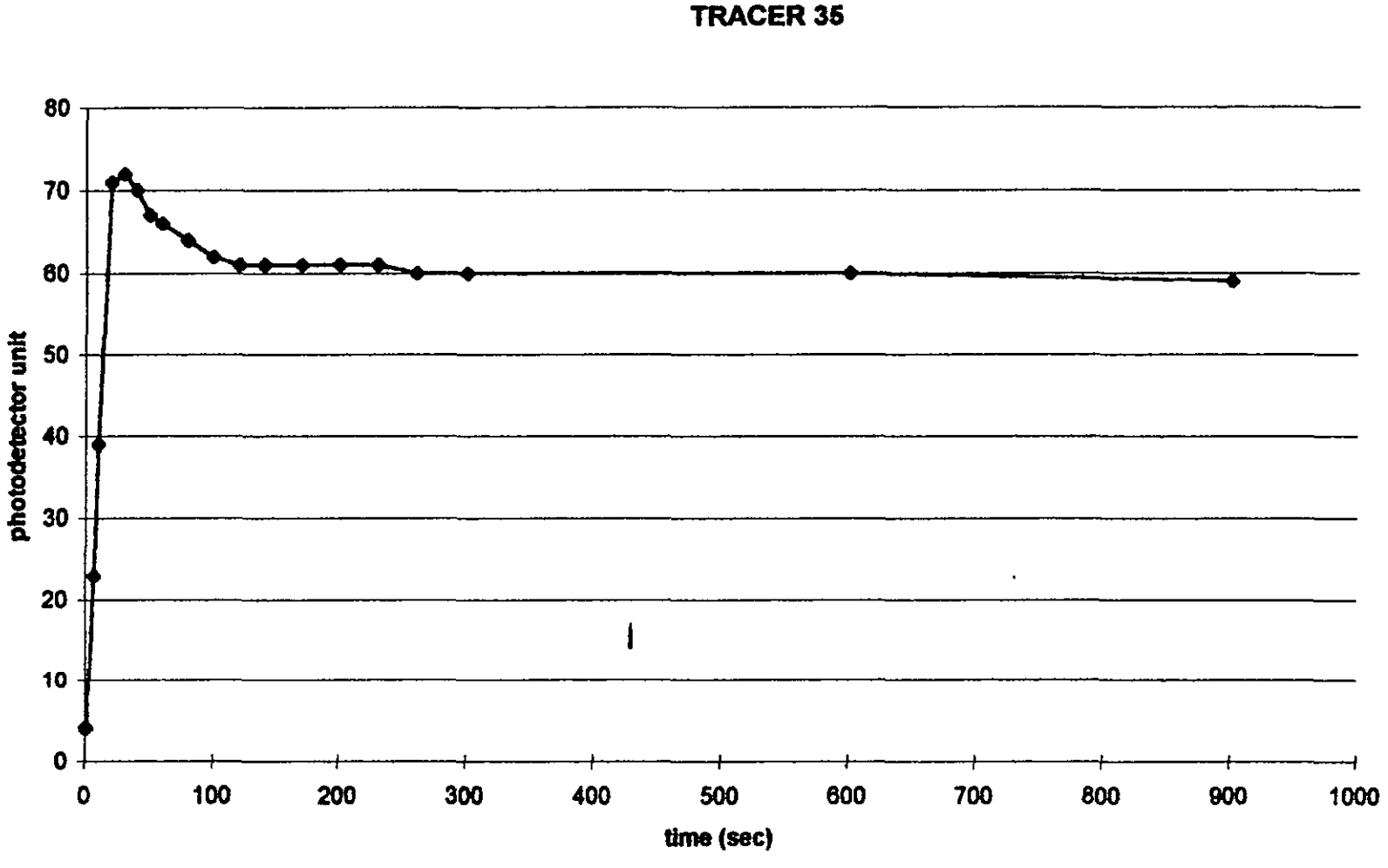


CHART 34


60
50
40
30
20
10
0
photodetector unit
0
100
200
300
400
500
600
700
800
900
1000
time (sec)


tracer 31
140
120
100
80
60
40
20
0
photodetector unit
0
100
200
300
400
500
600
700
800
900
1000
time(sec)


TRACER 35
photodetector unit
80
70
60
50
40
30
20
10
0
0
100
200
300
400
500
600
700
800
900
1000
time (sec)

LITHIUM STANDARD 15

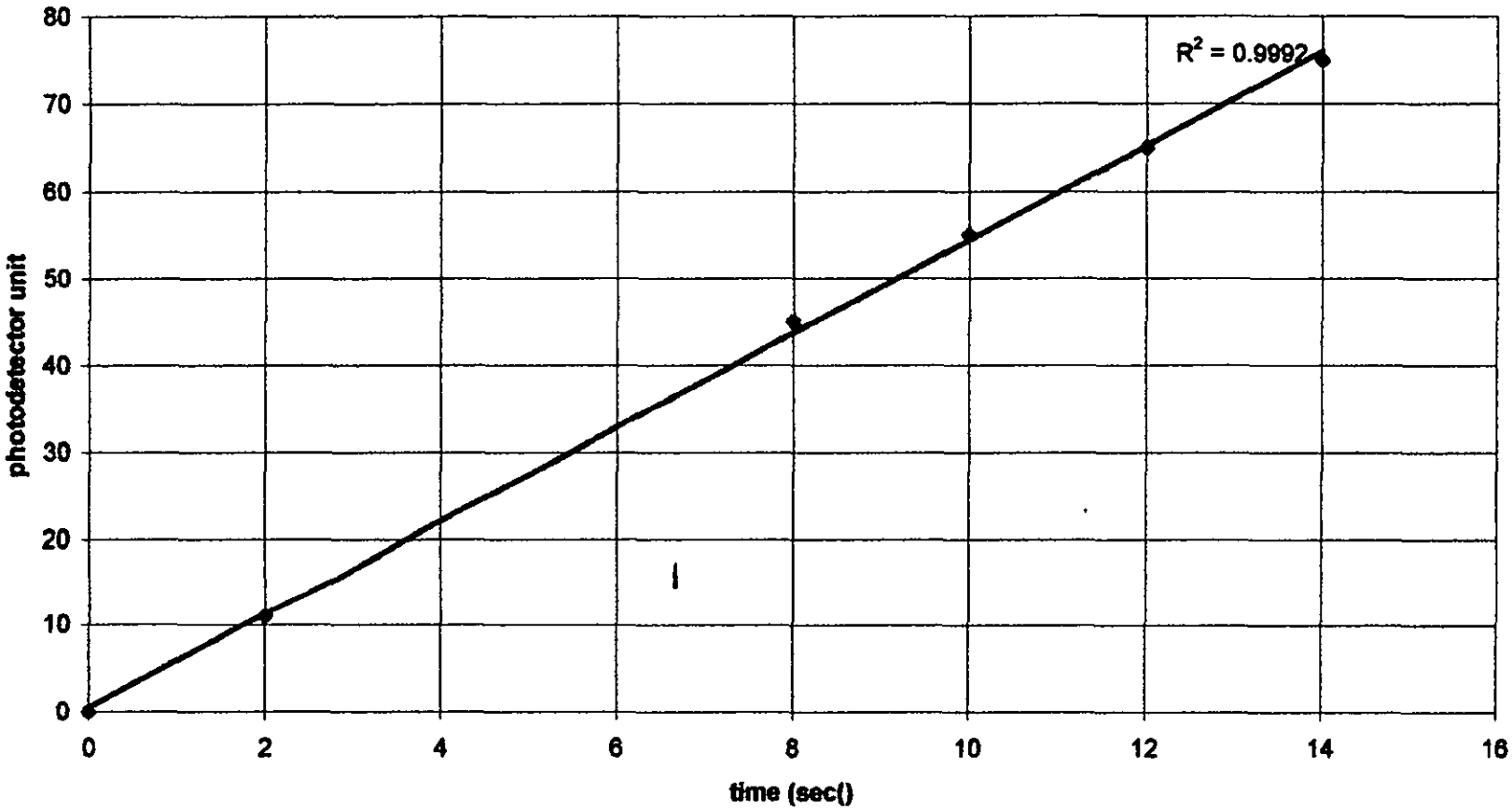
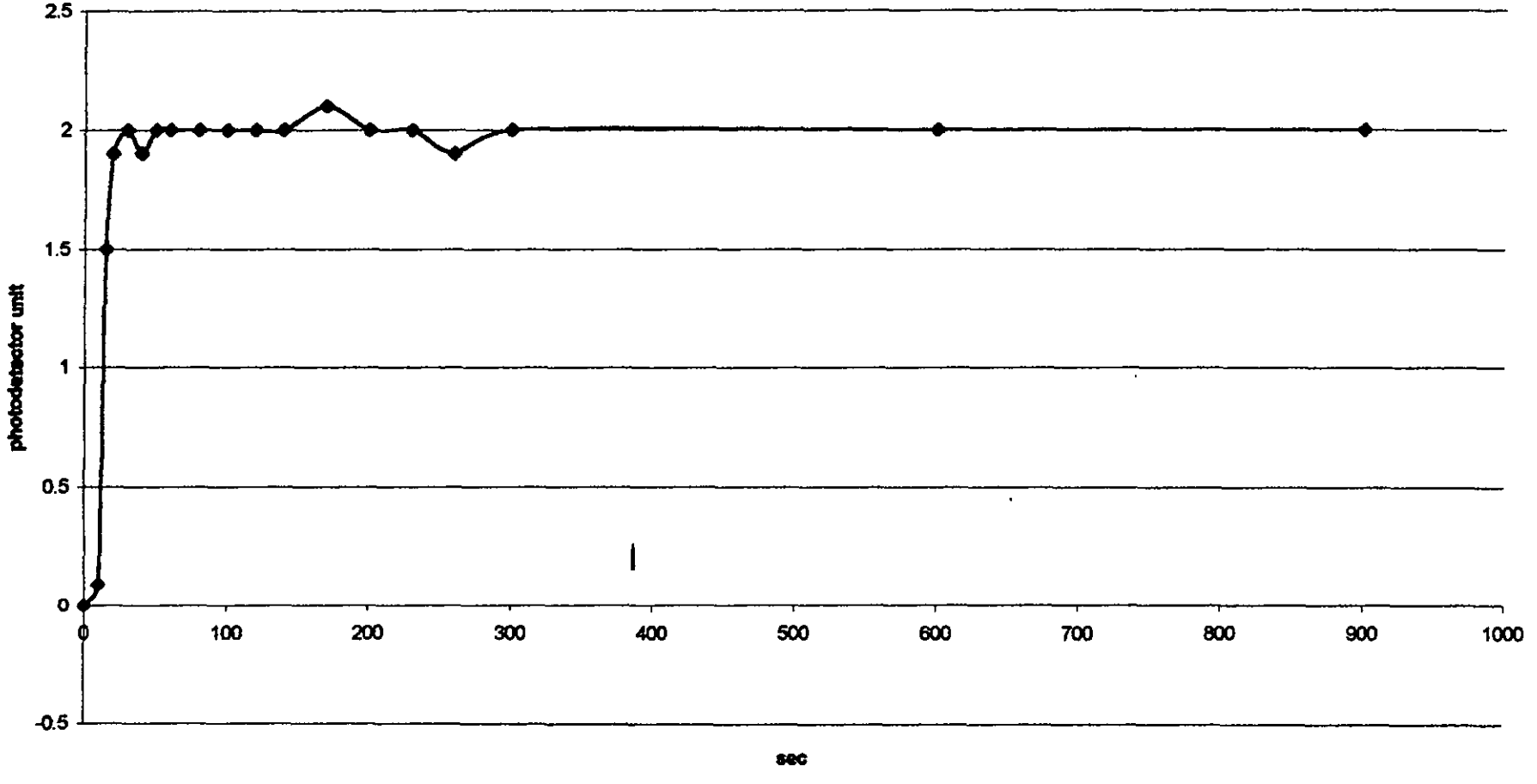


CHART 15


2.5
2
1.5
1
0.5
0
-0.5
photodetector unit
0
100
200
300
400
500
600
700
800
900
1000
sec

LITHIUM STANDARD 2

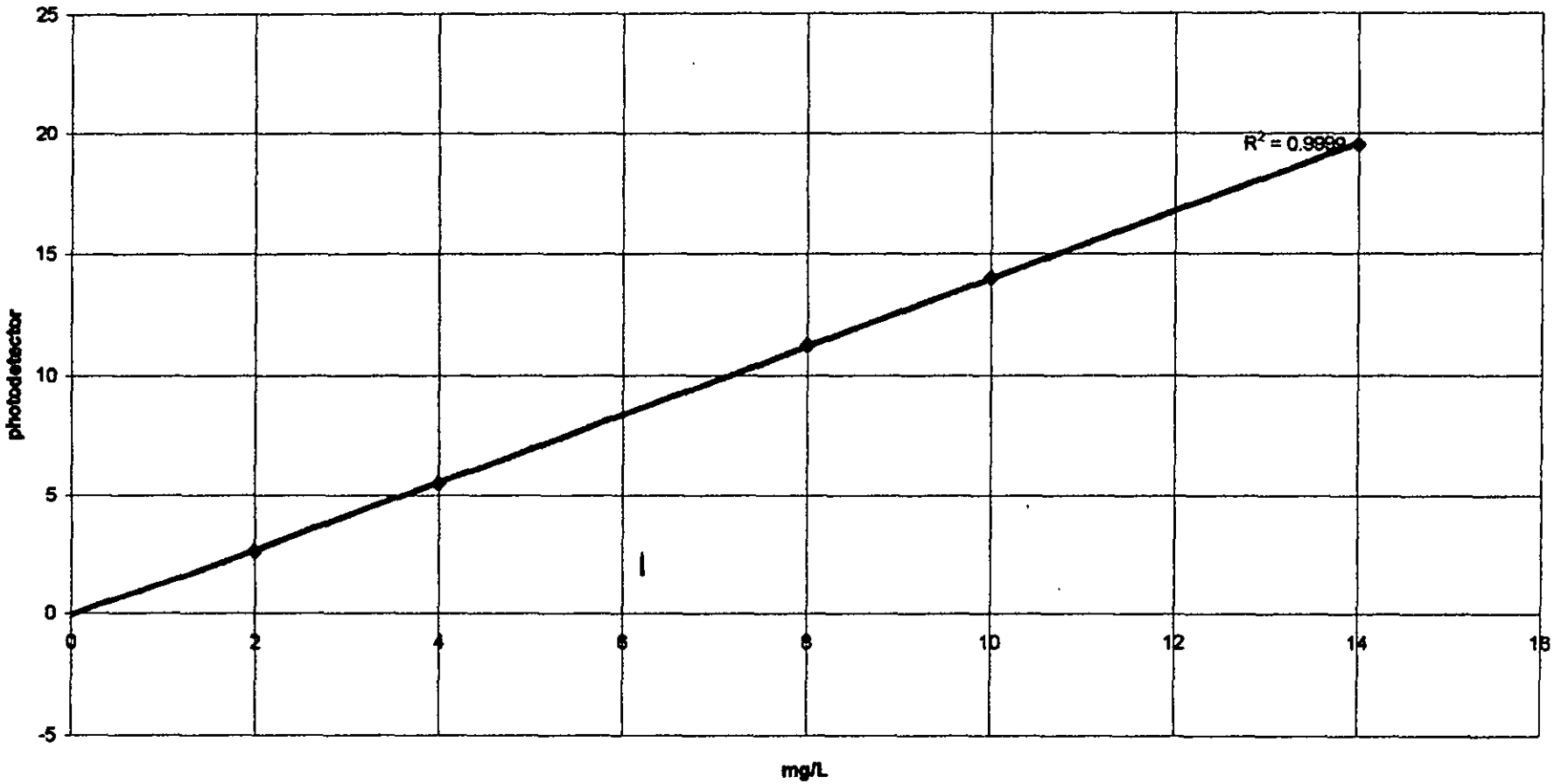


CHART 33

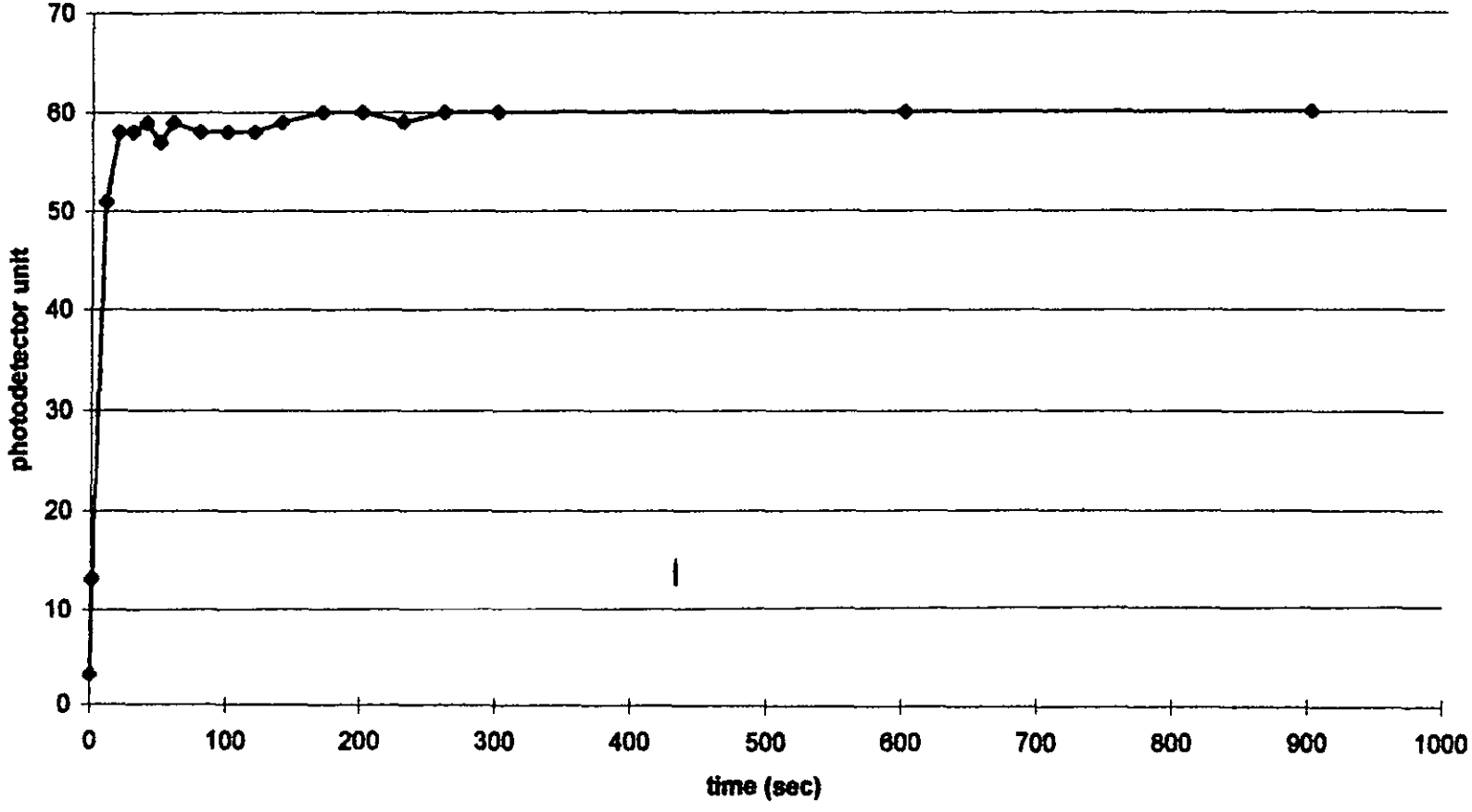

70
60
50
40
30
20
10
0
photodetector unit
0
100
200
300
400
500
600
700
800
900
1000
time (sec)

CHART 36

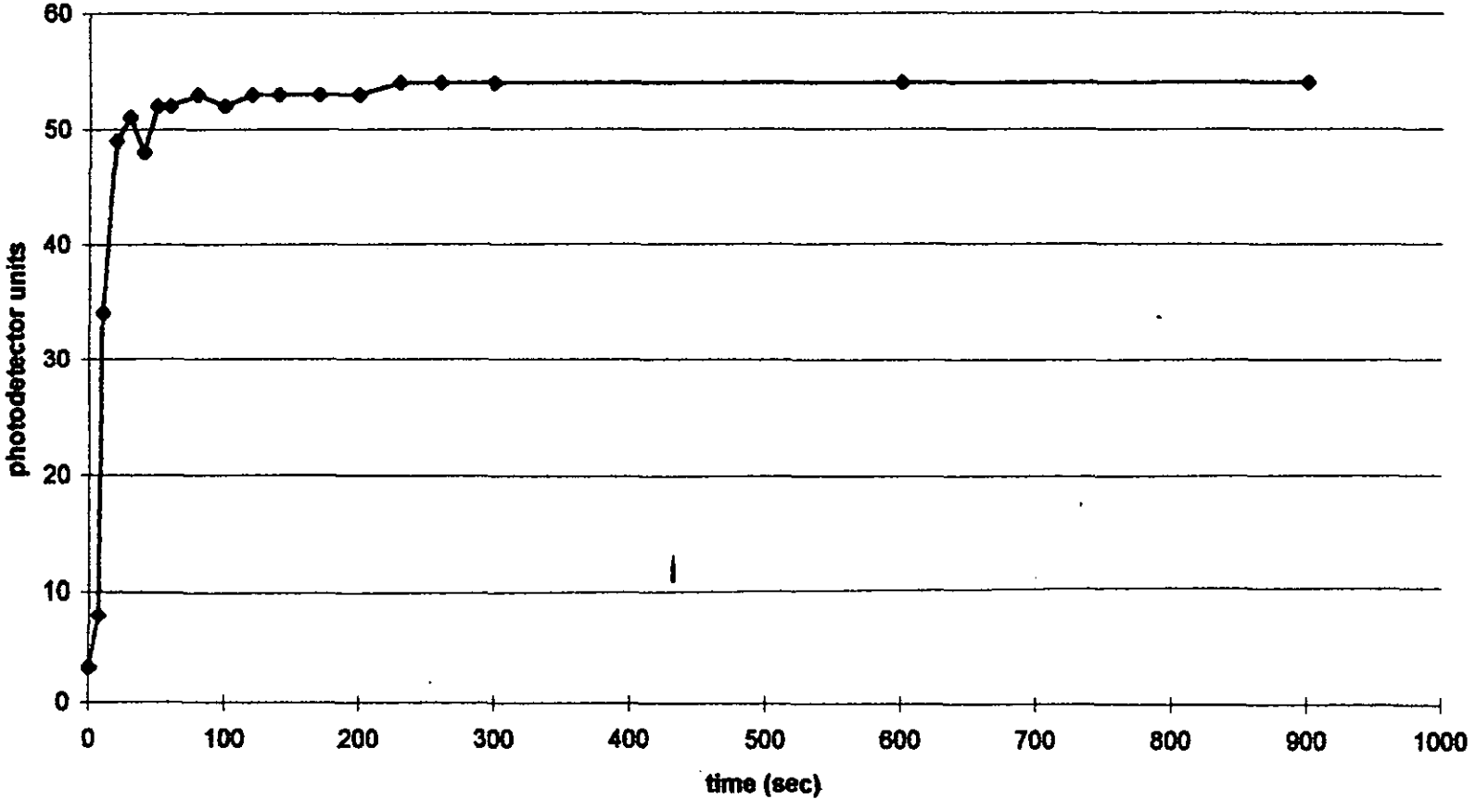
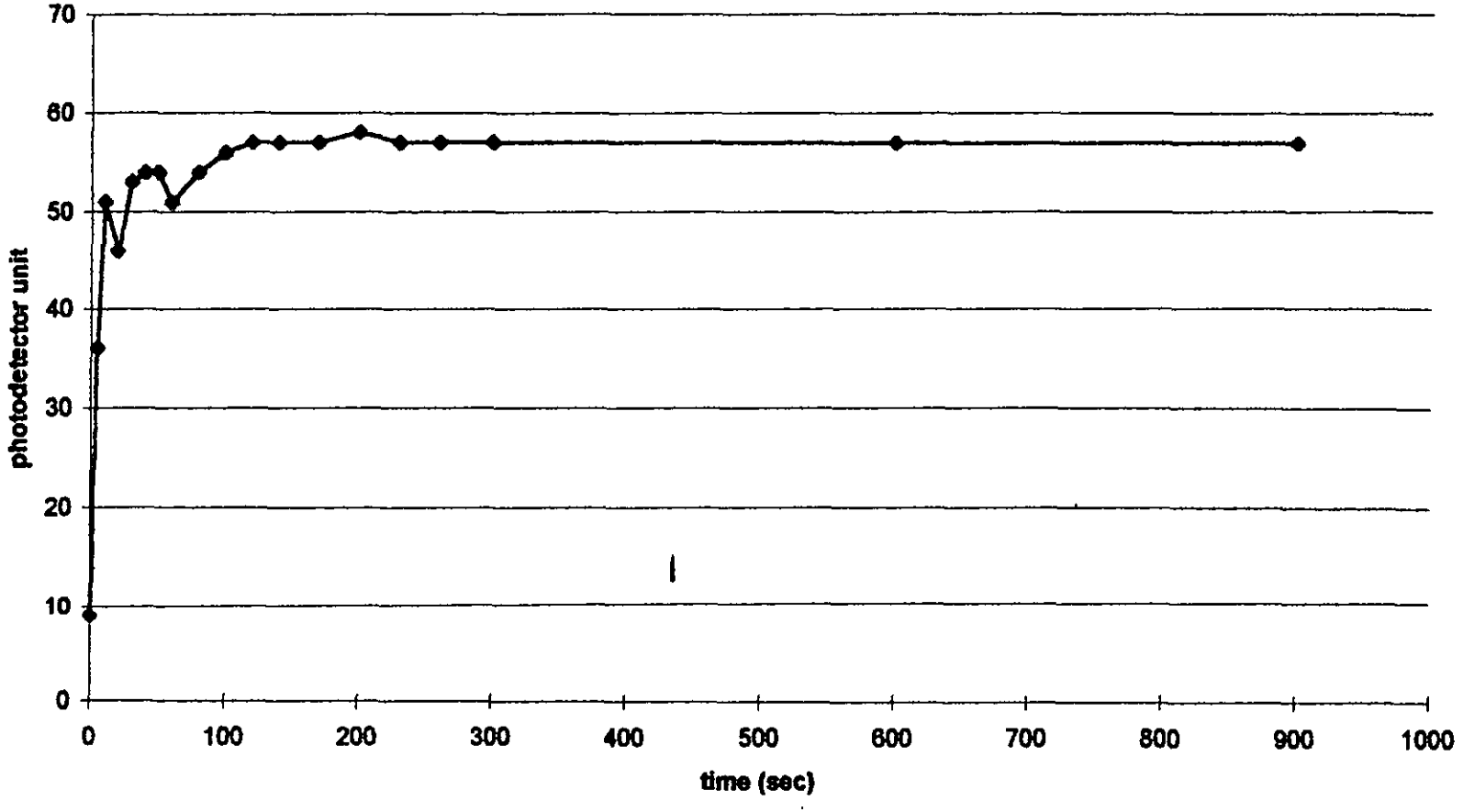

60
50
40
30
20
10
0
photodetector units
0
100
200
300
400
500
600
700
800
900
1000
time (sec)

CHART 41


70
60
50
40
30
20
10
0
photodetector unit
0
100
200
300
400
500
600
700
800
900
1000
time (sec)

LITHIUM STANDARD 19

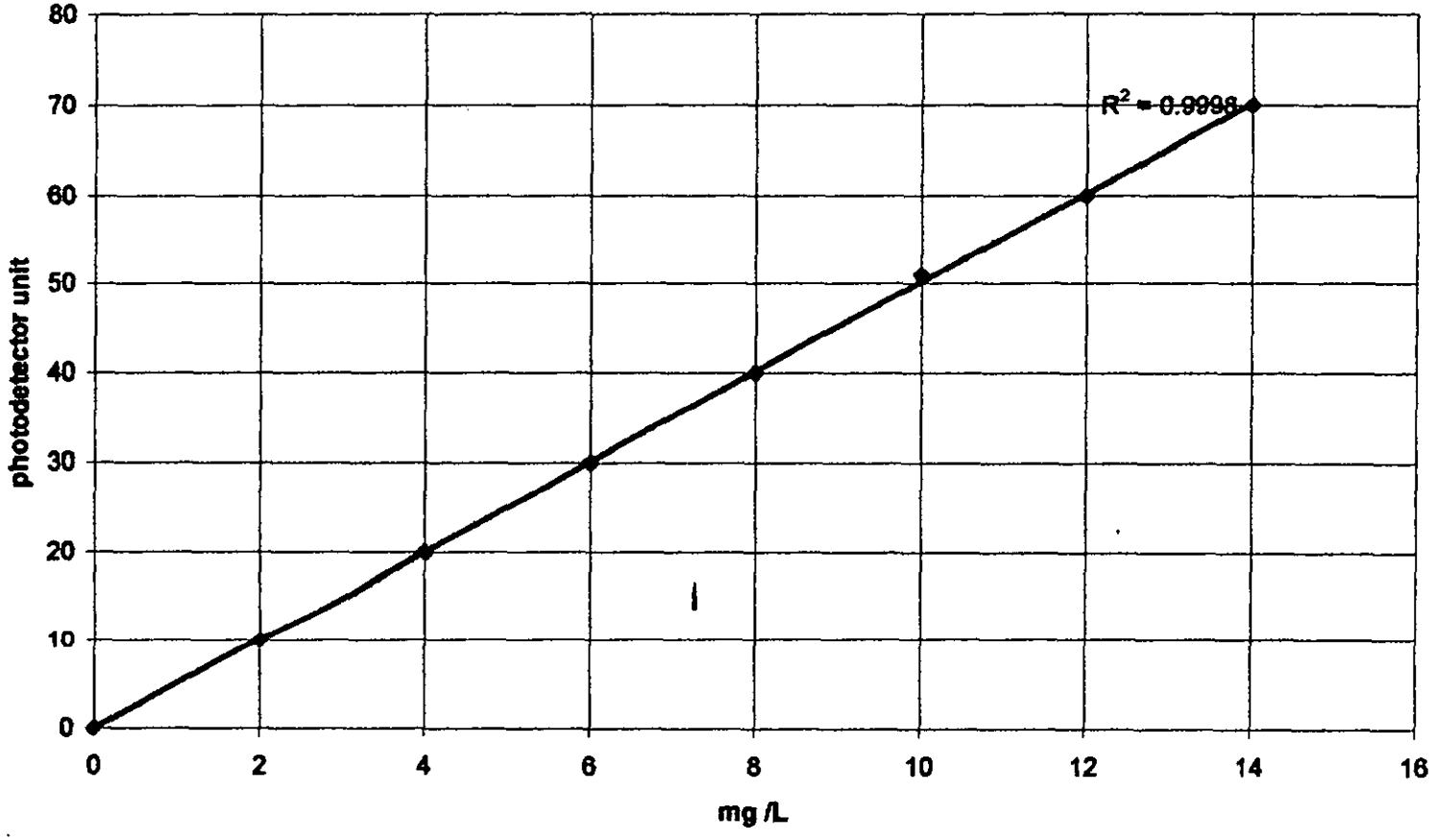


CHART 42

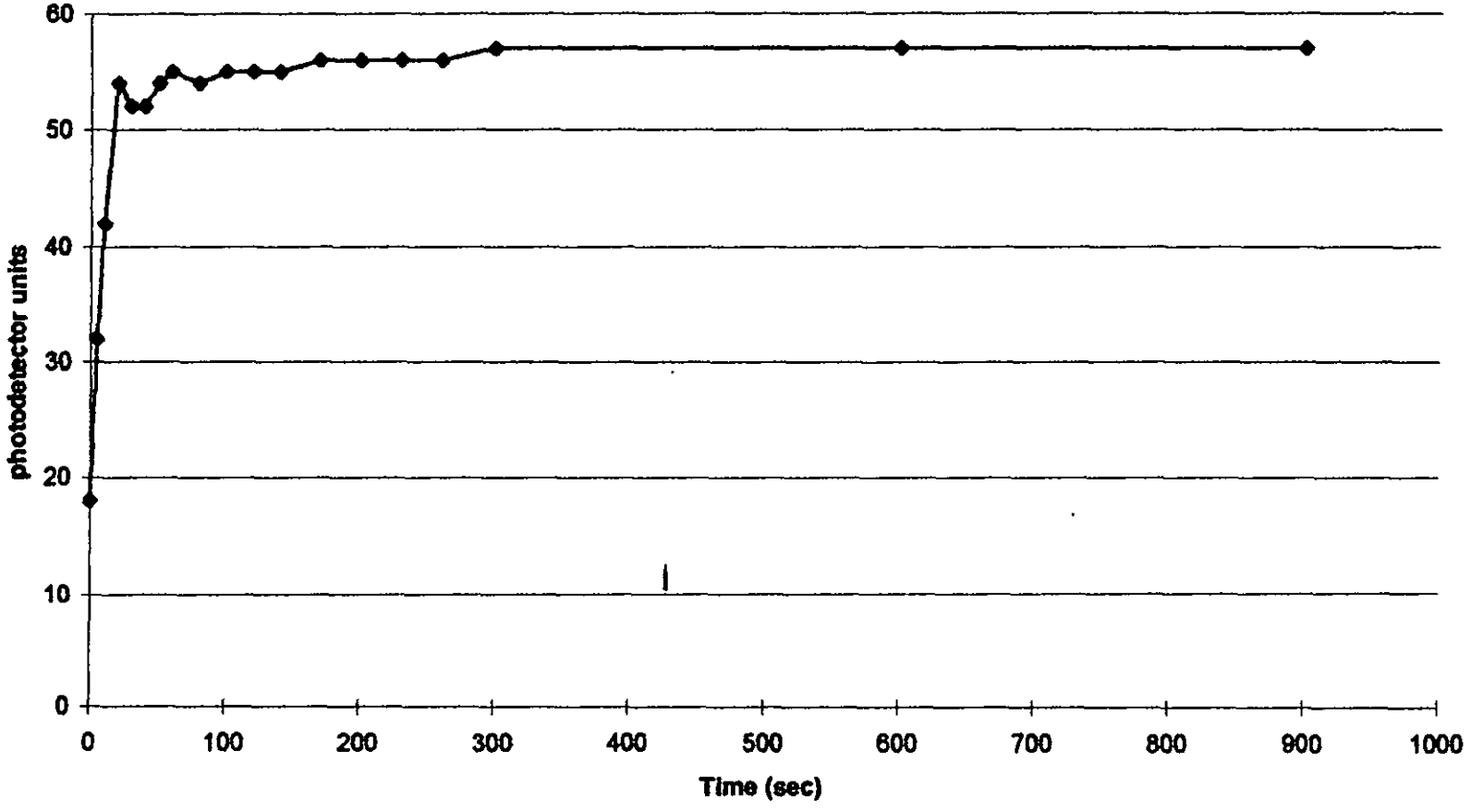
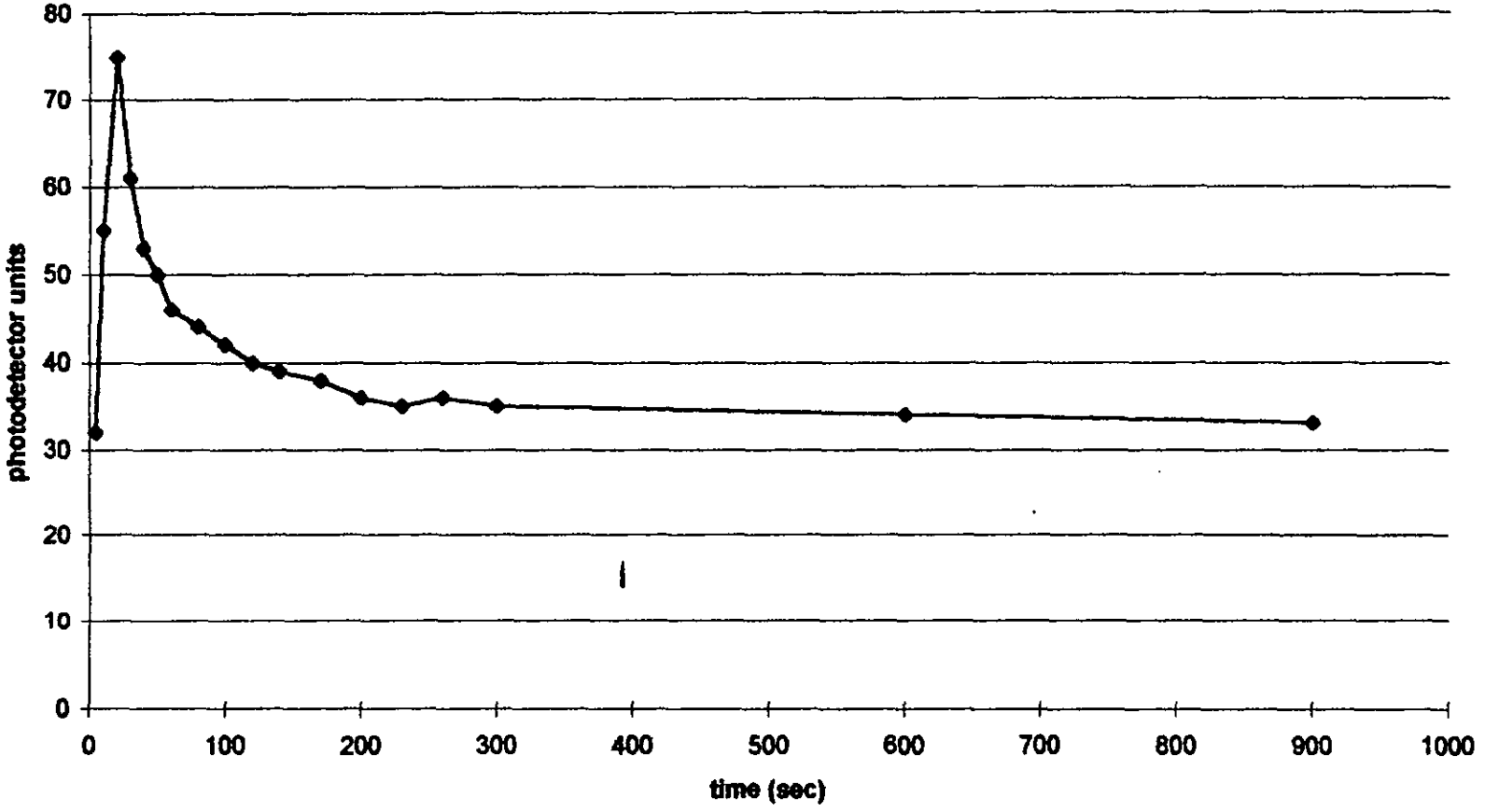

60
50
40
30
20
10
0
photodetector units
0
100
200
300
400
500
600
700
800
900
1000
Time (sec)

CHART 39


80
70
60
50
40
30
20
10
0
photodetector units
0
100
200
300
400
500
600
700
800
900
1000
time (sec)

LITHIUM STANDARD 18 (A)

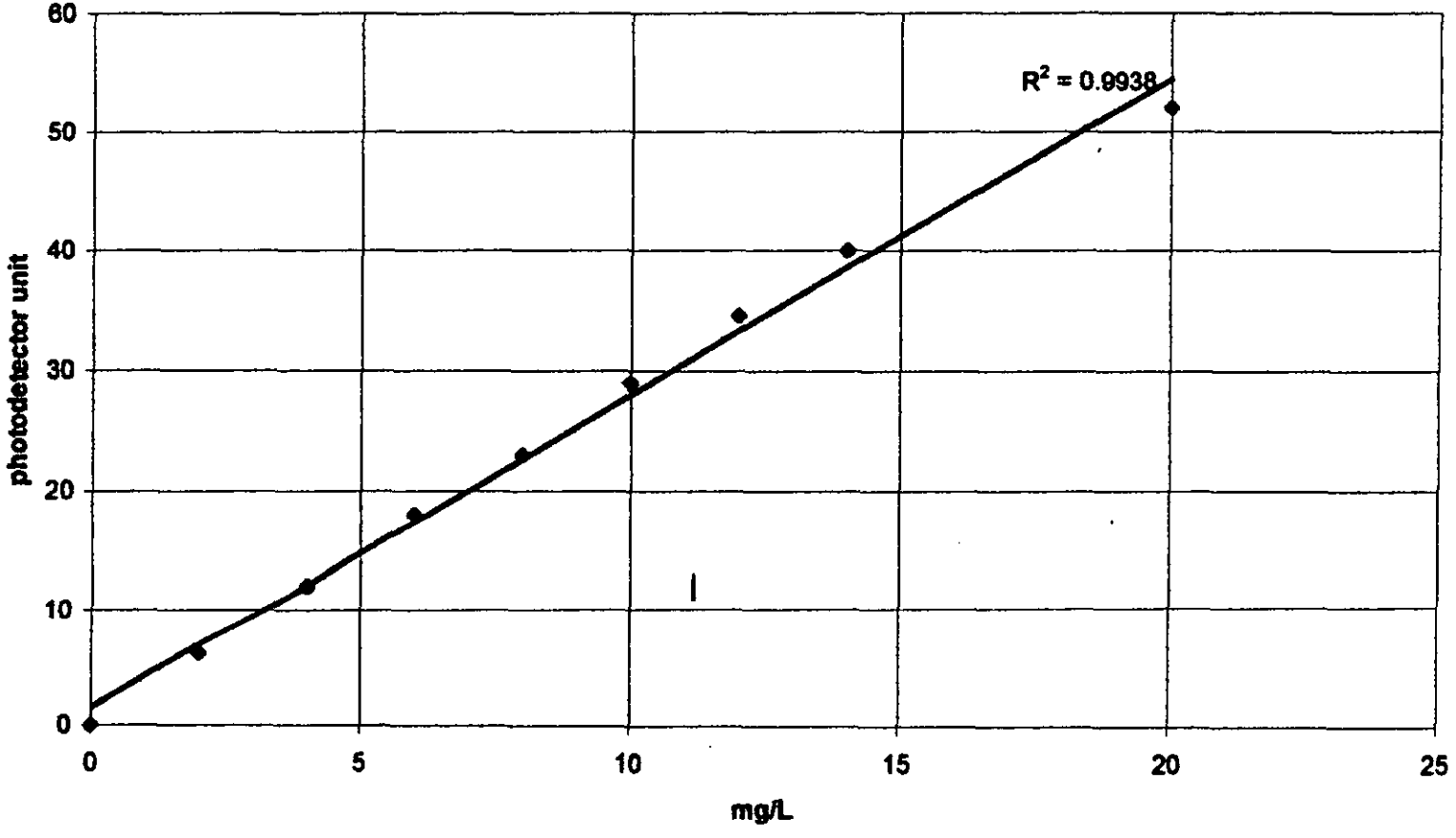
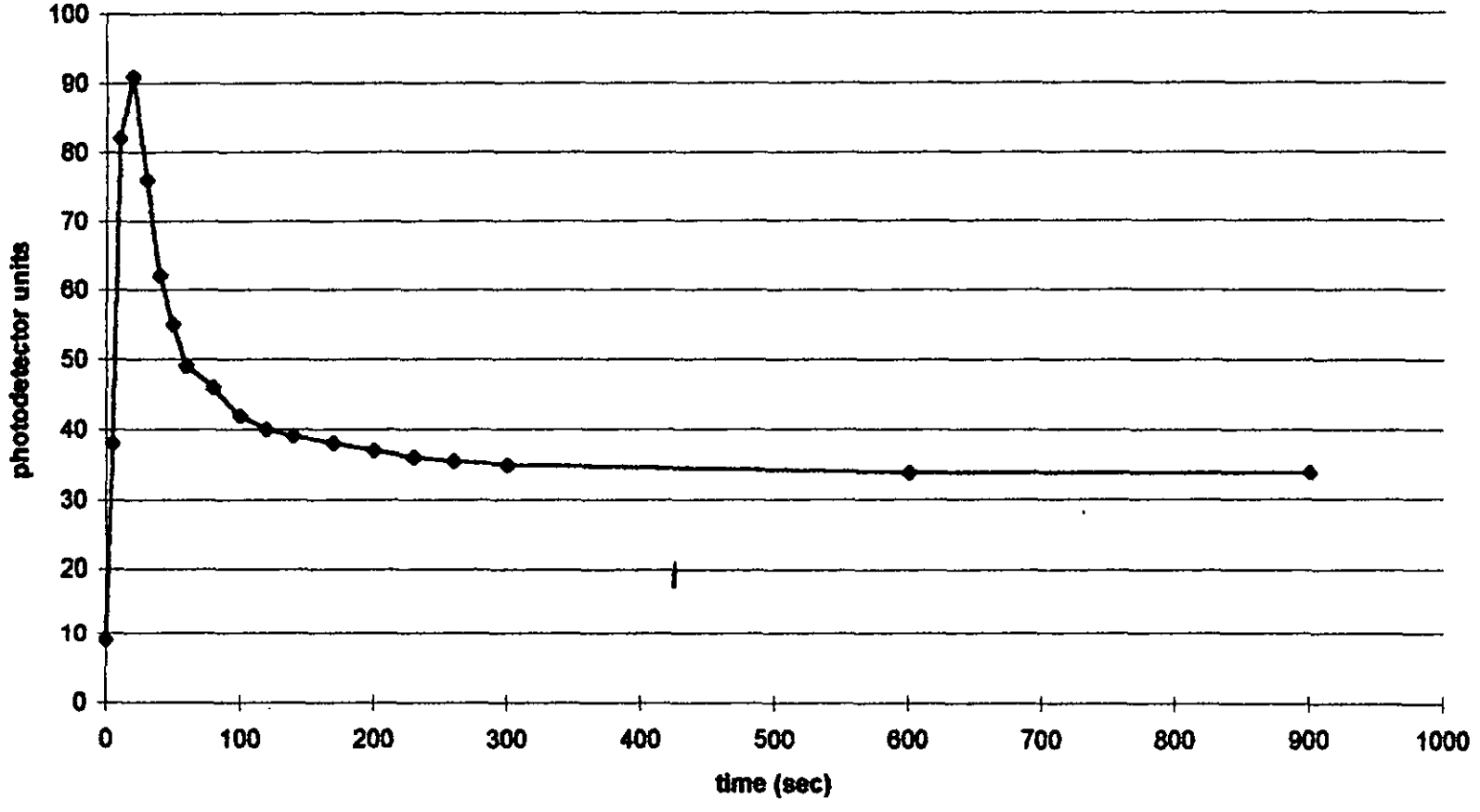


CHART 40


100
90
80
70
60
50
40
30
20
10
0
photodetector units
0
100
200
300
400
500
600
700
800
900
1000
time (sec)

LITHIUM STANDARD 18(B)

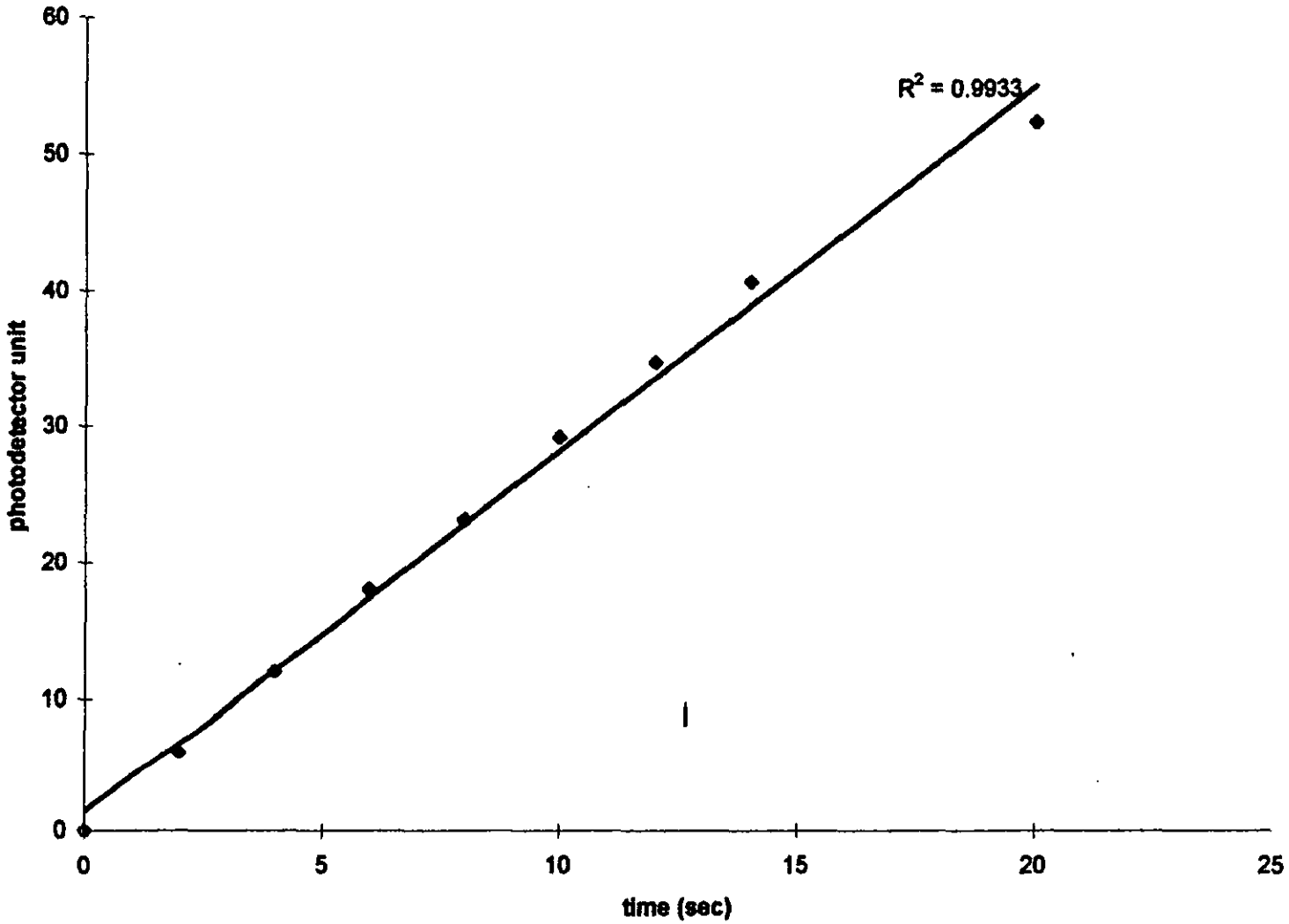
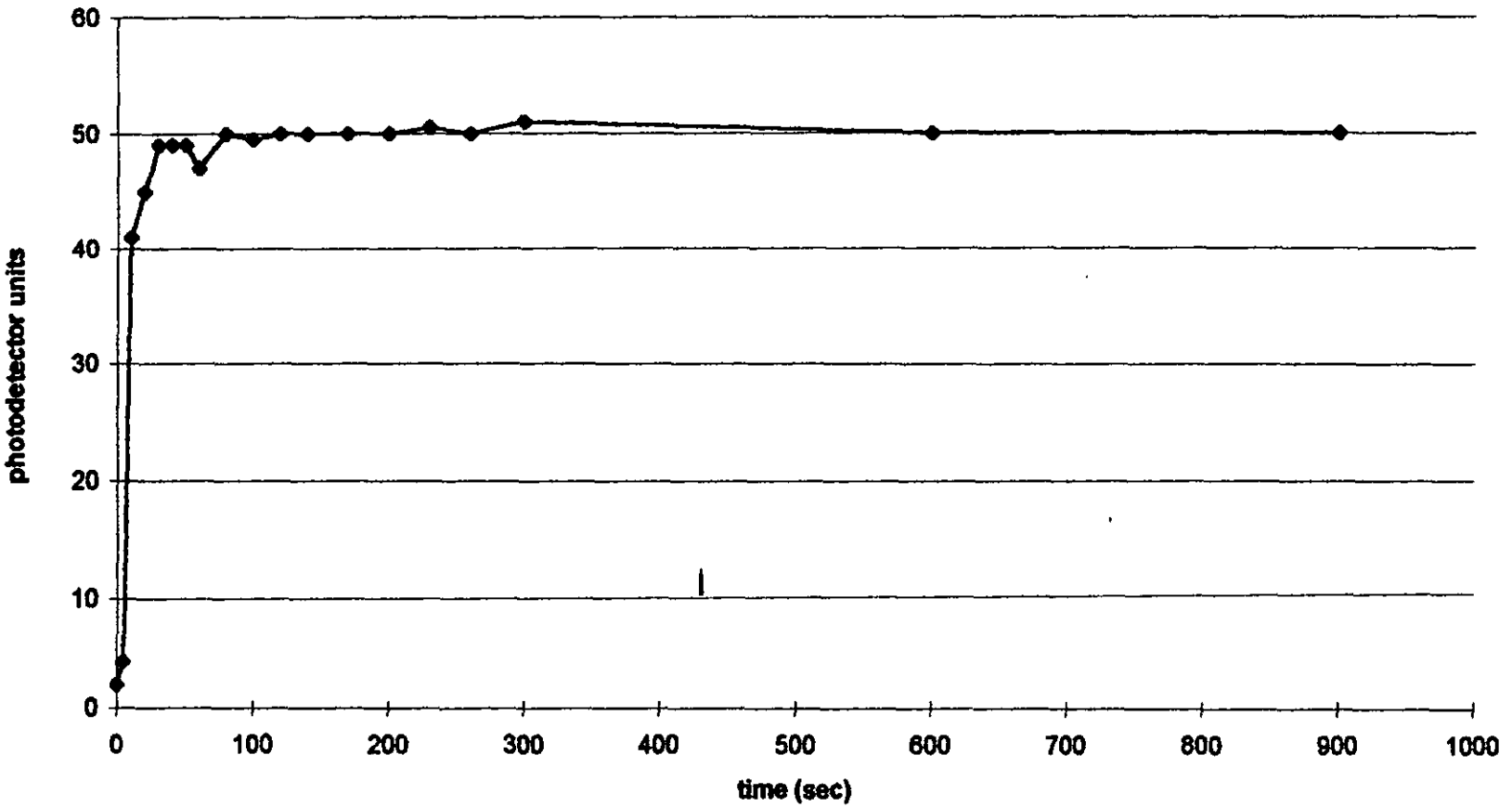


CHART 37


60
50
40
30
20
10
0
photodetector units
0
100
200
300
400
500
600
700
800
900
1000
time (sec)

LITHIUM STANDARD 17 A

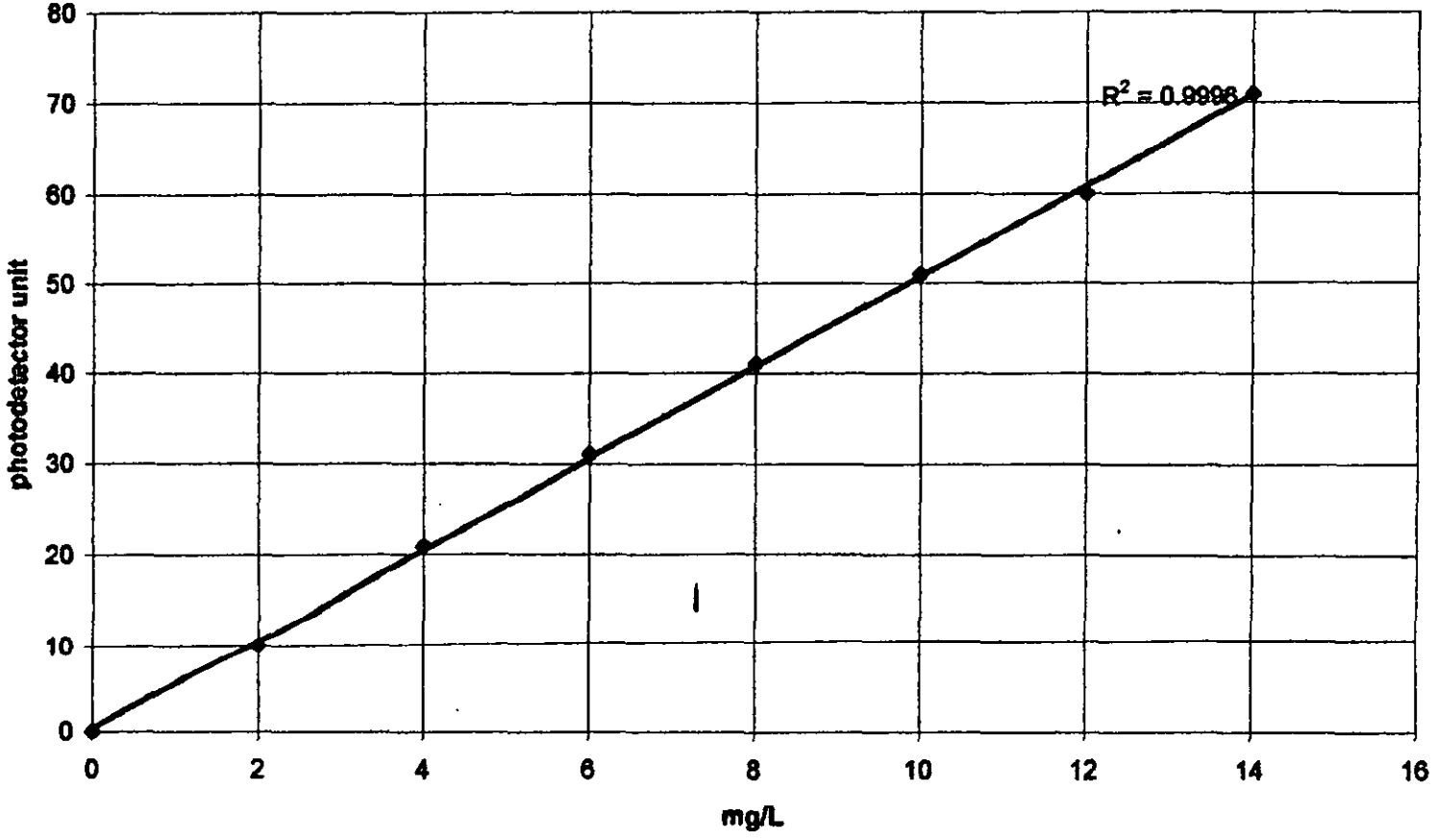
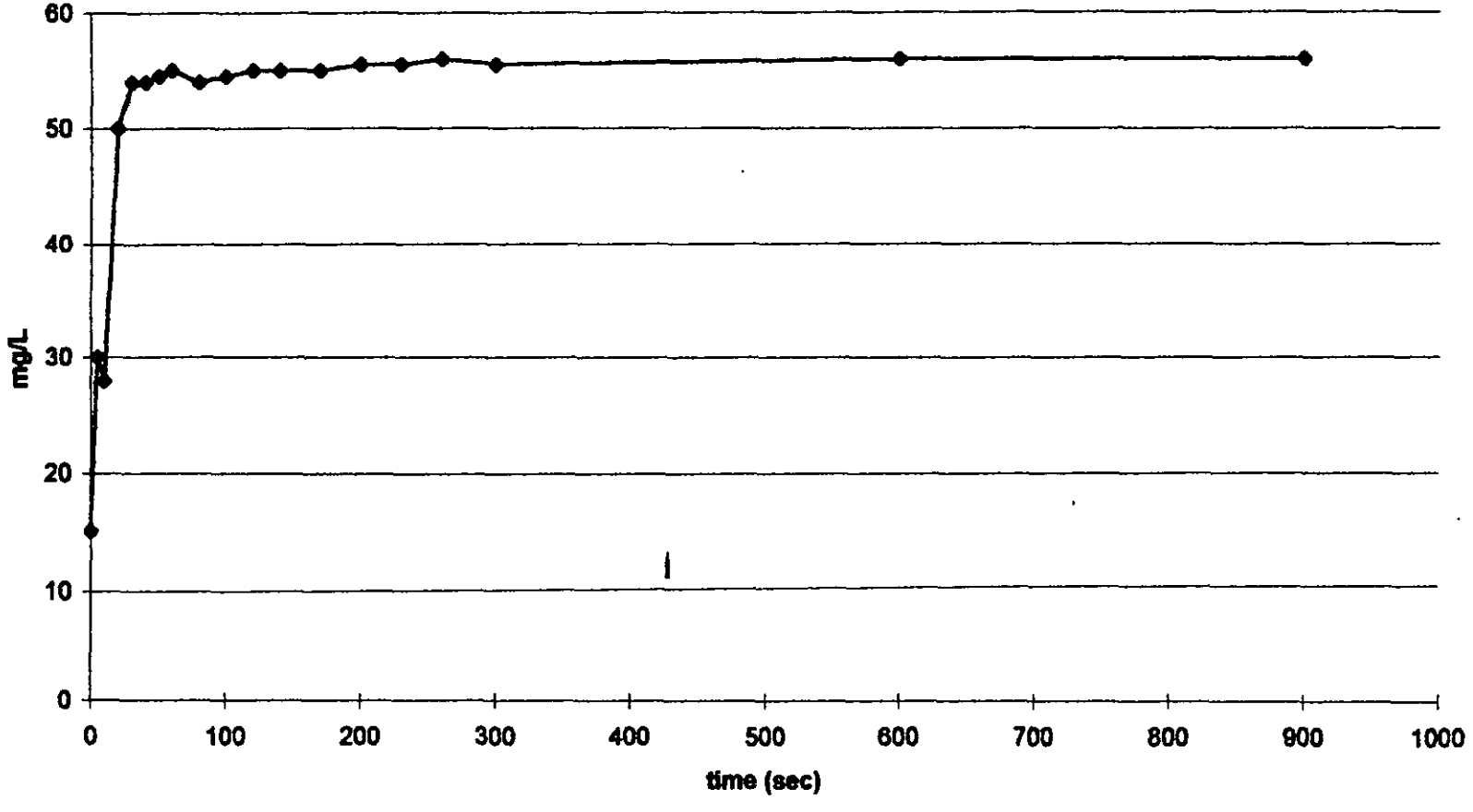
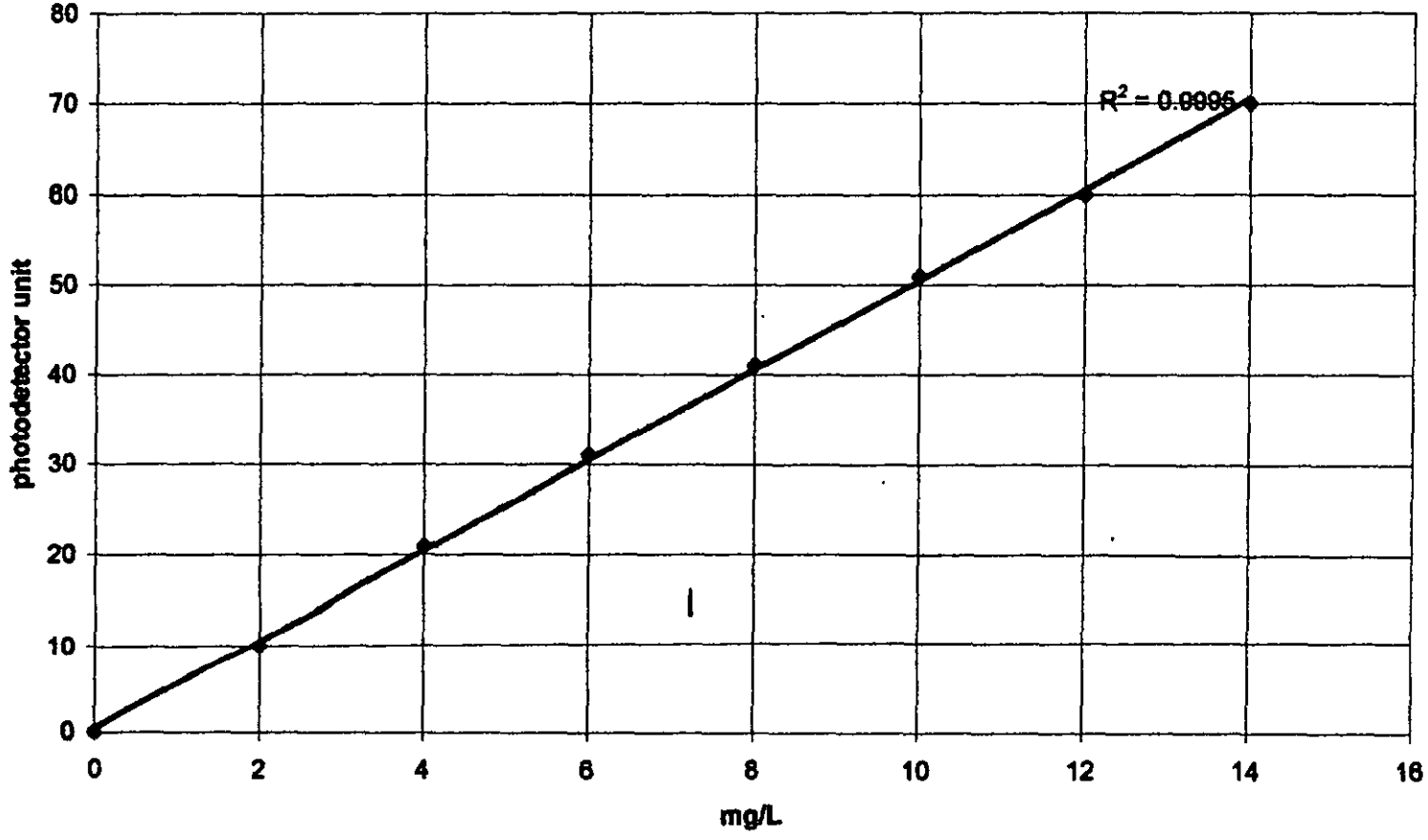
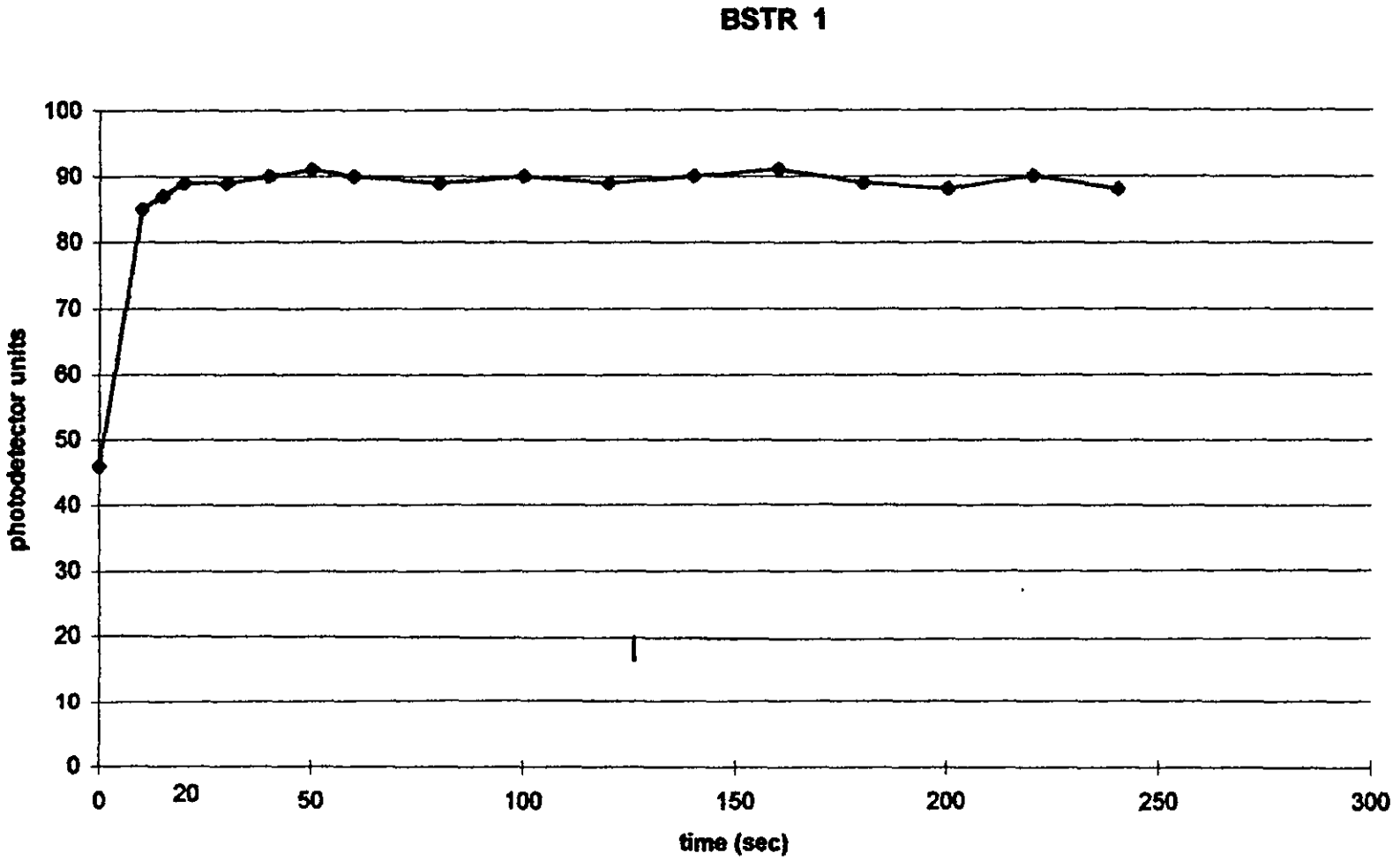


CHART 38

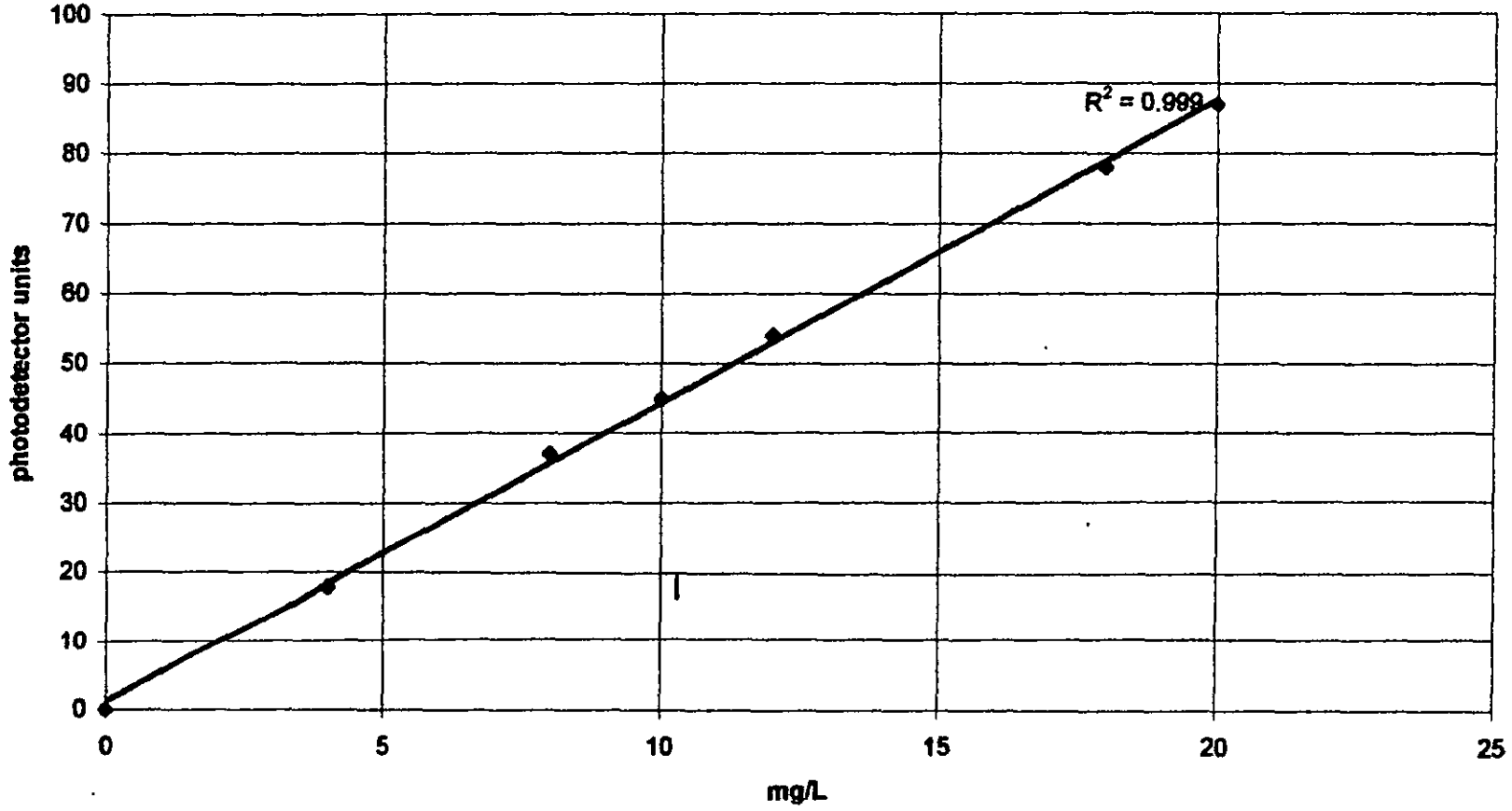

60
50
40
30
20
10
0
mg/L
0
100
200
300
400
500
600
700
800
900
1000
time (sec)

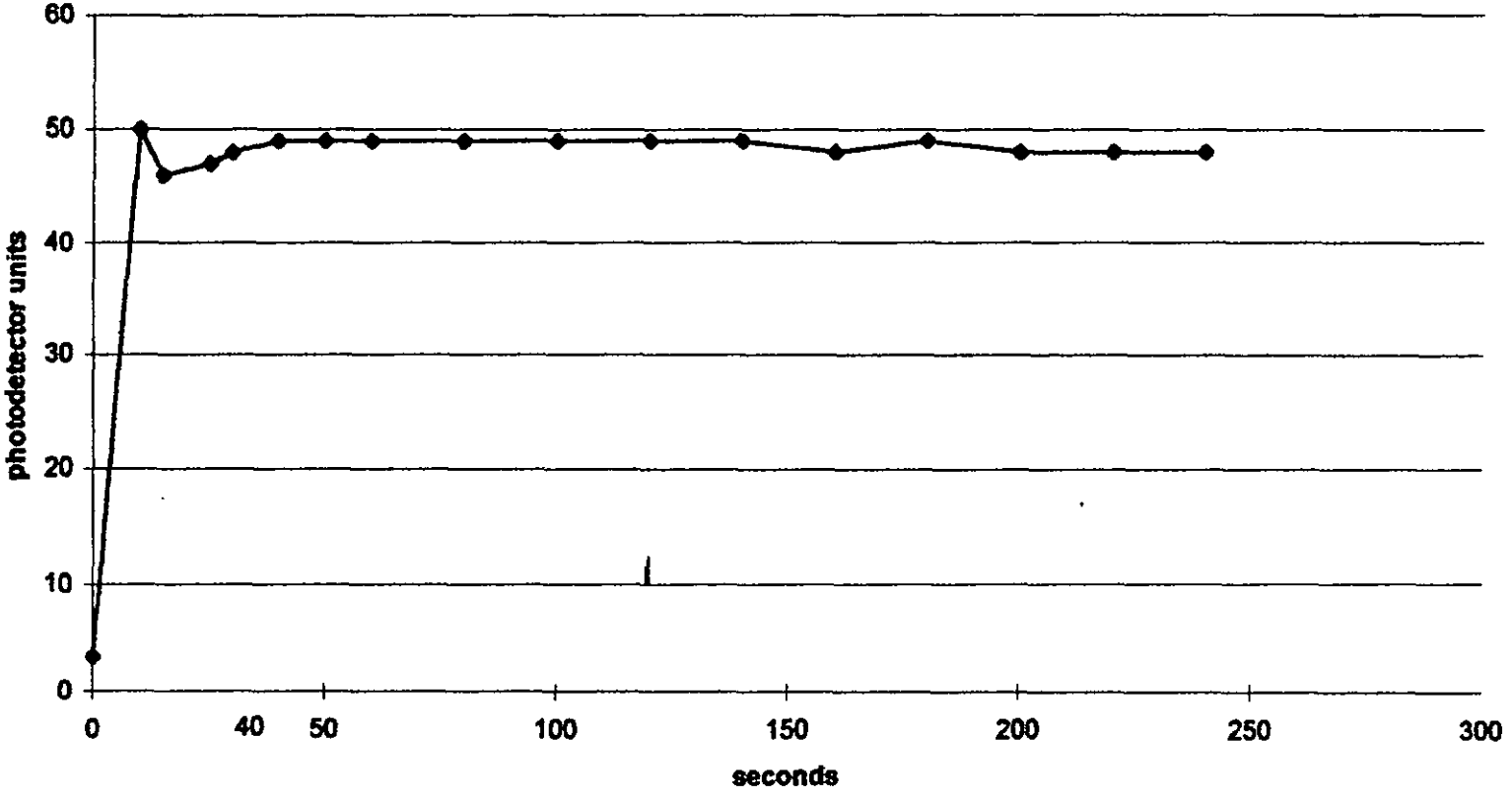
LITHIUM STANDARD 17(B)



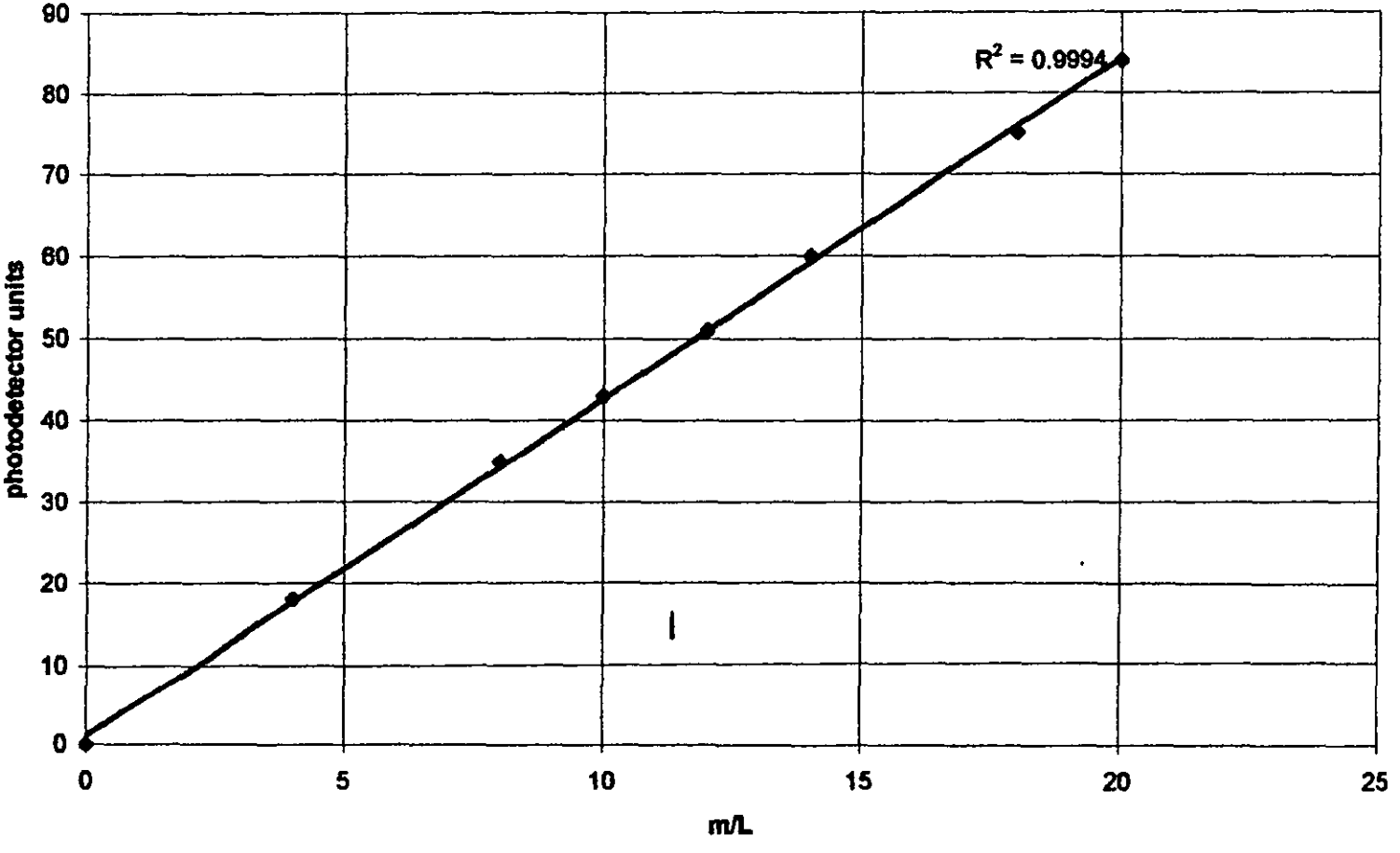

BSTR 1
100
90
80
70
60
50
40
30
20
10
0
photodetector units
0
20
50
100
150
200
250
300
time (sec)

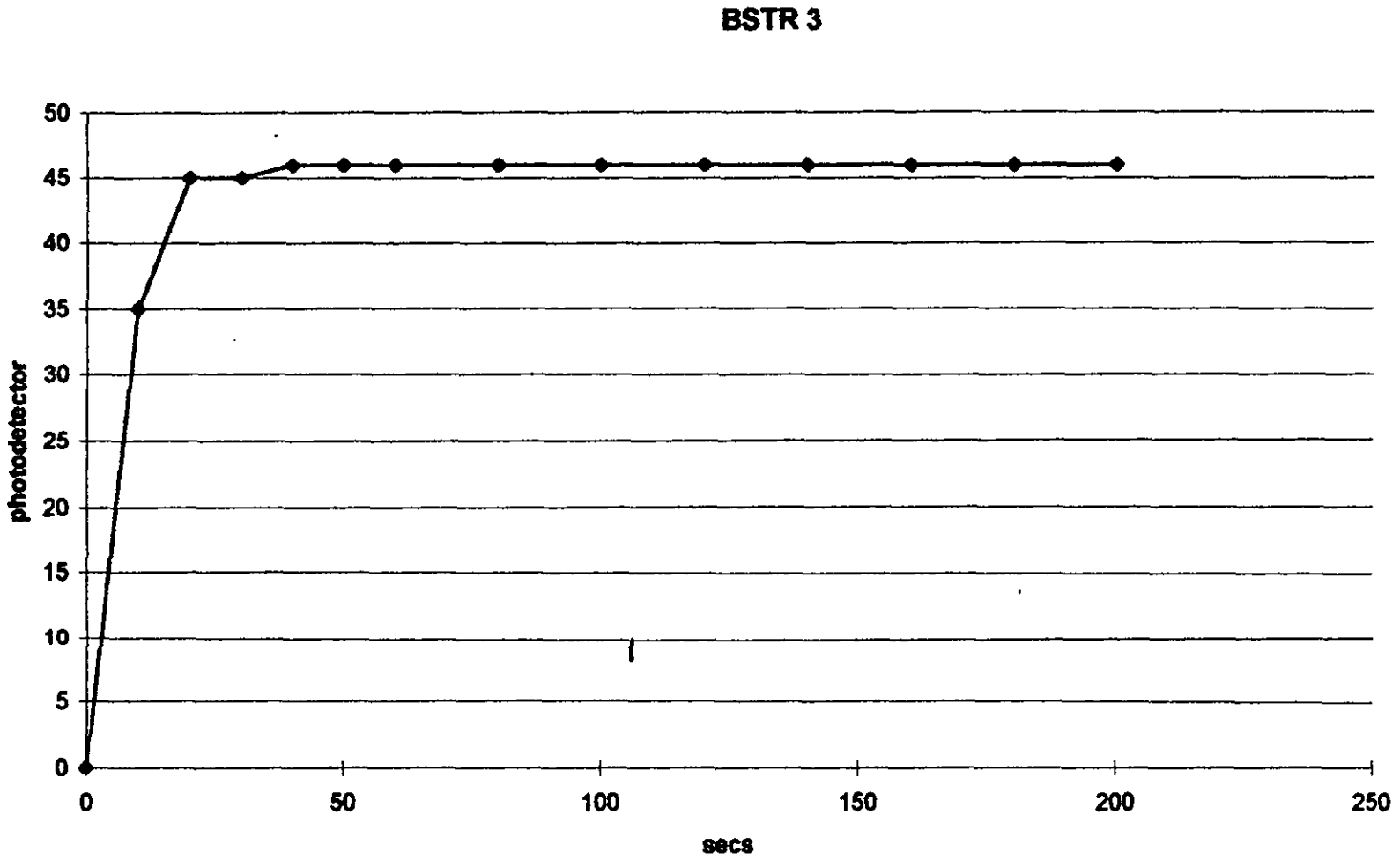
LITHIUM STANDARD 1



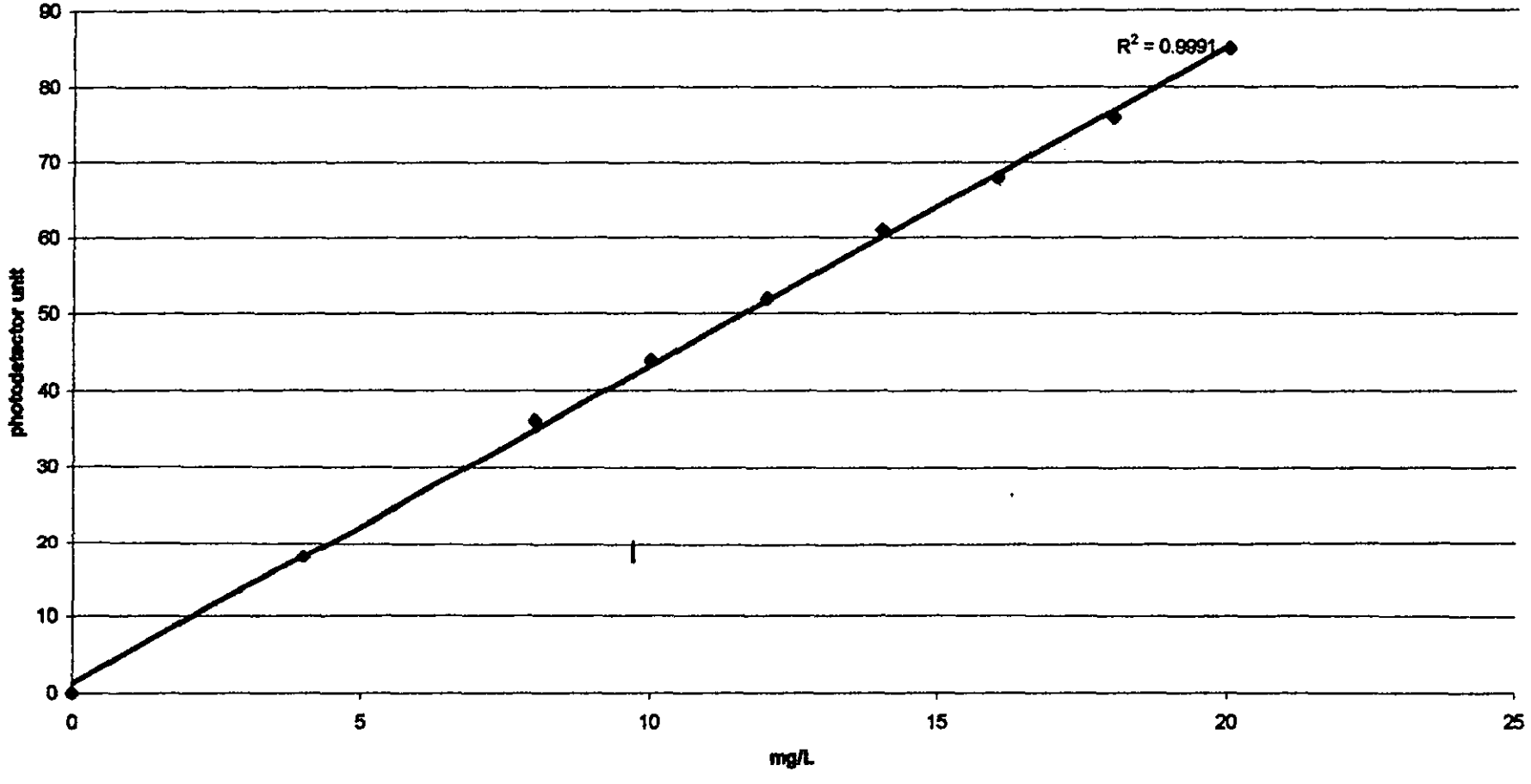

BSTR 2
60
50
40
30
20
10
0
photodetector units
0
40
50
100
150
200
250
300
seconds

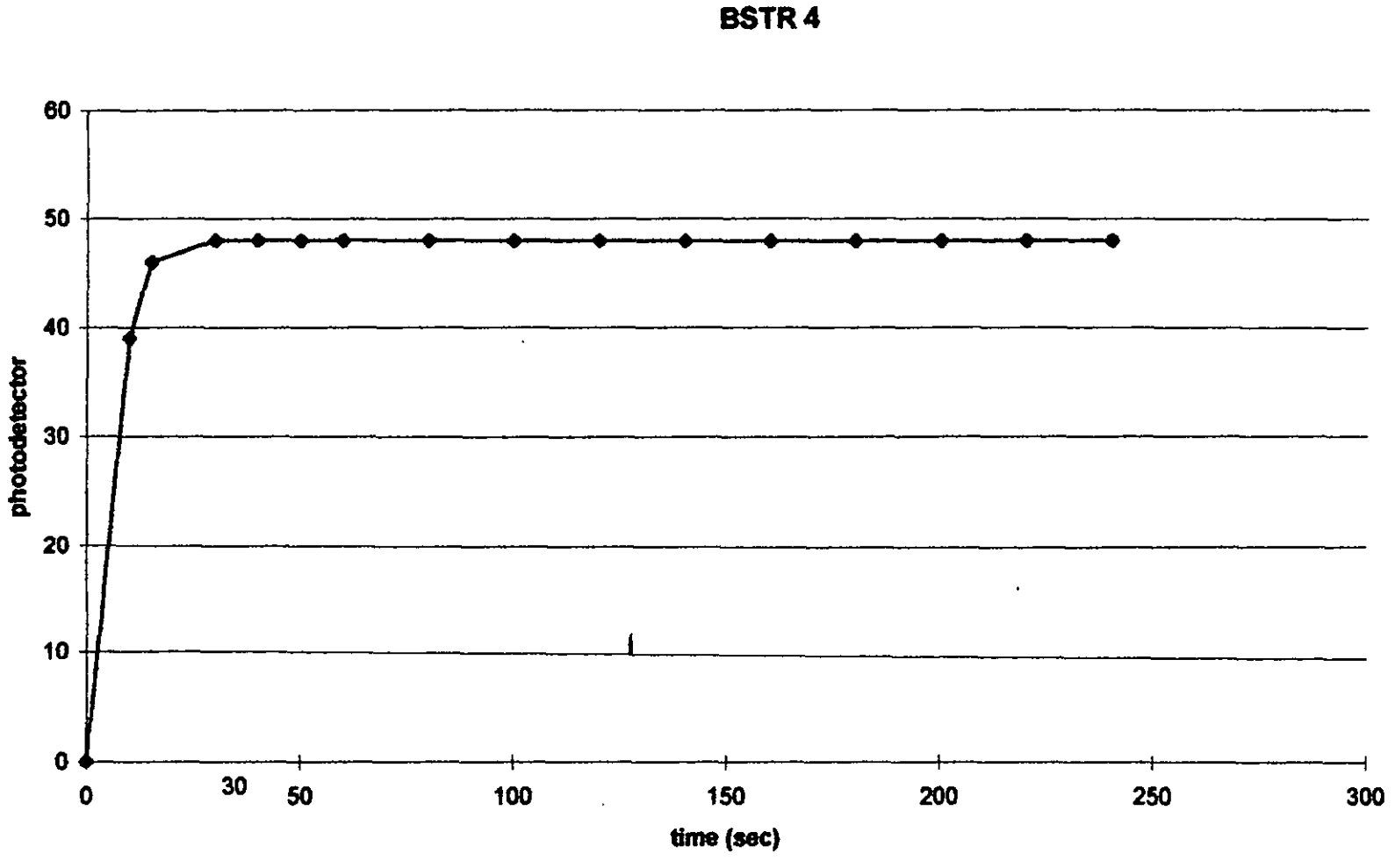
LITHIUM STANDARD 2



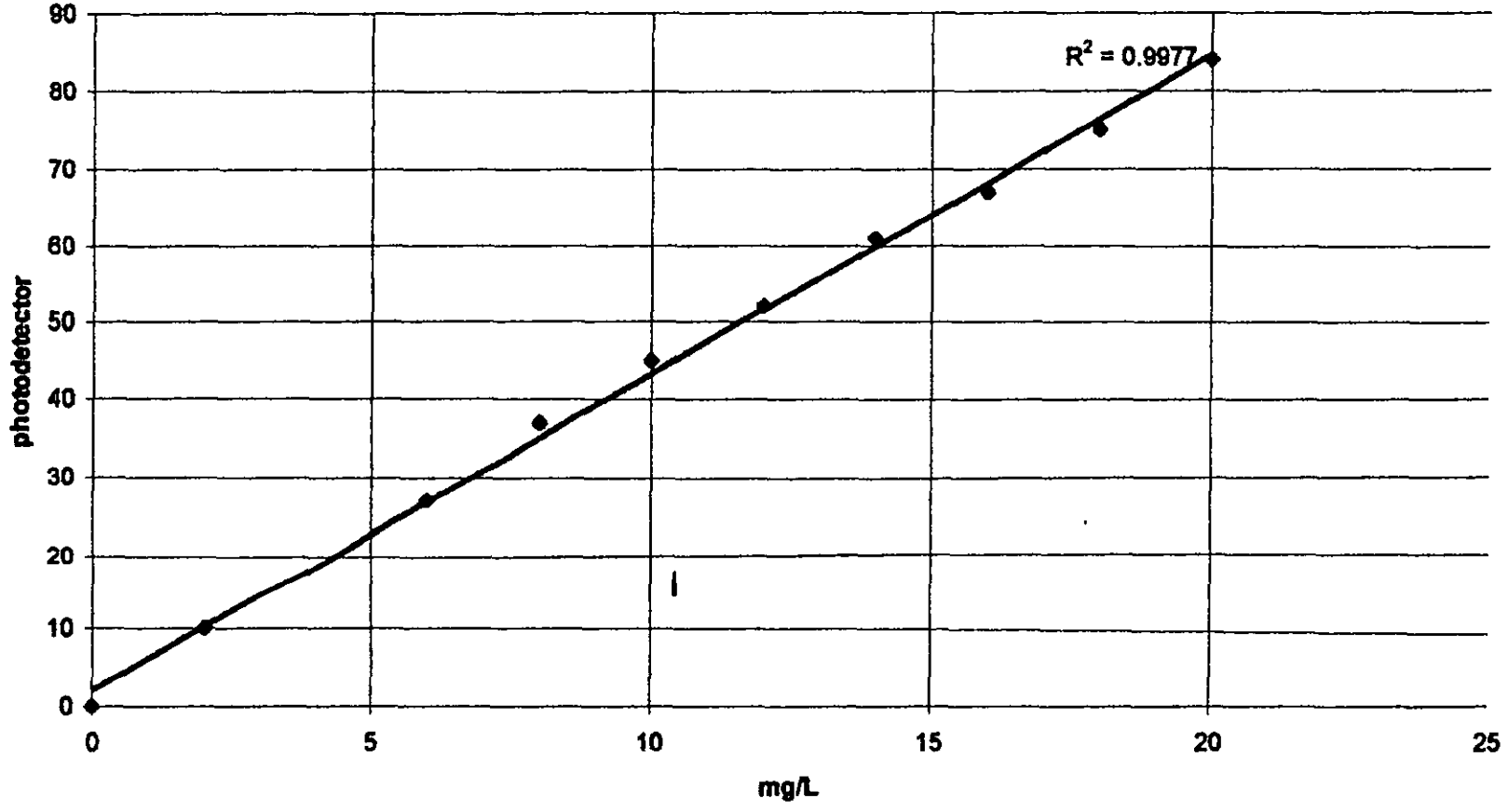

BSTR 3
photodetector
50
45
40
35
30
25
20
15
10
5
0
0
50
100
150
200
250
secs

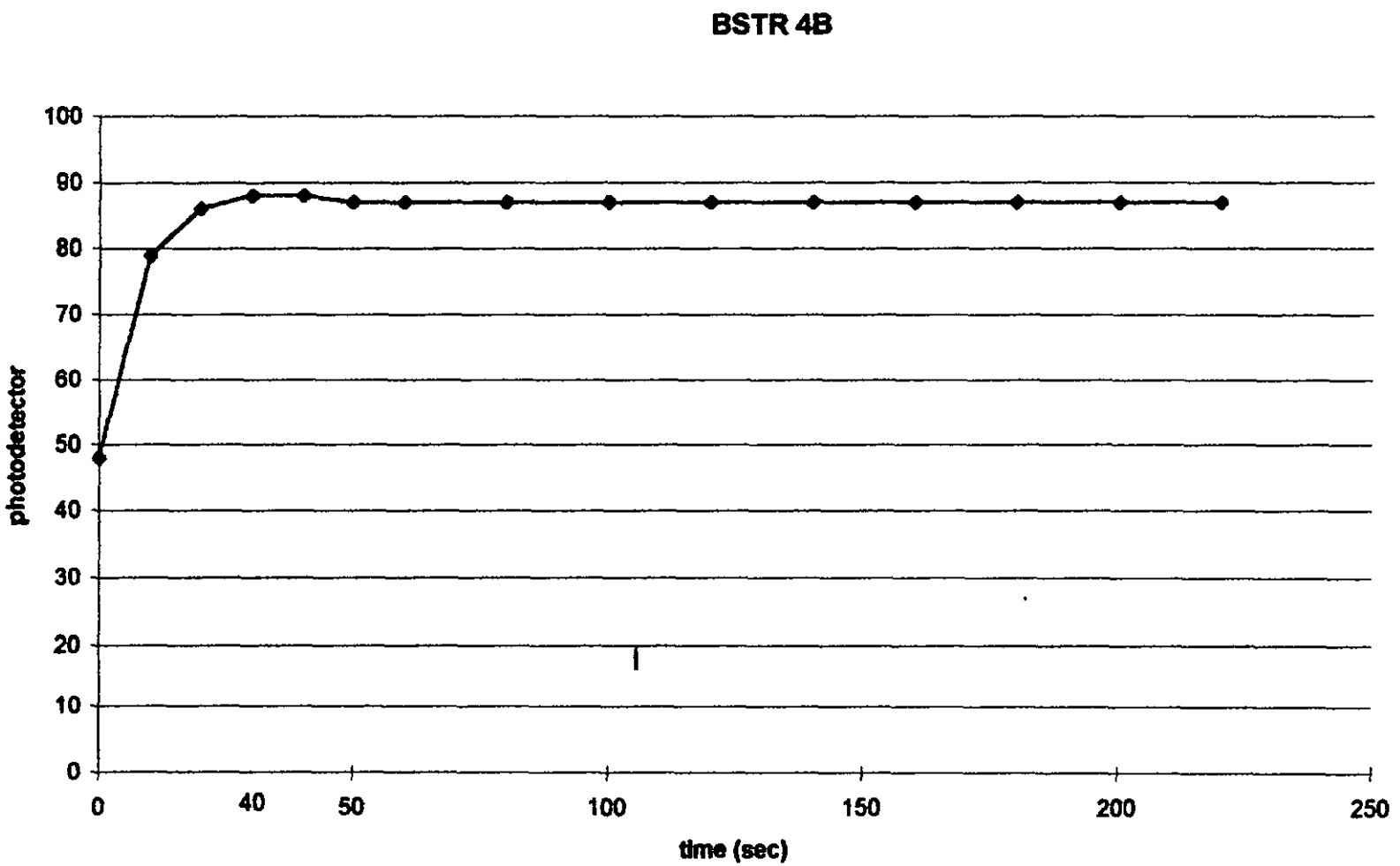
LITHIUM STANDARD 3

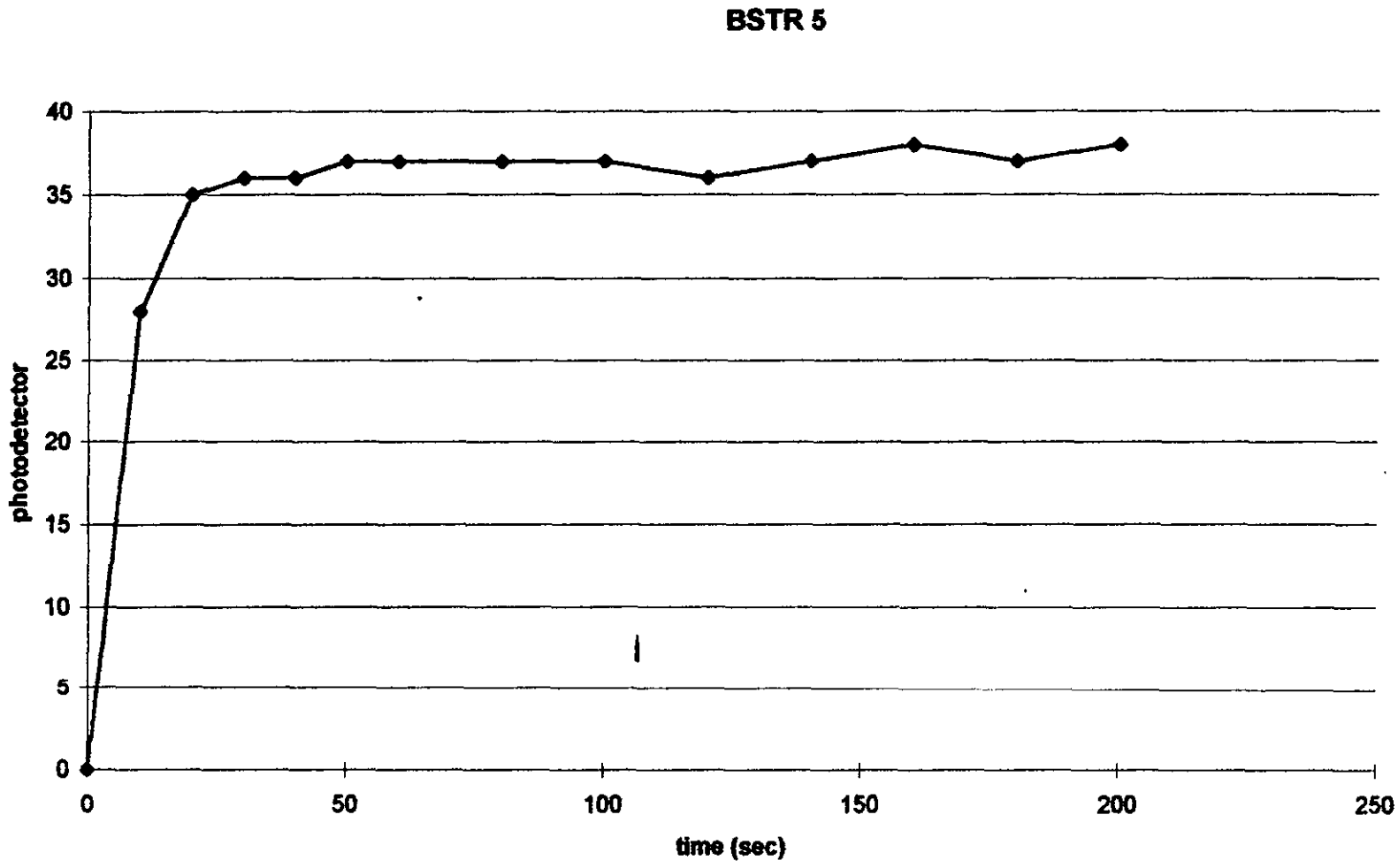



BSTR 4
60
50
40
30
20
10
0
photodetector
0
30
50
100
150
200
250
300
time (sec)

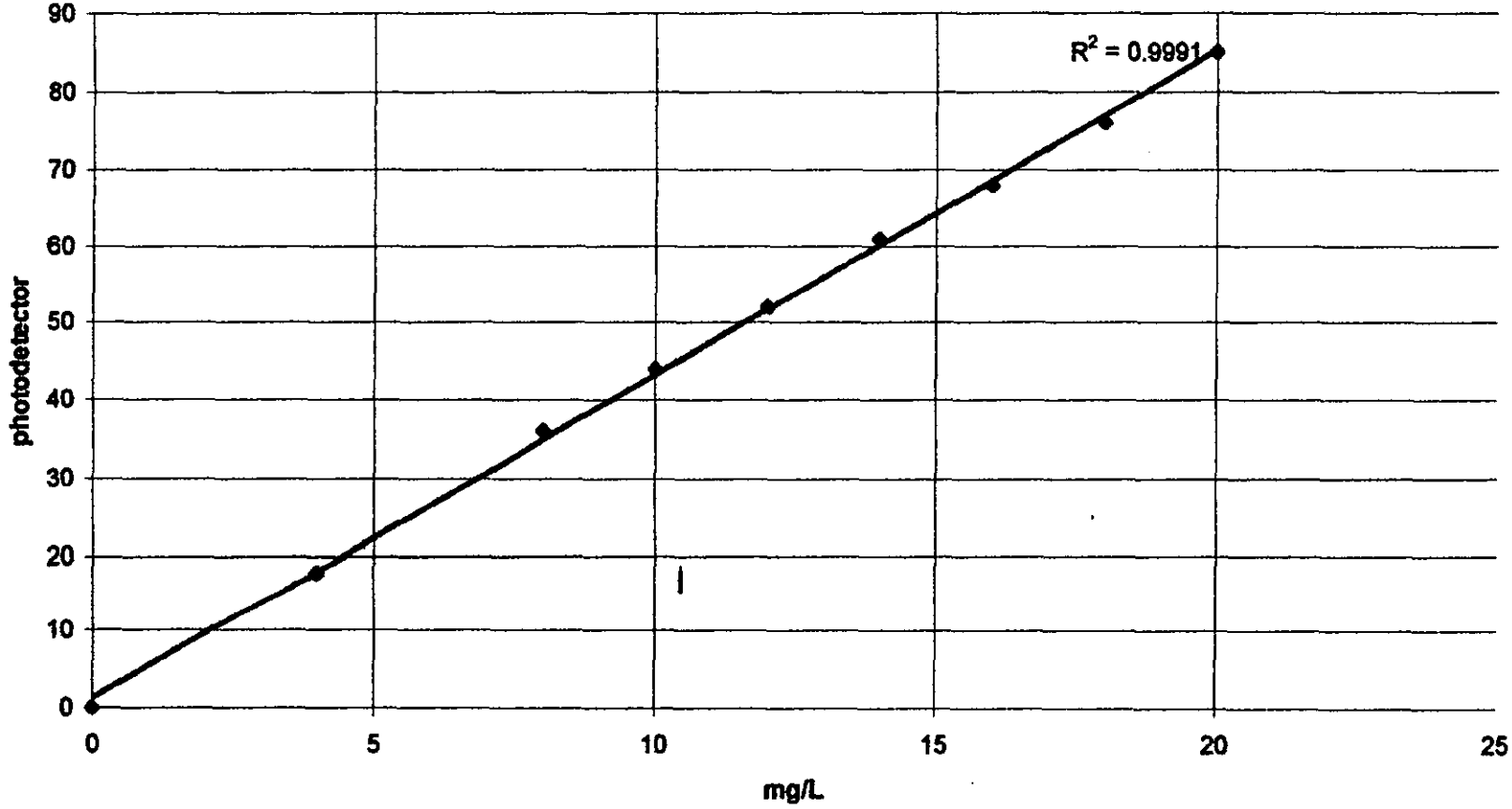
LITHIUM STANDARD 4

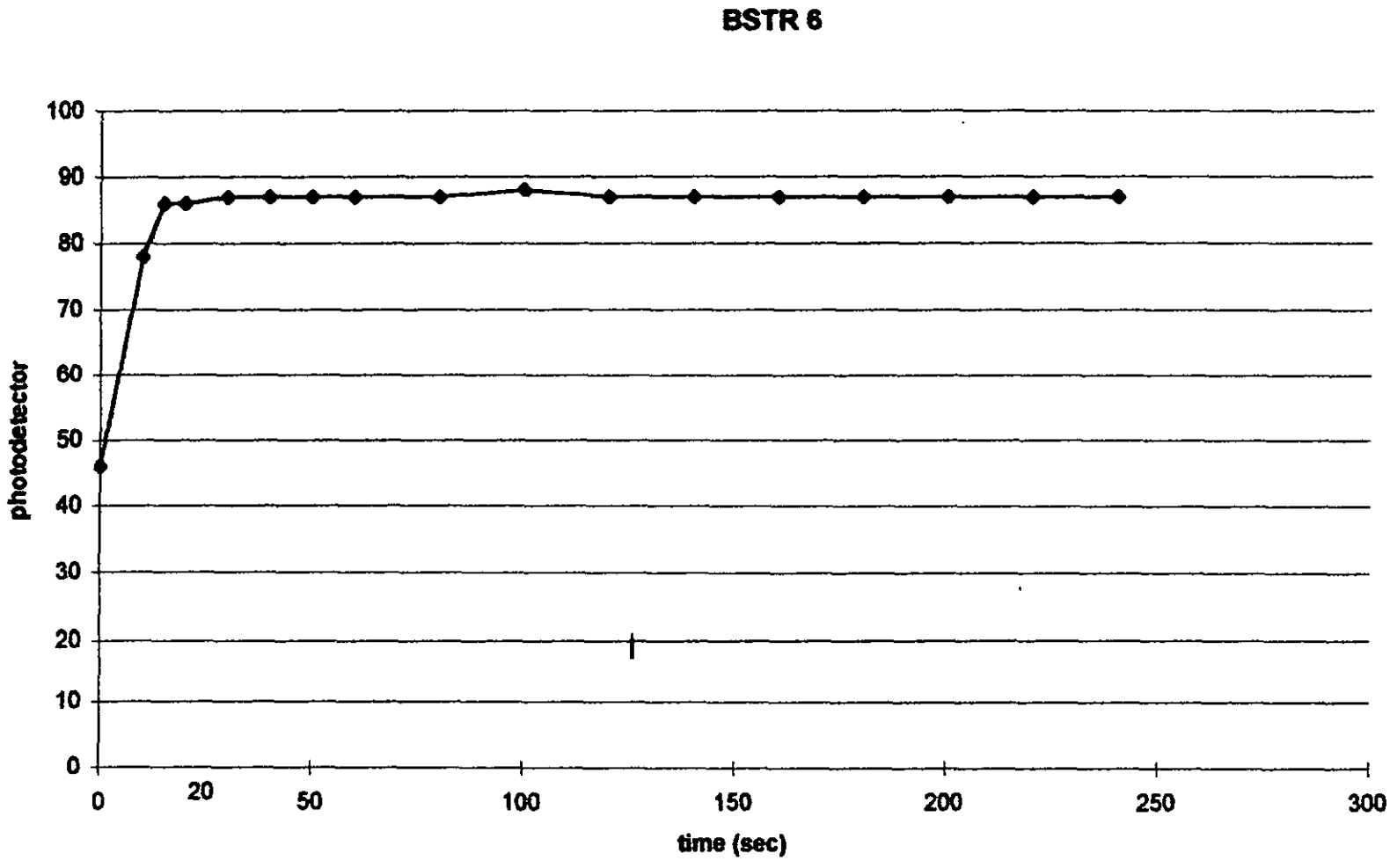



BSTR 4B
100
90
80
70
60
50
40
30
20
10
0
photodetector
0
40
50
100
150
200
250
time (sec)

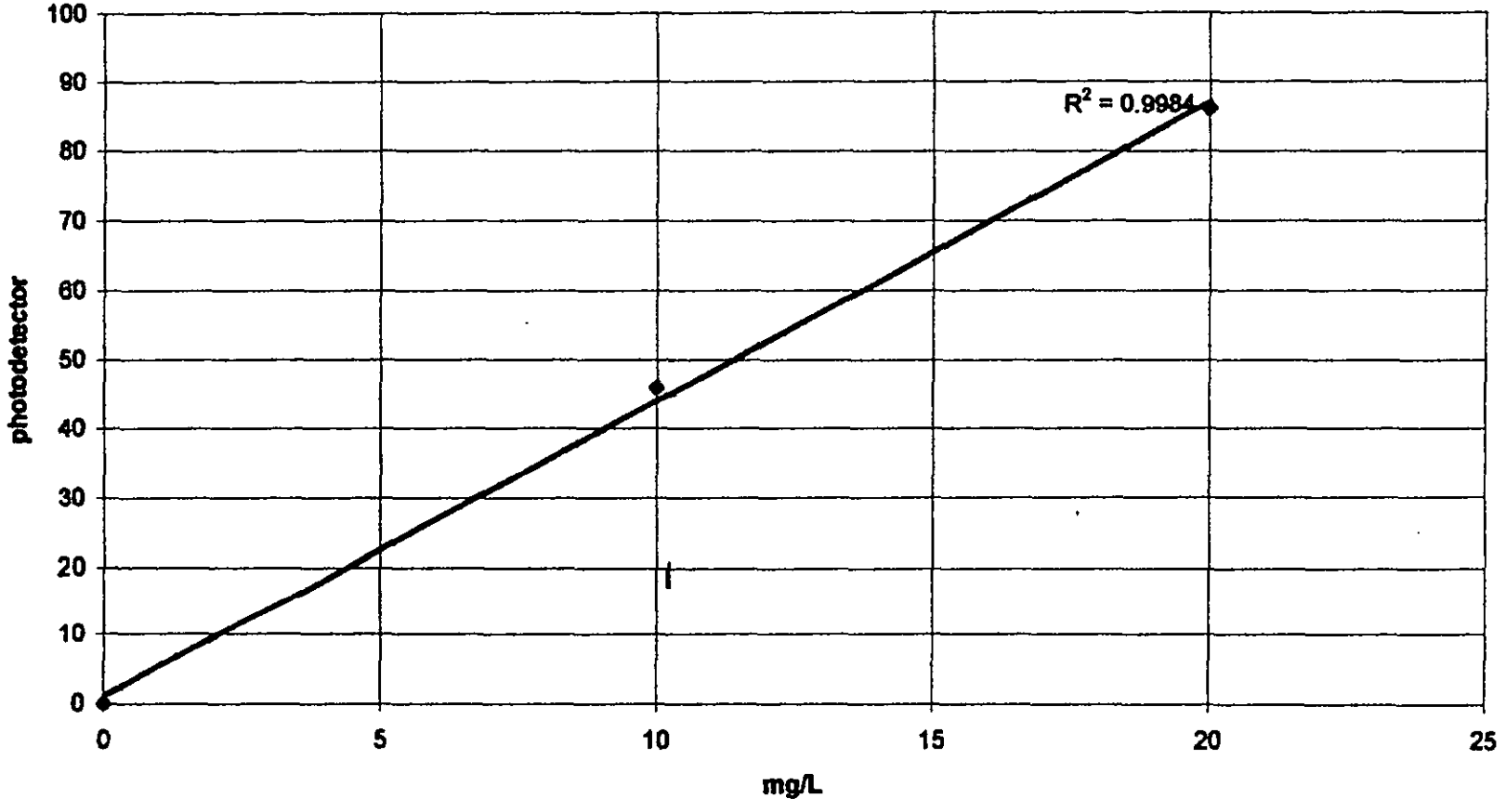

BSTR 5
photodetector
40
35
30
25
20
15
10
5
0
0
50
100
150
200
250
time (sec)

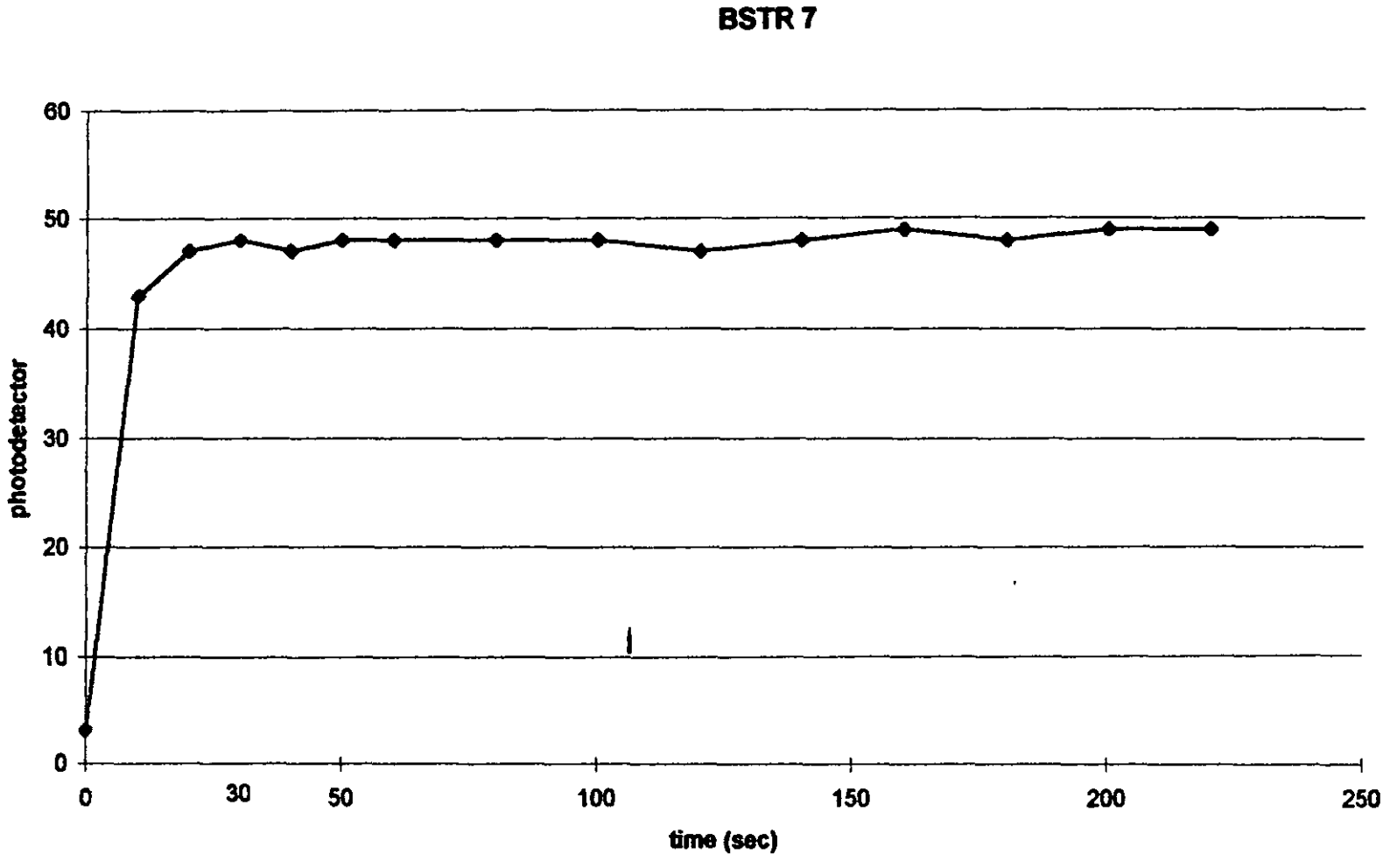
LITHIUM STANDARD 5



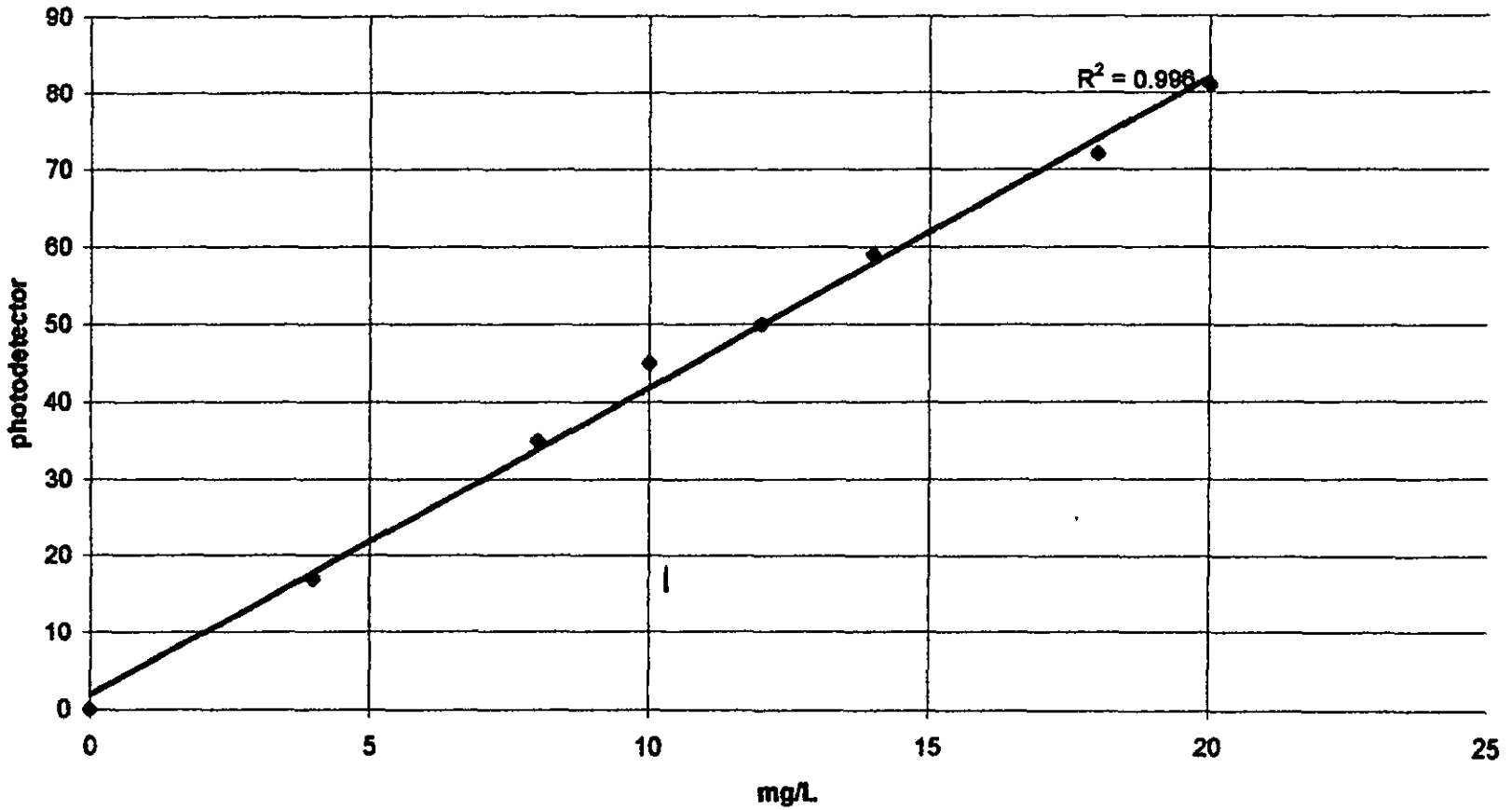

BSTR 6
100
90
80
70
60
50
40
30
20
10
0
photodetector
0
20
50
100
150
200
250
300
time (sec)

LITHIUM STANDARD 6




BSTR 7
60
50
40
30
20
10
0
photodetector
0
30
50
100
150
200
250
time (sec)

LITHIUM STANDARD 7

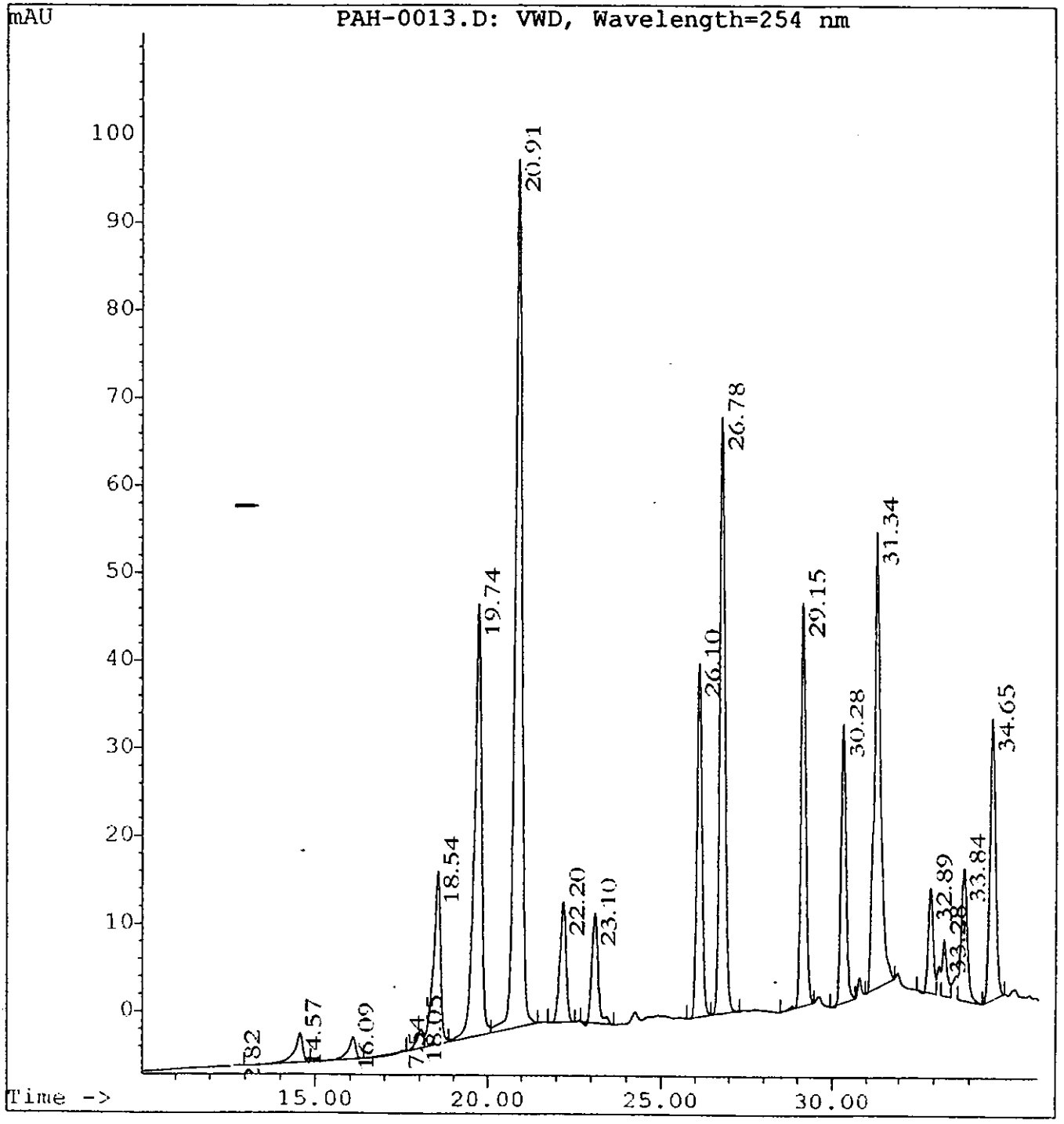


SET 3 – HPLC CHROMATOGRAMS

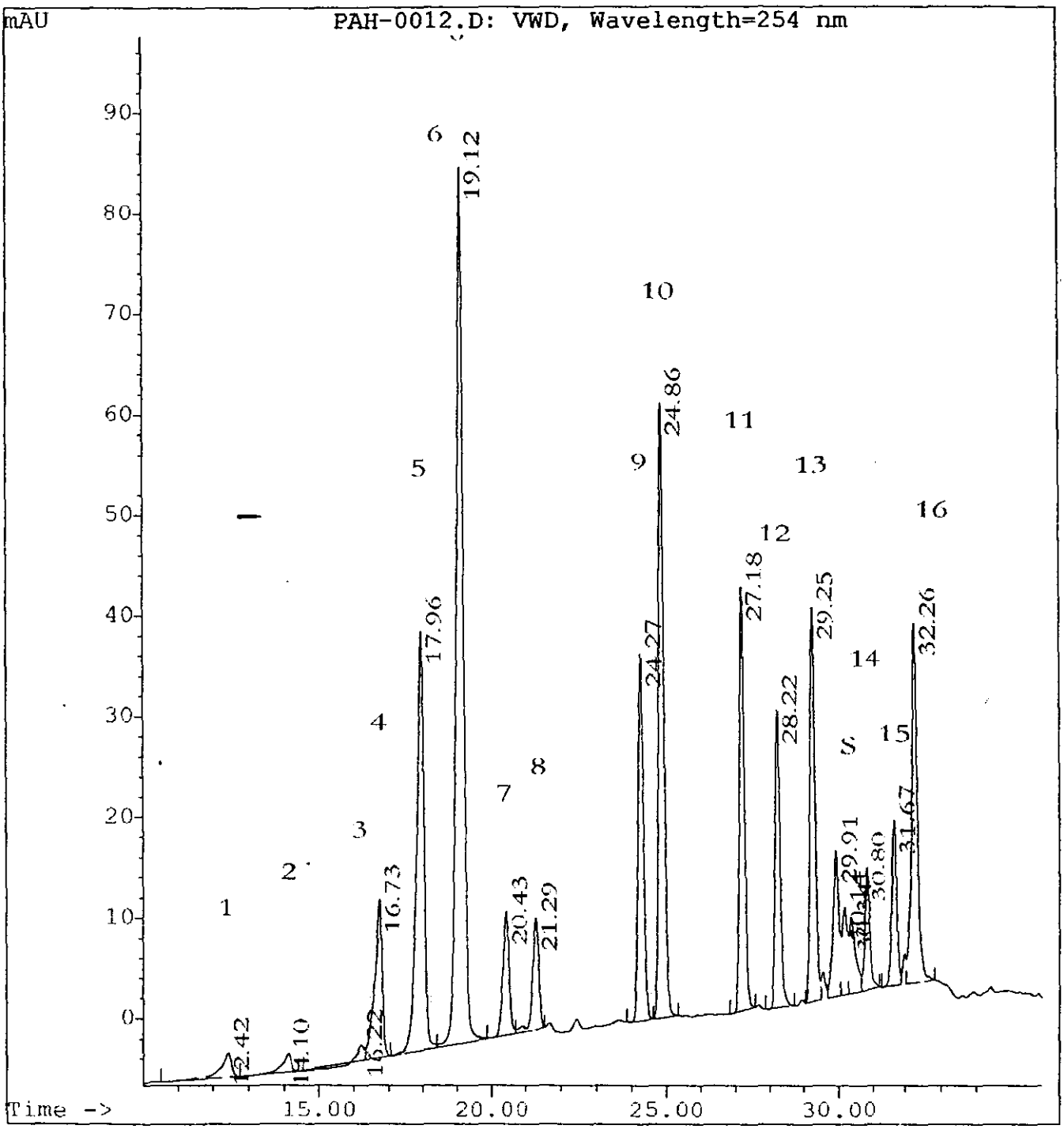
1. METHOD DEVELOPMENT CHROMATOGRAMS
2. METHOD DEVELOPMENT FOR UVD CHROMATOGRAMS
3. METHOD DEVELOPMENT. FLD TIMETABLE
4. METHOD DEVELOPMENT FOR FLD CHROMATOGRAMS
5. REPRODUCIBILITY OF SAMPLE PROCESSING THROUGH EMPORE DISCS
6. MINIMUM DETECTION LIMITS OF PAH STANDARD THROUGH EMPORE DISCS
7. INTERNAL SPIKE CHOICE
8. CALIBRATION CHROMATOGRAMS
9. REPRODUCIBILITY OF SAMPLE AND SPIKE THROUGH COLUMN
10. SLUDGE BASELINE CHROMATOGRAMS
11. BASIC BSTR CHROMATOGRAMS
12. AIRLIFT BSTR CHROMATOGRAMS
13. INIPOL AMENDED BSTR CHROMATOGRAMS

		Notes and Comments on Chromatograms
1	Chrom	**Method development chromatograms**
	12	Earliest separations of PAH standards with Vydac column. 2000ug/L. UV-vis at 254 fixed wavelength.
		Supah 8 method
	13	PAH standard 2000ug/L as above with Supah 9 method. Similar separation.
	21	PAH standard 1000ug/L . Supah 8 method.
	16	Blank , adsorption peak at approximately RT 31.16.
	22	Blank , adsorption peak at approximately RT 31.20.
	53	Lichros. Column. Acenapthene peak placement RT=15.34. Very low. Require manual integration. Conc. 50ug/l.
	34	Lichros. Column.Naphthalene peak placement RT=11.655.
	121	Phenomenax column . Water blank. As seen on Y axis , it is very low absorption.
	122	Phenomenax column .Solvent blank. As seen on Y axis , it is very low absorption.
	132	Phenomenax column. Phenanthrene peak placement RT = 11.7
	41	Phenomenax column. Chrysene peak placement RT = 21.9
	131	Phenomenax column. Acenaphthene peak placement RT = 10.091
	148 , 181, 182	Phenomenax column. Spike peak placement RT 13.3
	173	Phenomenax column. Naphthalene and spike RT N at 11.76 and spike at 13.289

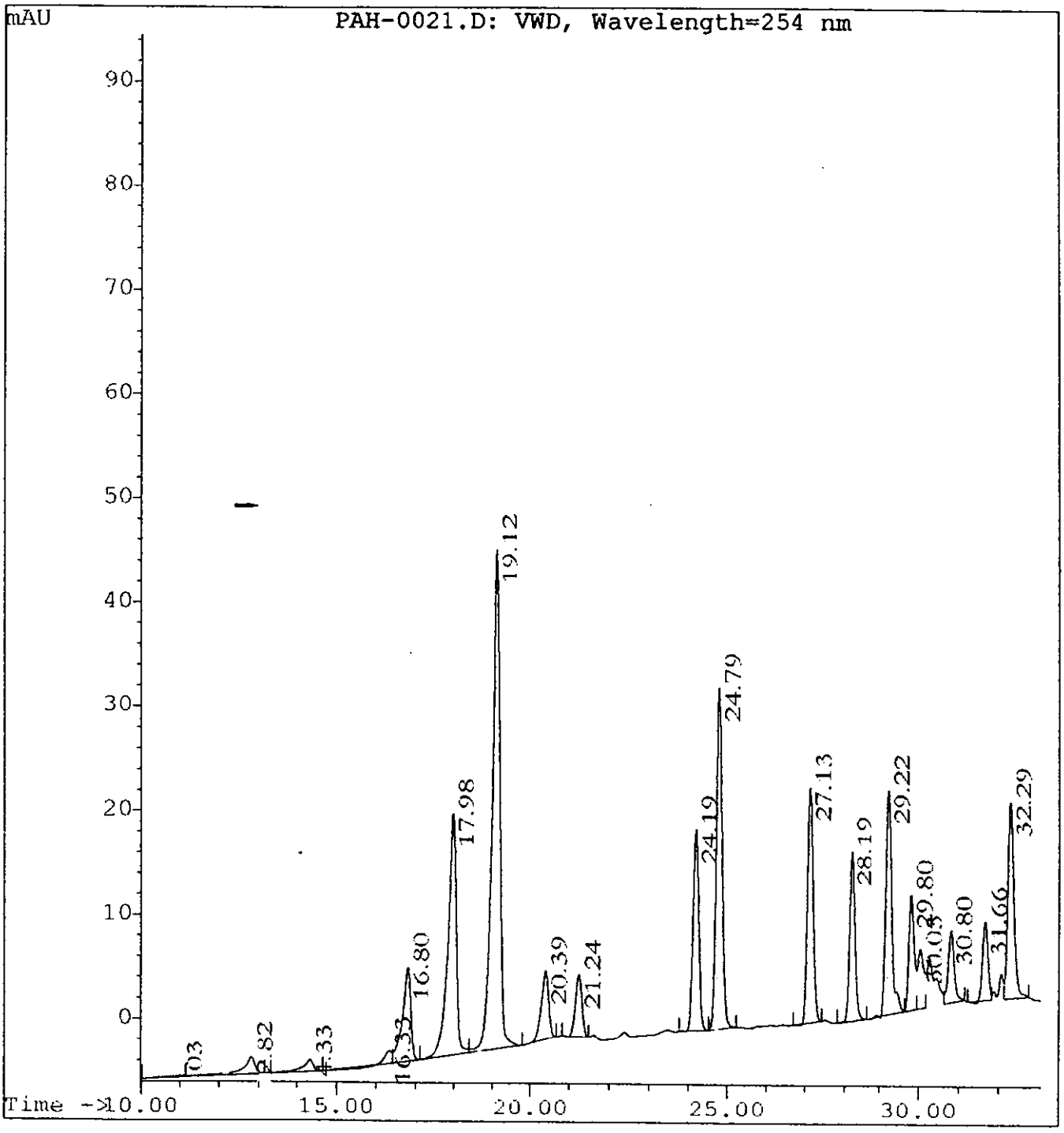
File: A:\SUHANA\PAH-0013.D
Operator: SUHANA
Date Acquired: Fri Apr 16 17:12:47 1993
Method File Name: SUPAH9.M
Sample Name: PAH.STD.2000mg/L
Misc Info:
Bottle Number: 1



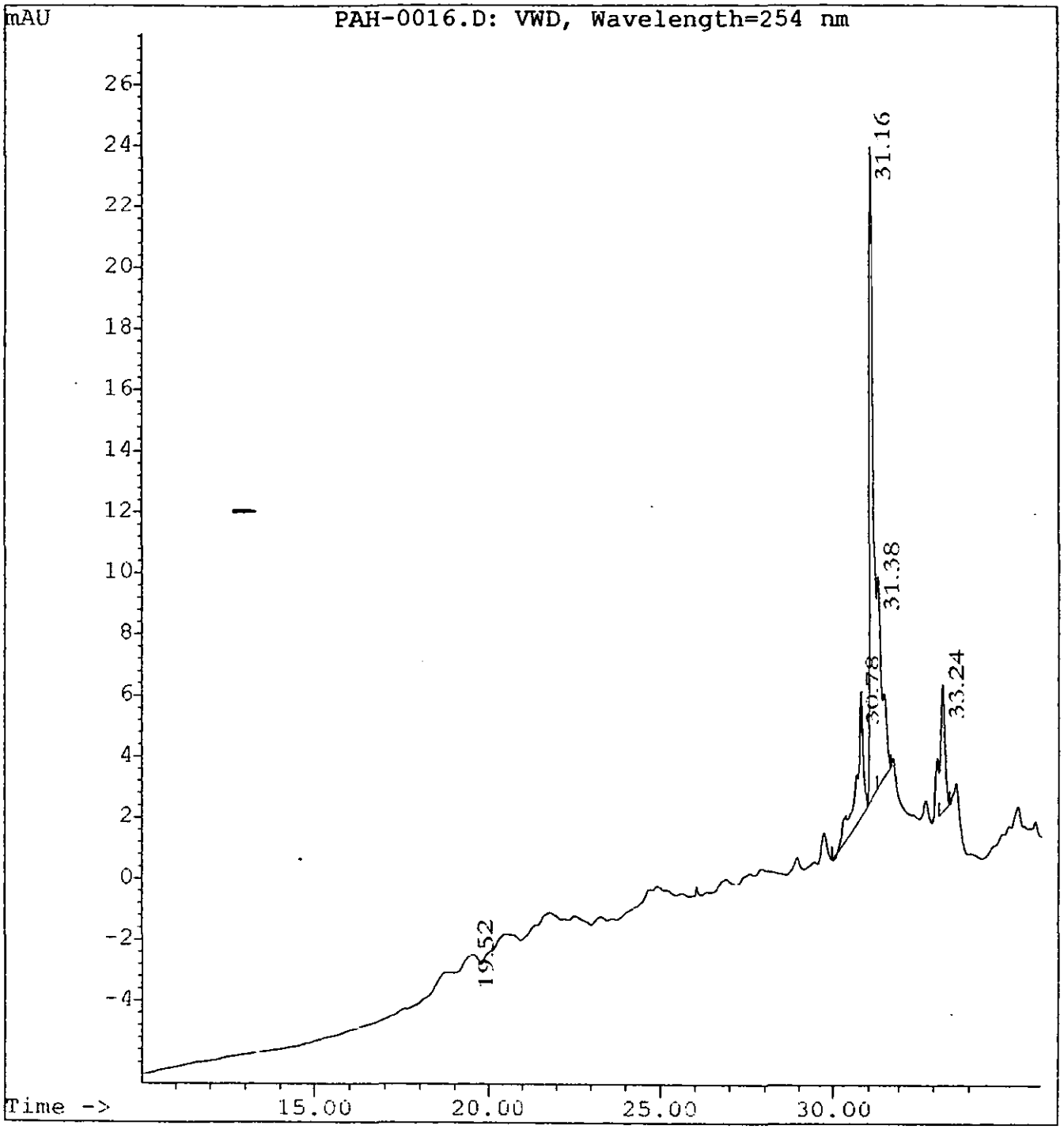
File: A:\SUHANA\PAH-0012.D
Operator: SUHANA
Date Acquired: Fri Apr 16 16:12:52 1993
Method File Name: SUPAH8.M
Sample Name: PAH.STD.2000mg/L
Misc Info:
Bottle Number: 1



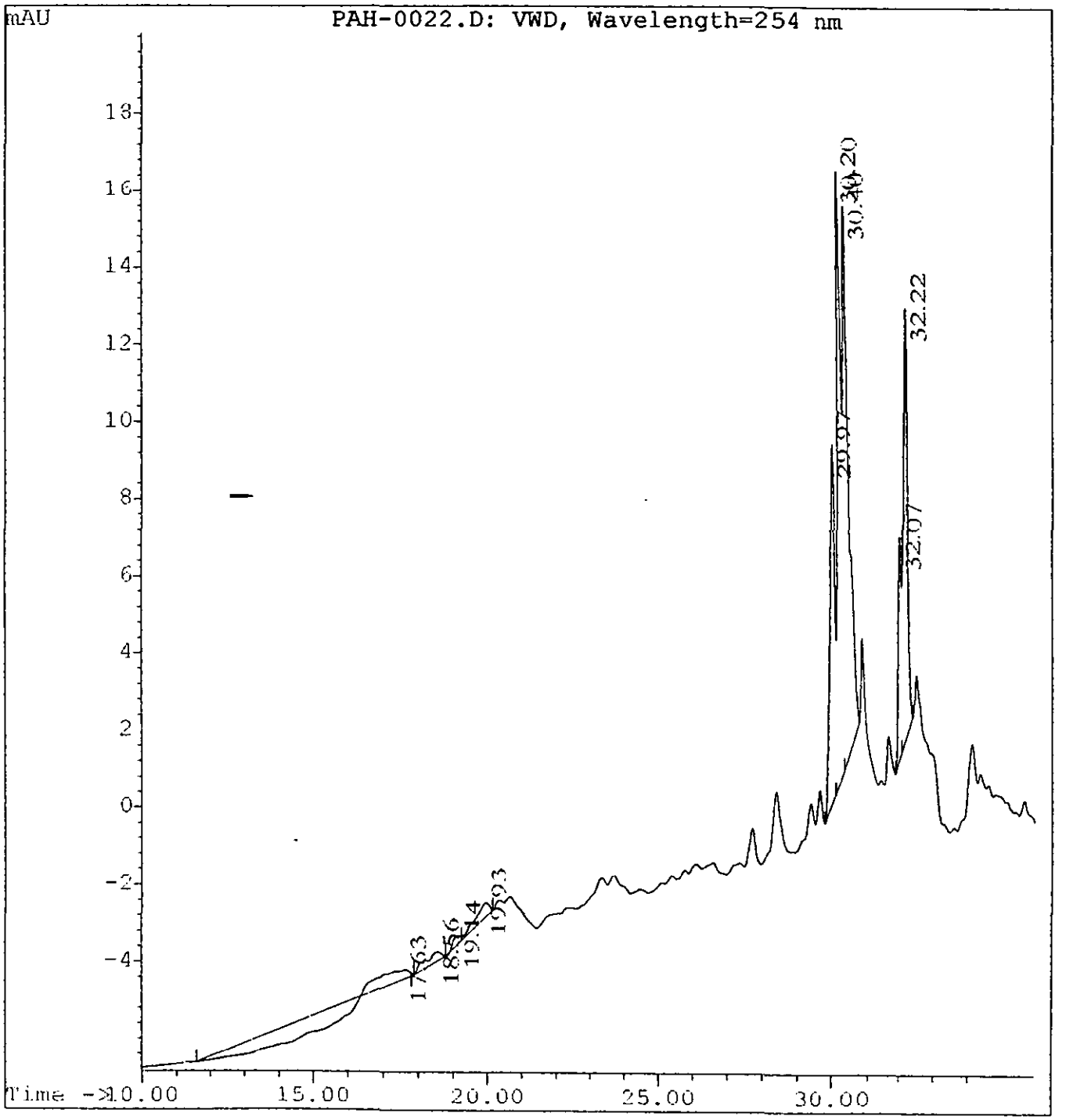
File: A:\SUHANA\PAH-0021.D
Operator: SUHANA
Date Acquired: Sun Apr 18 18:33:00 1993
Method File Name: SUPAH8.M
Sample Name: PAH.STD1000mg/l
Misc Info:
Bottle Number: 1

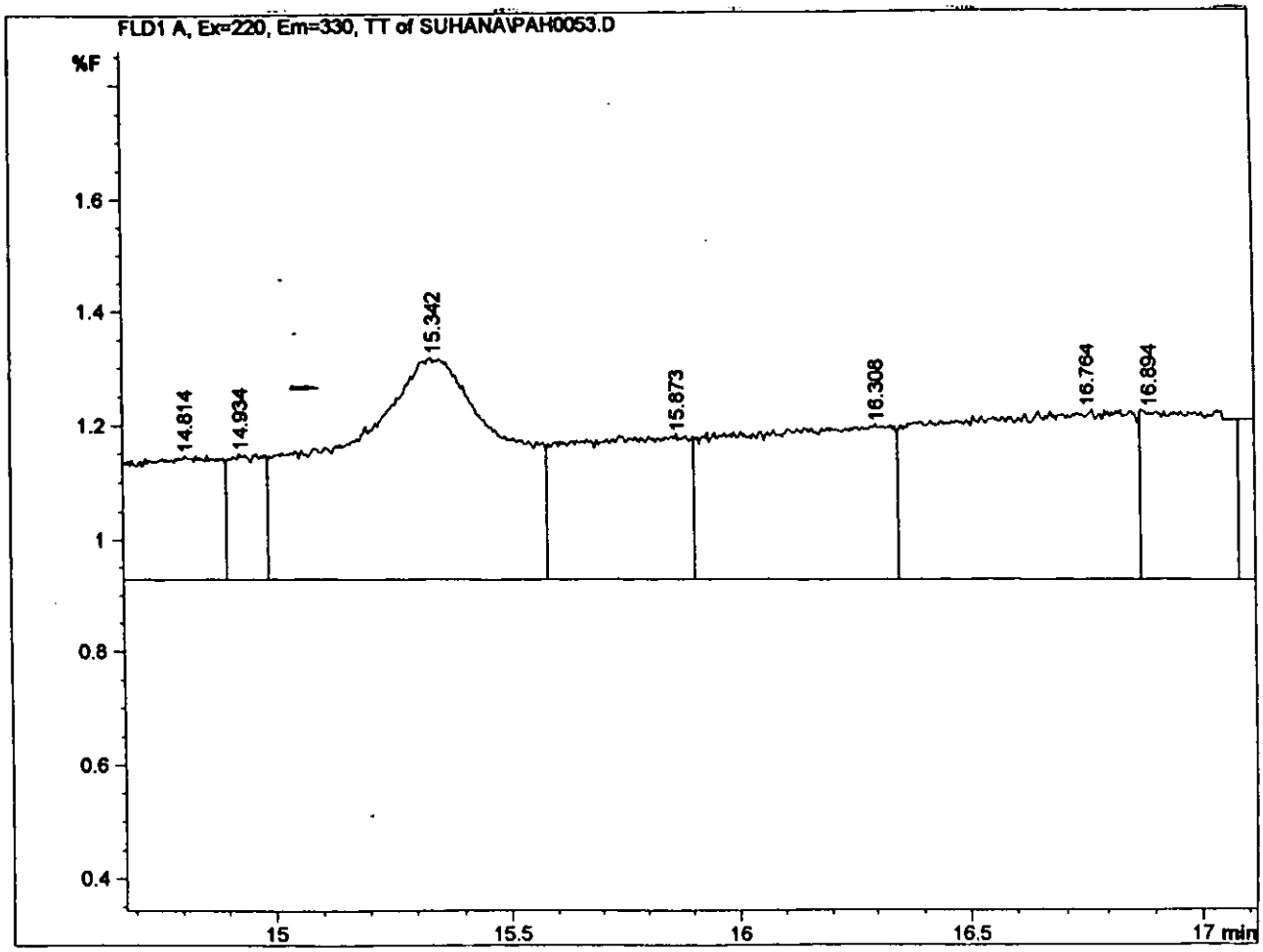


File: A:\SUHANA\PAH-0016.D
Operator: SUHANA
Date Acquired: Sun Apr 18 14:27:40 1993
Method File Name: SUPAH9.M
Sample Name: PAH.STD.blank
Misc Info:
Bottle Number: 1



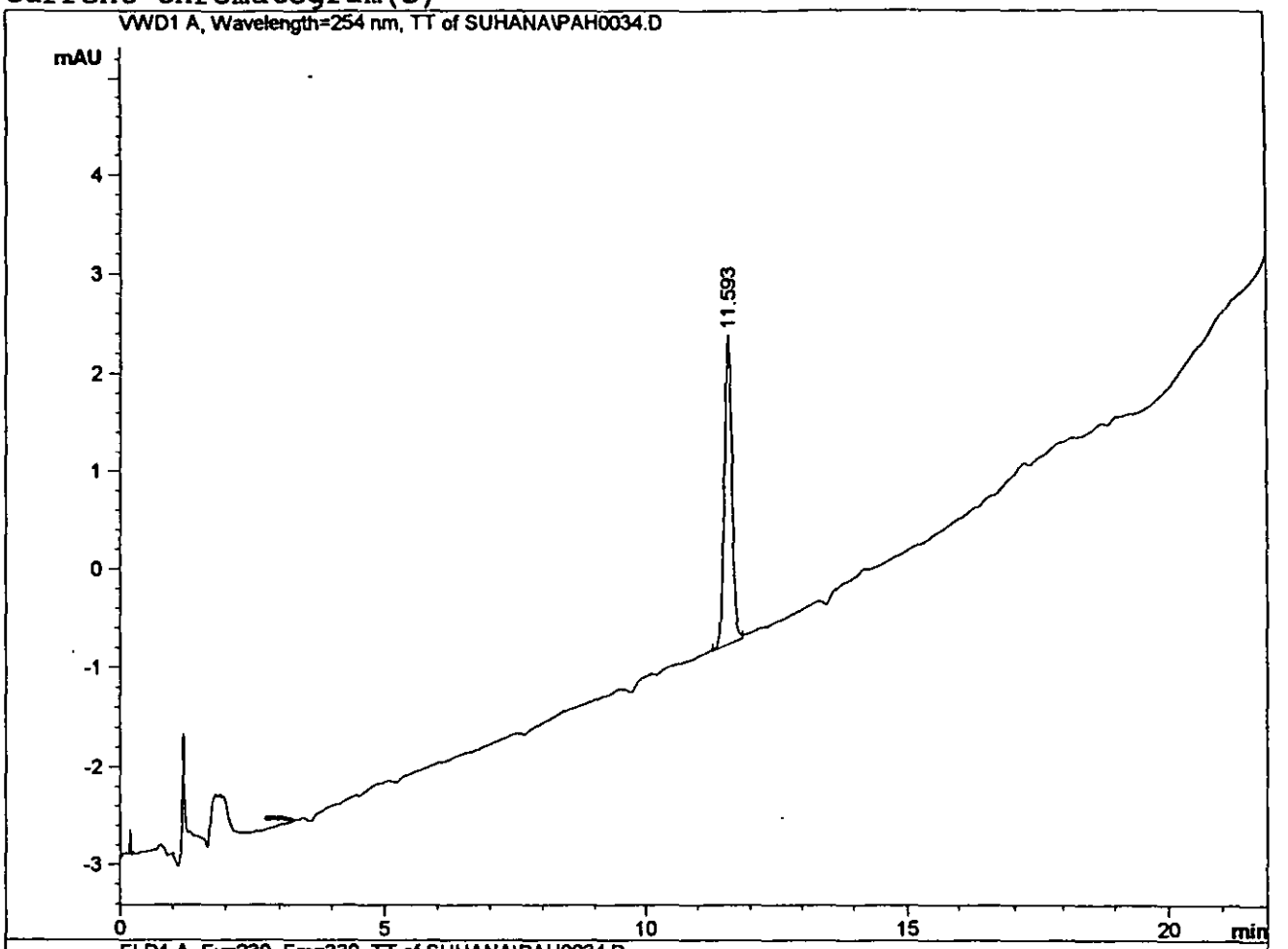
File: A:\SUHANA\PAH-0022.D
Operator: SUHANA
Date Acquired: Mon Apr 19 11:44:43 1993
Method File Name: SUPAH8.M
Sample Name: PAH.STD blank
Misc Info:
Bottle Number: 1

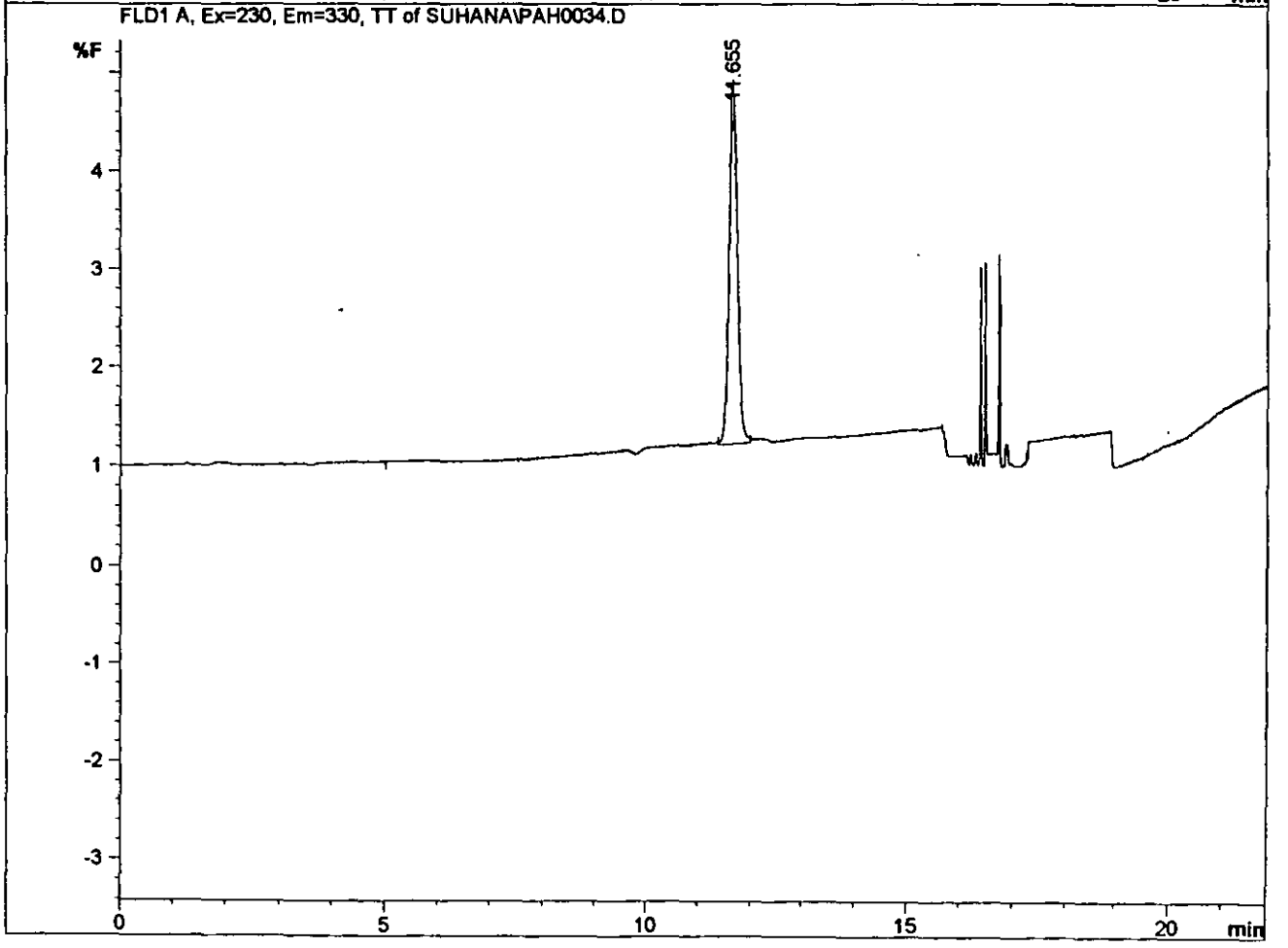




Sunday, August 25, 1996 18:45:49 by suhana

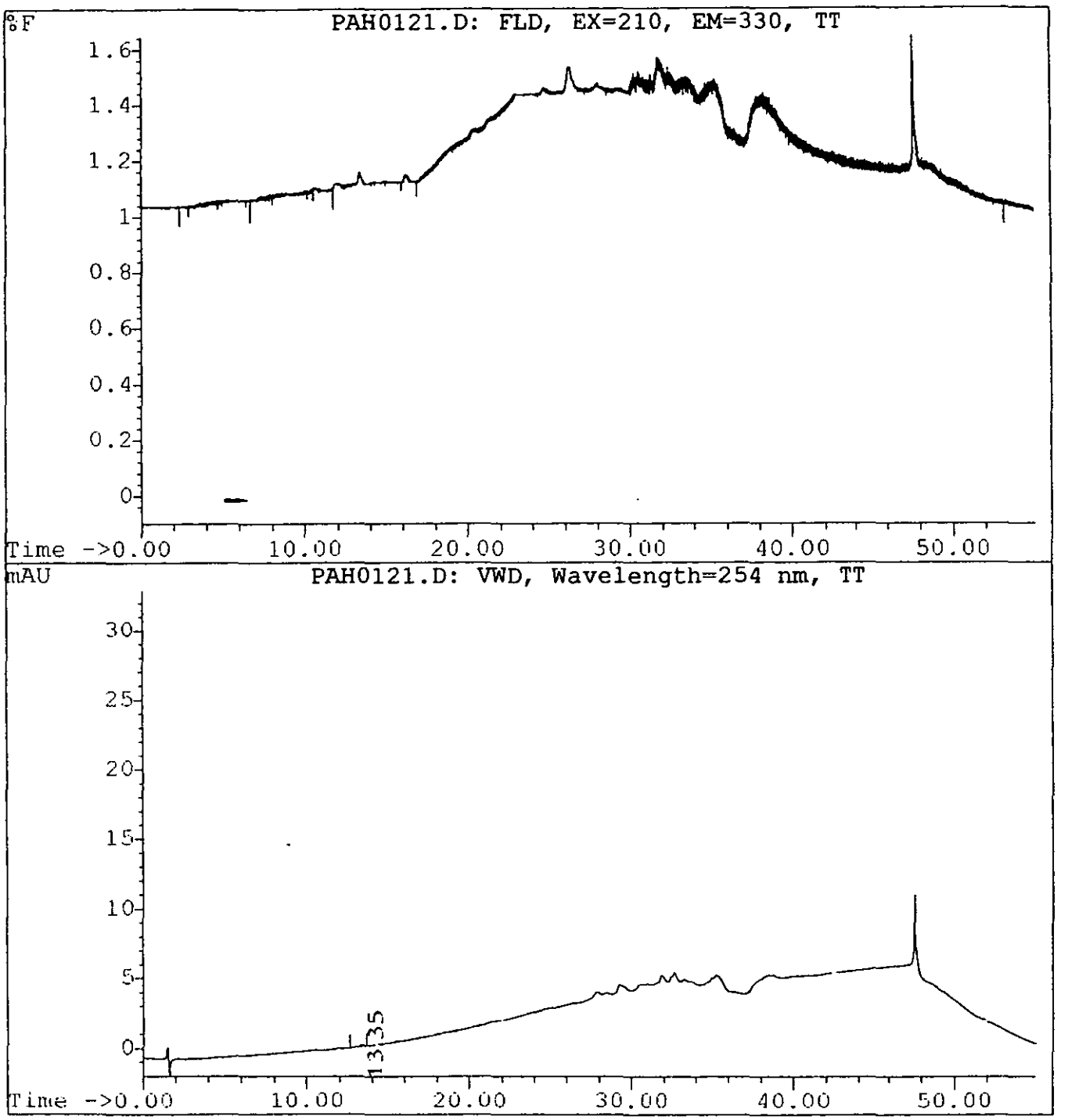
Current Chromatogram(s)



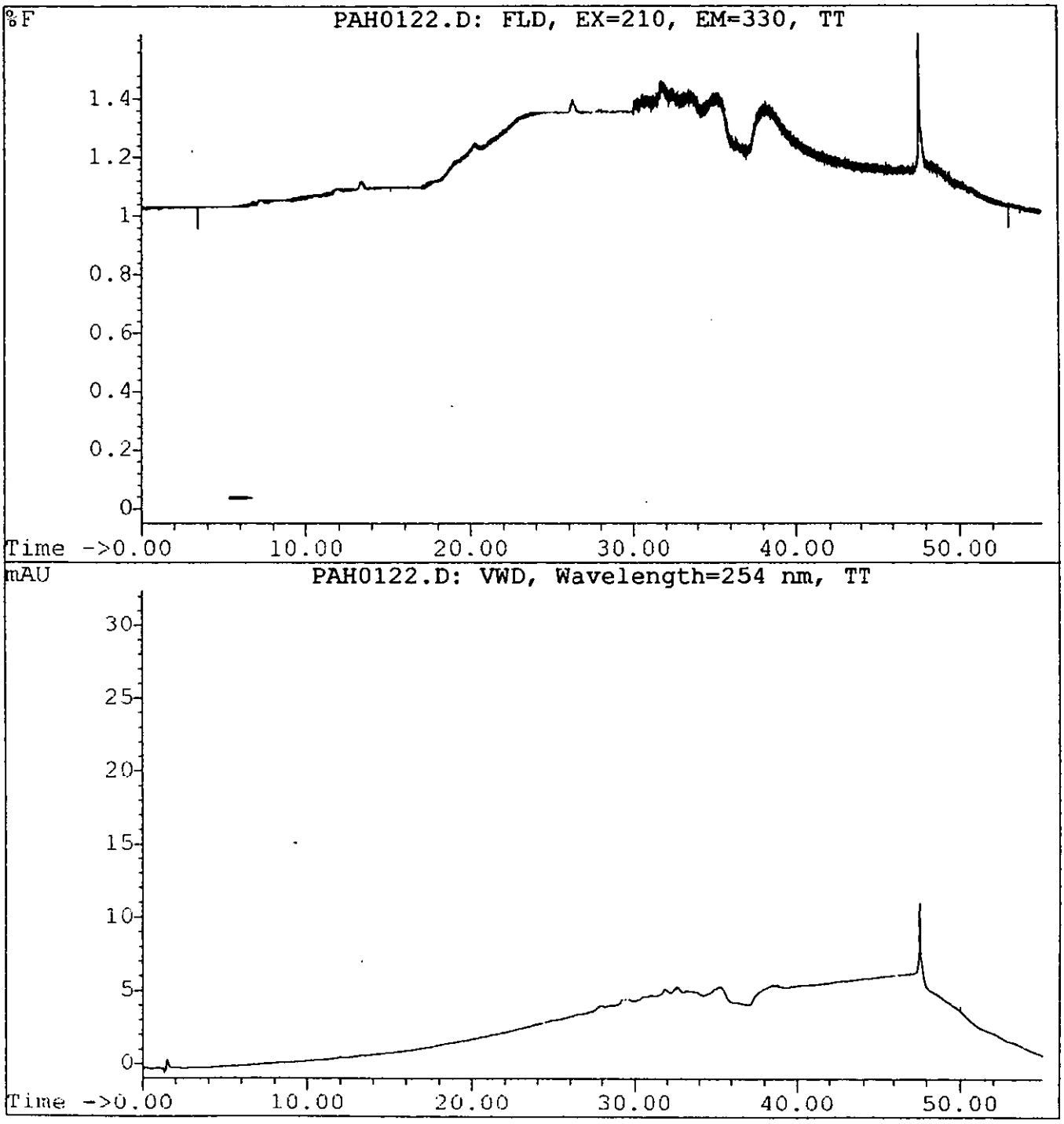


Tuesday, August 20, 1996 19:43:16 by suhana

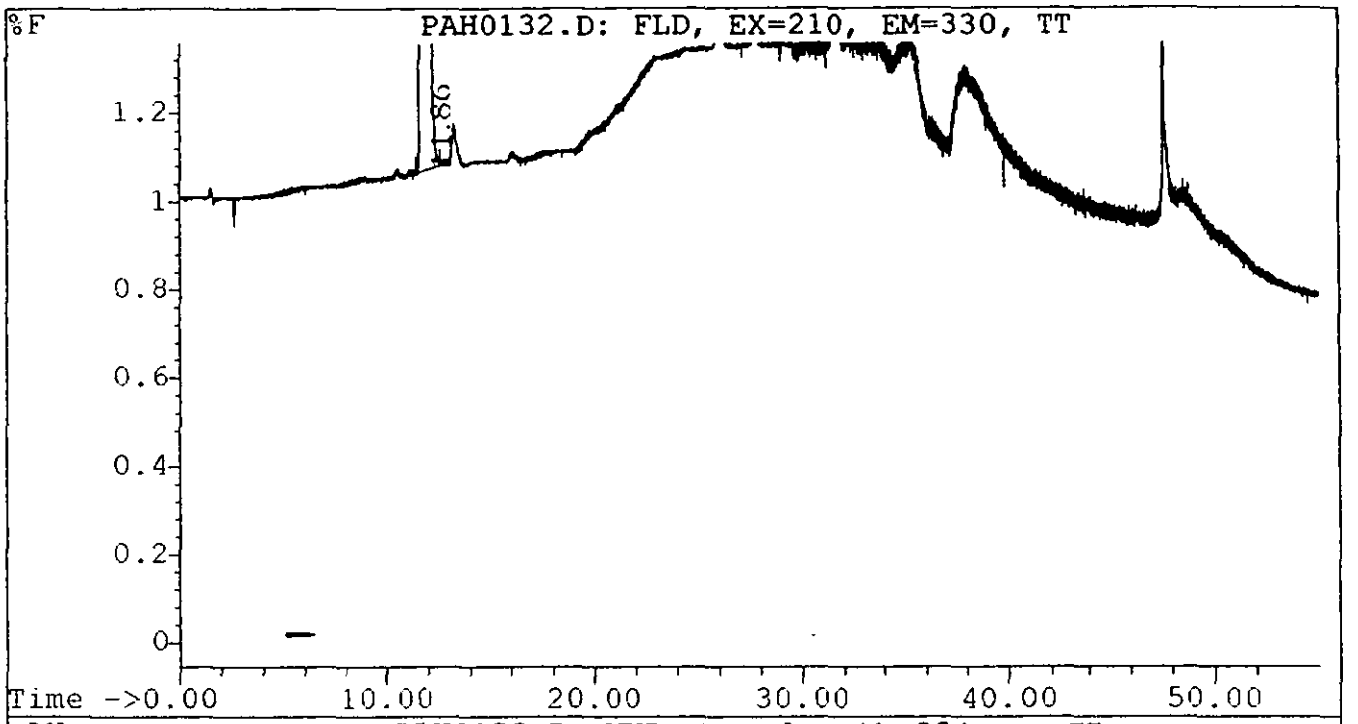
File: A:\PAH0121.D
Operator: suhana
Date Acquired: 17/9/96 15:23:28
Method File Name: SUPAHS.M
Sample Name: water
Misc Info:
Bottle Number: 1

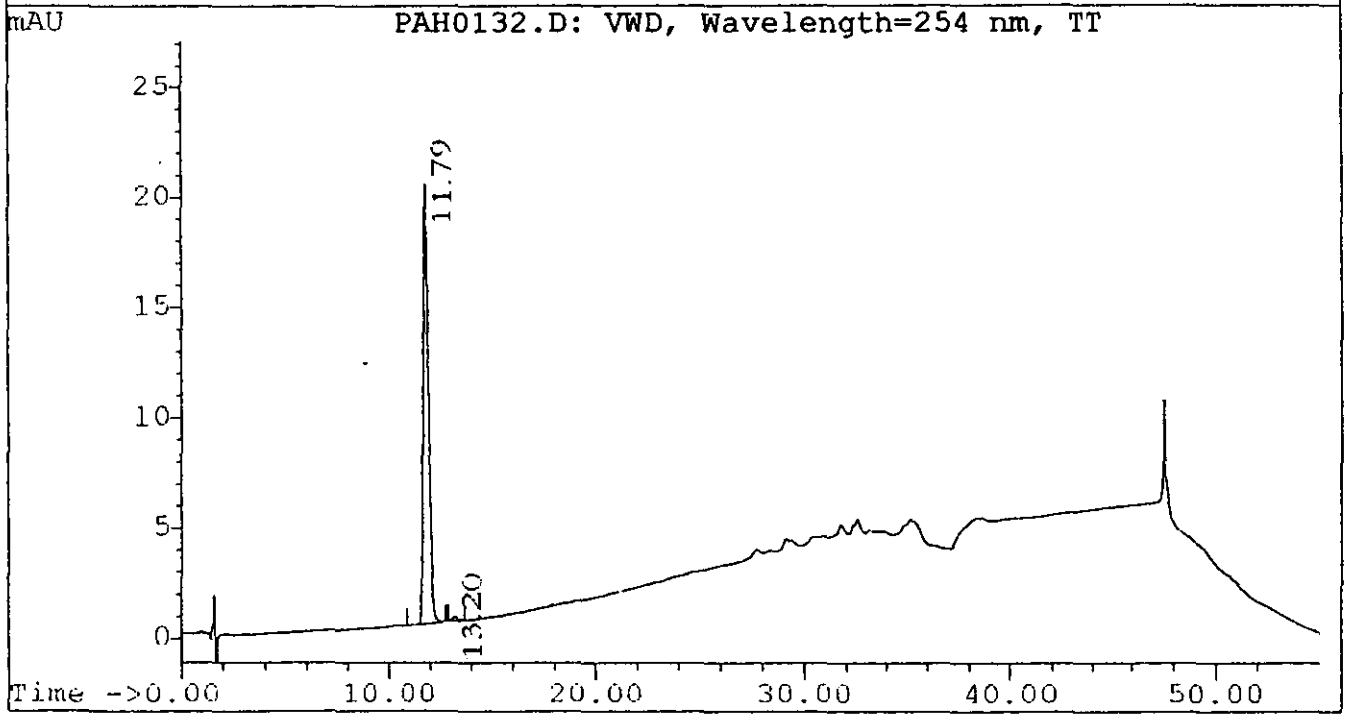


File: A:\PAH0122.D
Operator: suhana
Date Acquired: 17/9/96 16:22:48
Method File Name: SUPAHS.M
Sample Name: acn
Misc Info:
Bottle Number: 1

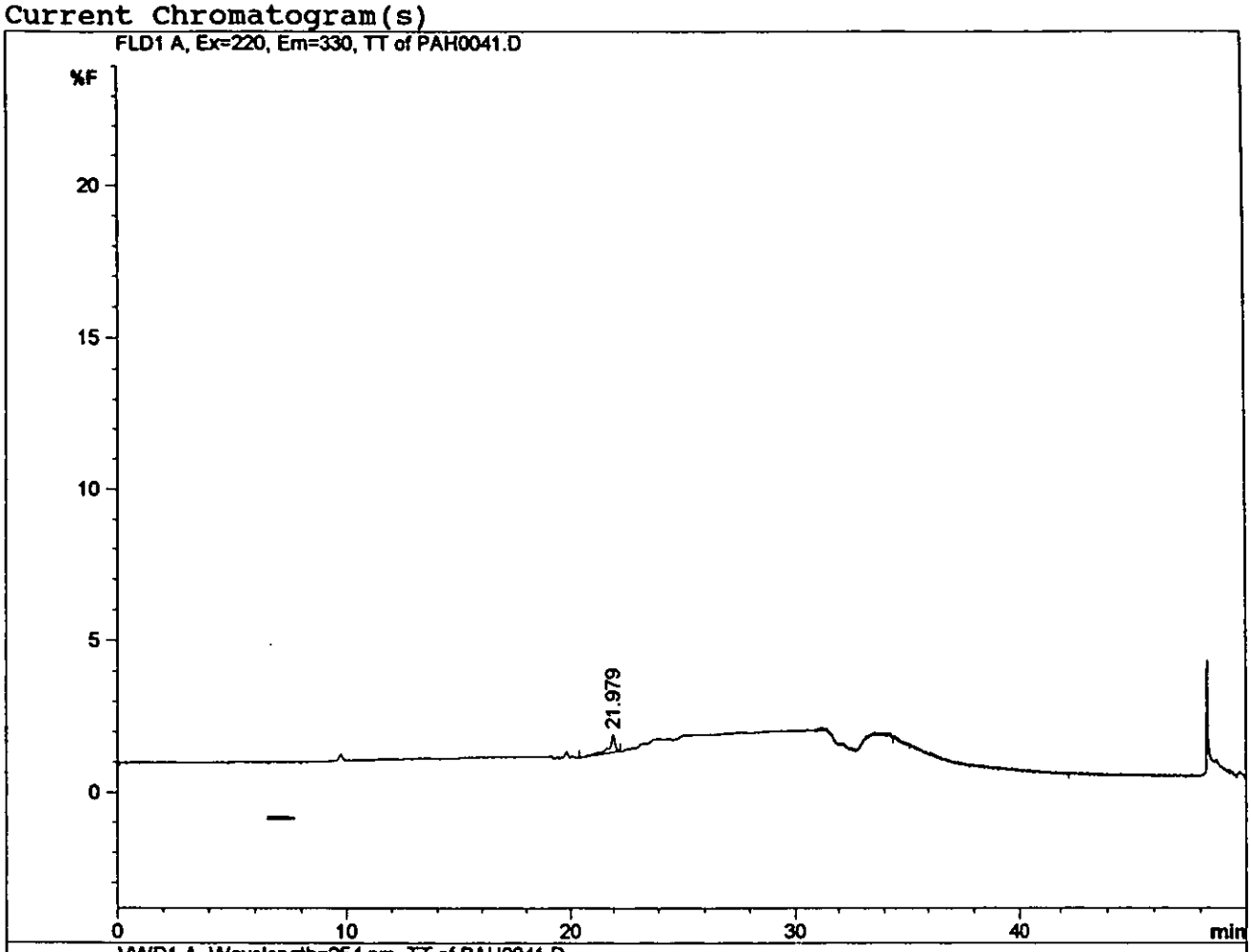


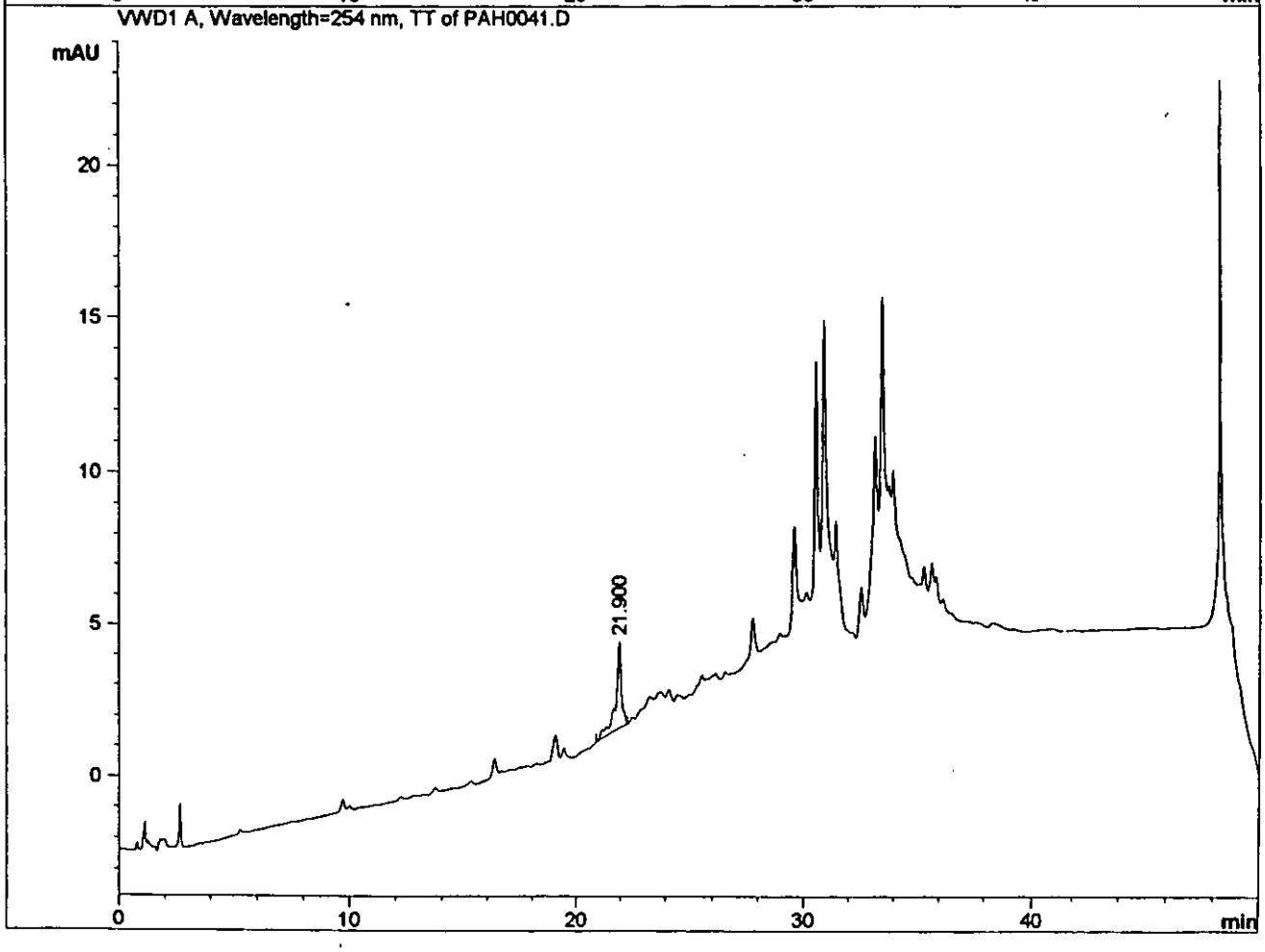
File: A:\PAH0132.D
Operator: suhana
Date Acquired: 18/9/96 17:06:41
Method File Name: SUPAHS.M
Sample Name: phenanthrene
Misc Info:
Bottle Number: 1





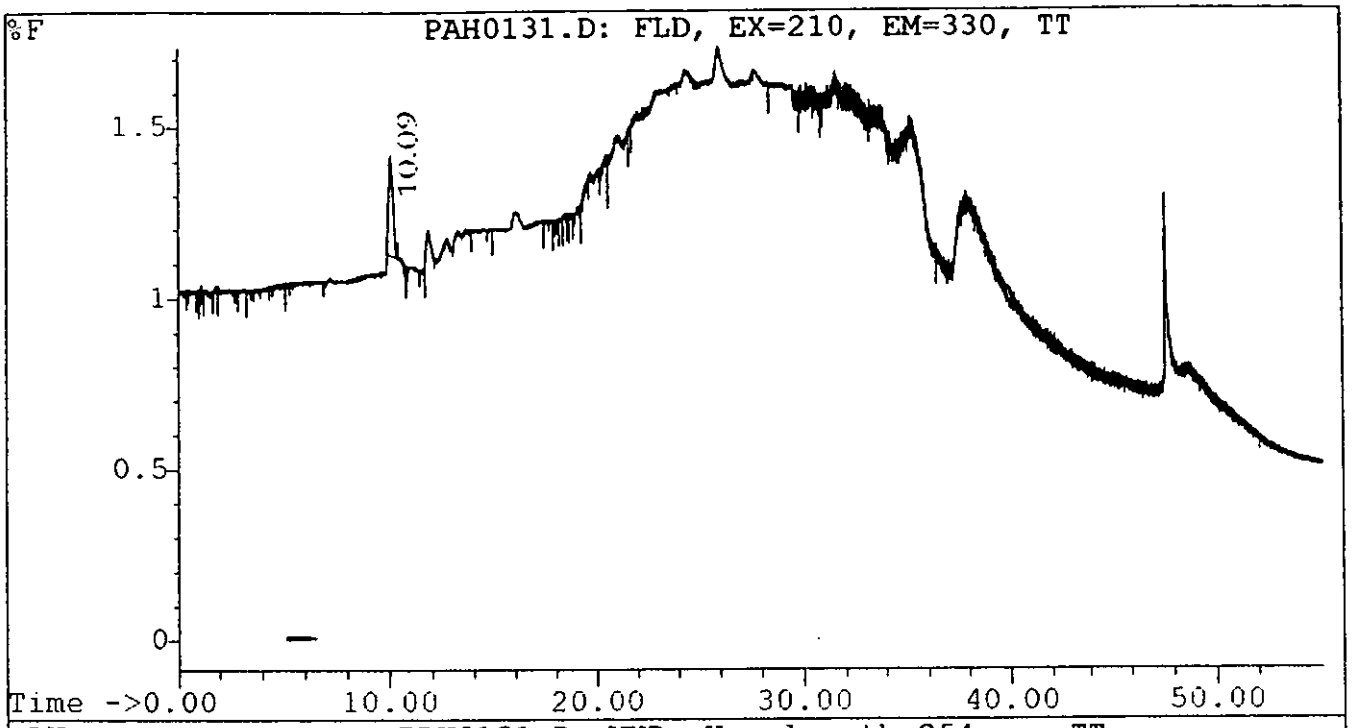
Current Chromatogram(s)

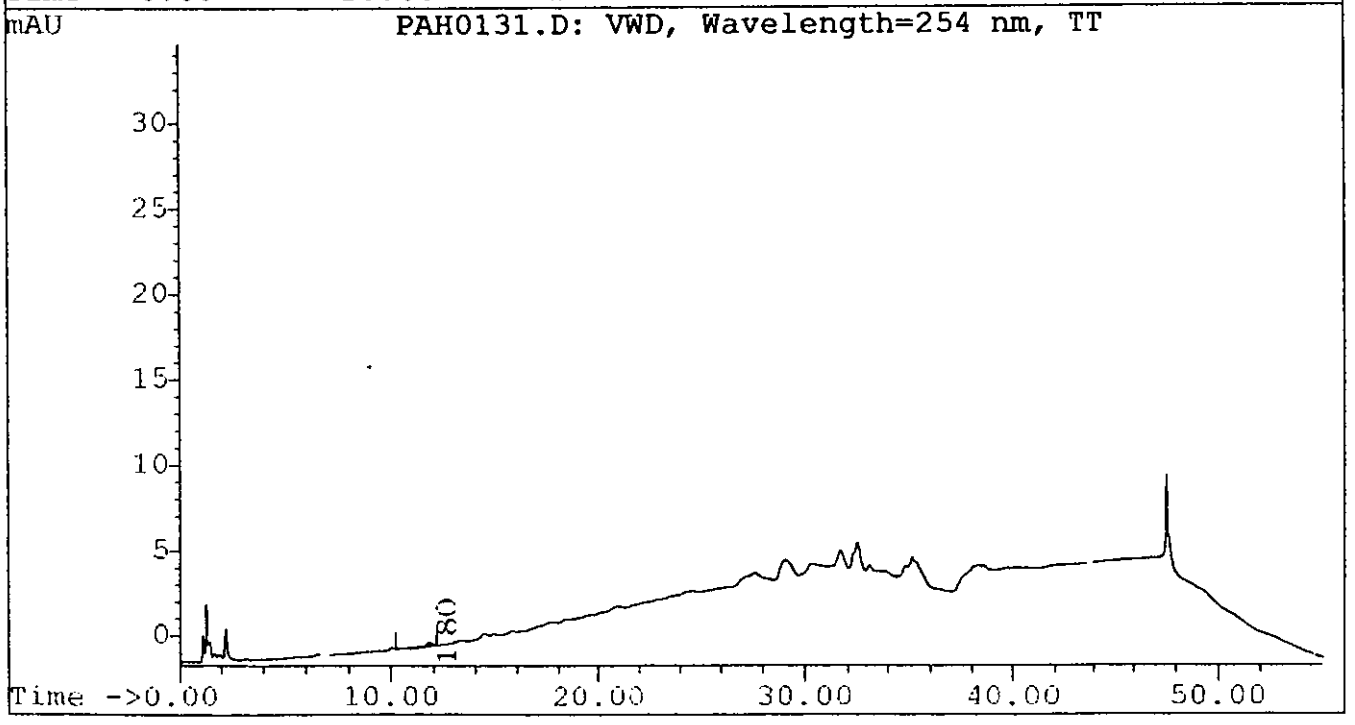




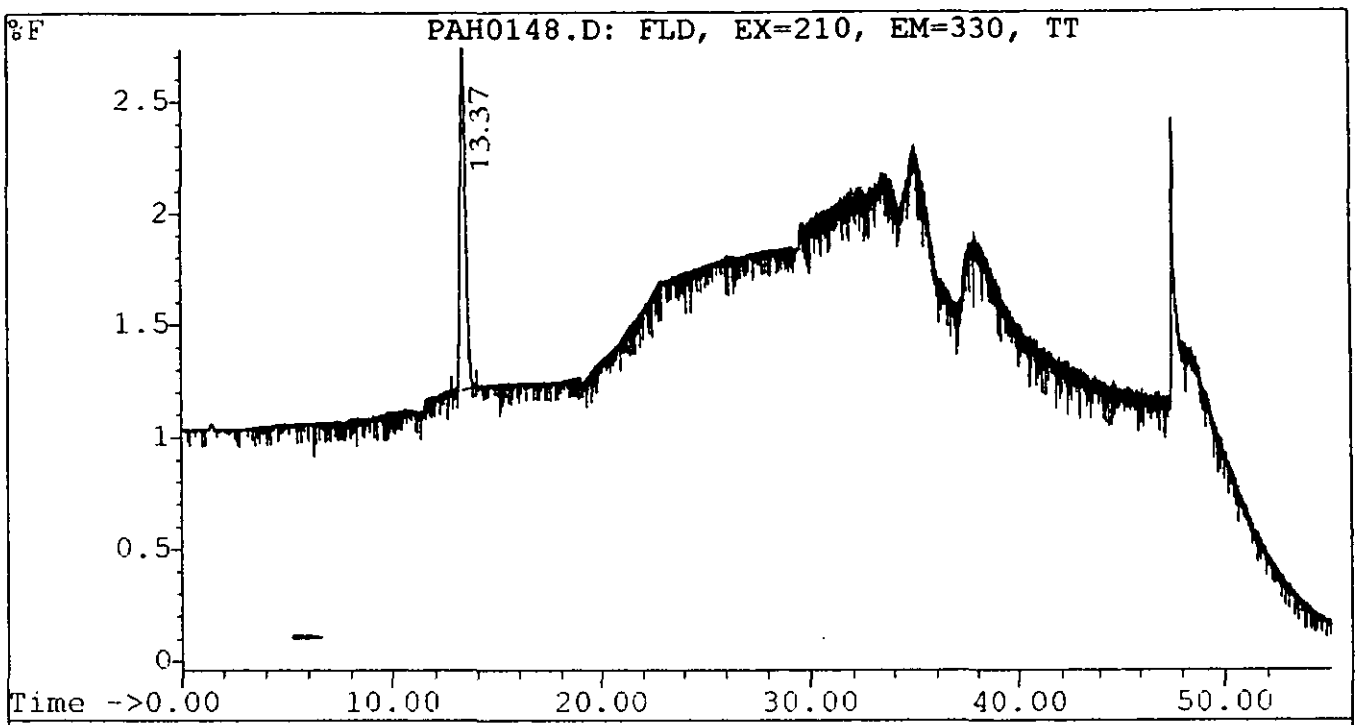
Wednesday, August 21, 1996 19:14:30 by suhana

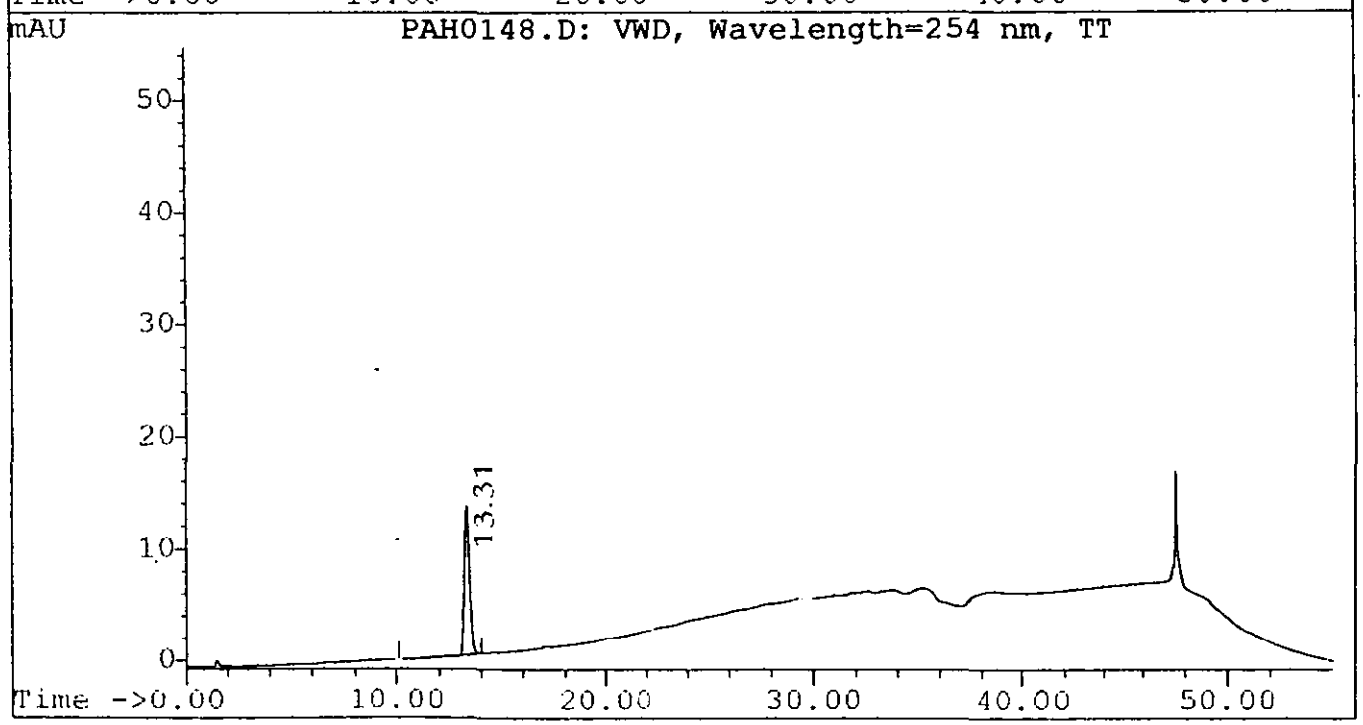
File: A:\PAH0131.D
Operator: suhana
Date Acquired: 18/9/96 15:57:22
Method File Name: SUPAHS.M
Sample Name: acenapthene
Misc Info:
Bottle Number: 1



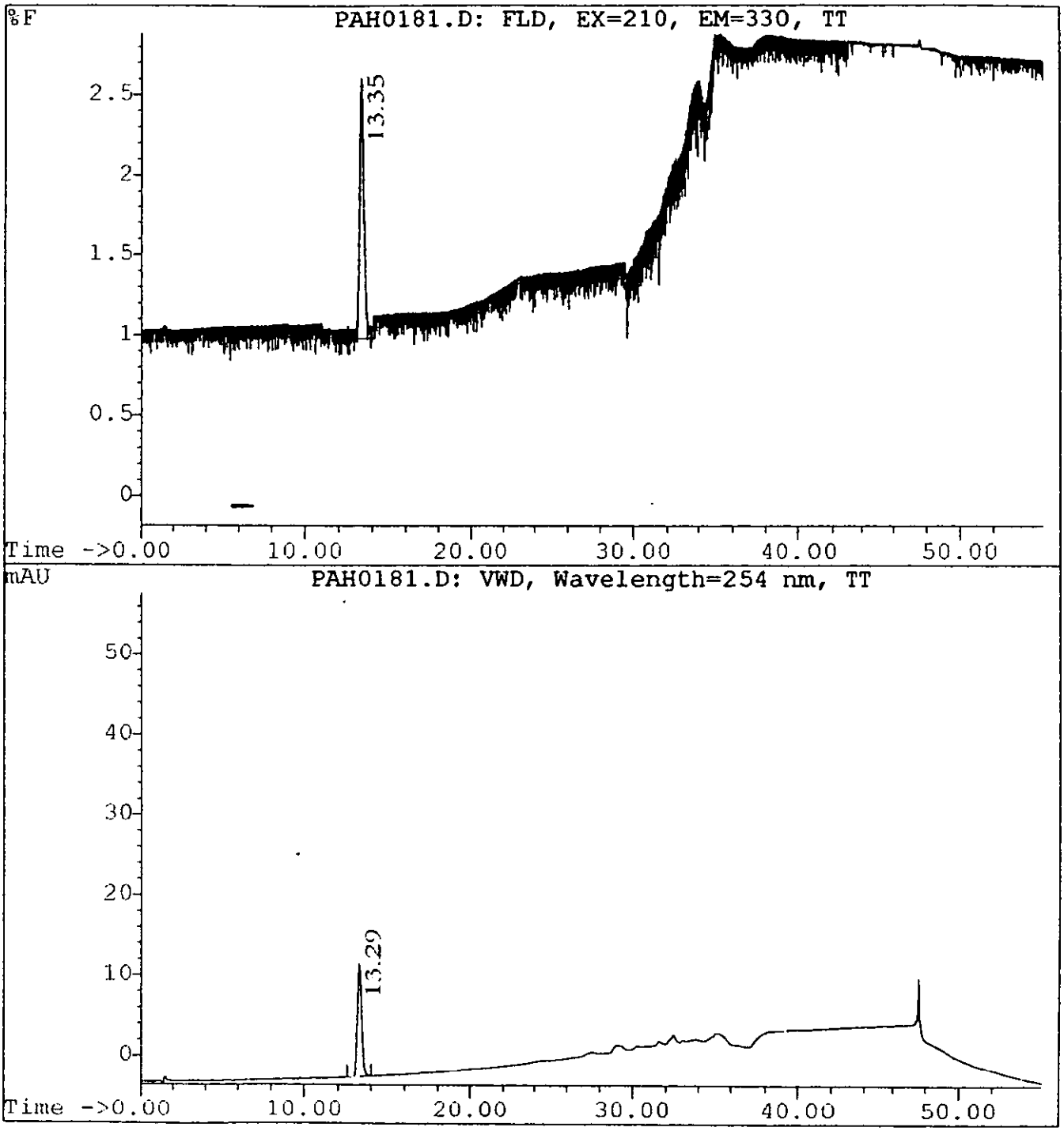


File: A:\PAH0148.D
Operator: suhana
Date Acquired: 20/9/96 16:19:17
Method File Name: SUPAHS.M
Sample Name: decaf40000
Misc Info:
Bottle Number: 1

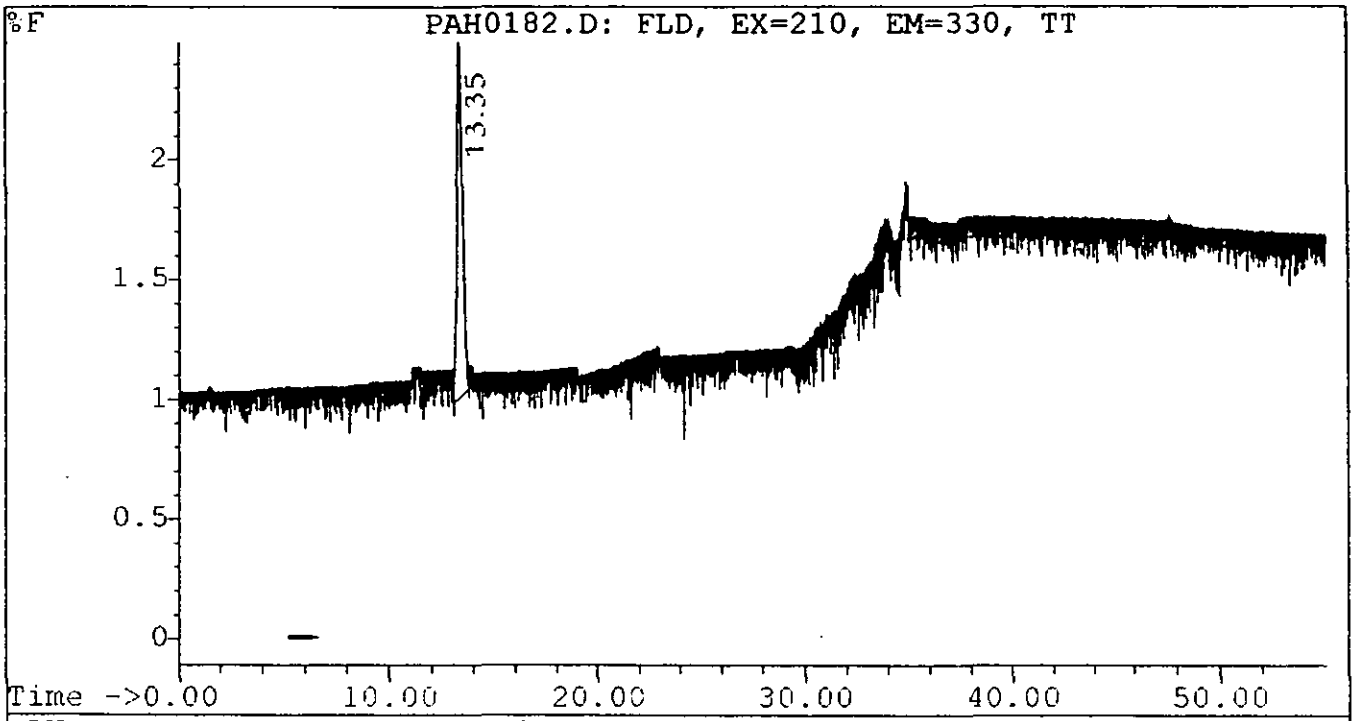


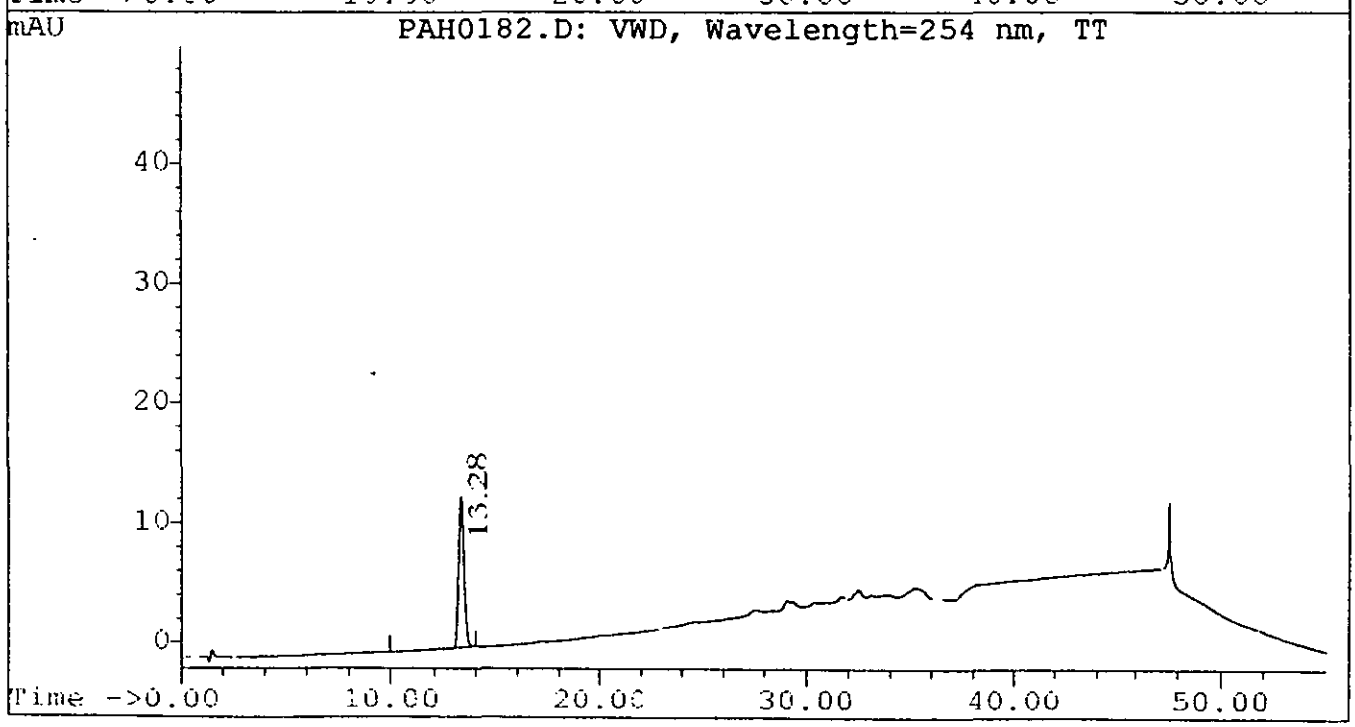


File: A:\PAH0181.D
Operator: suhana
Date Acquired: 27/9/96 14:24:47
Method File Name: SUPAHS.M
Sample Name: decaf 4000
Misc Info:
Bottle Number: 1



File: A:\PAH0182.D
Operator: suhana
Date Acquired: 27/9/96 15:49:07
Method File Name: SUPAHS.M
Sample Name: decaf 4000
Misc Info:
Bottle Number: 1

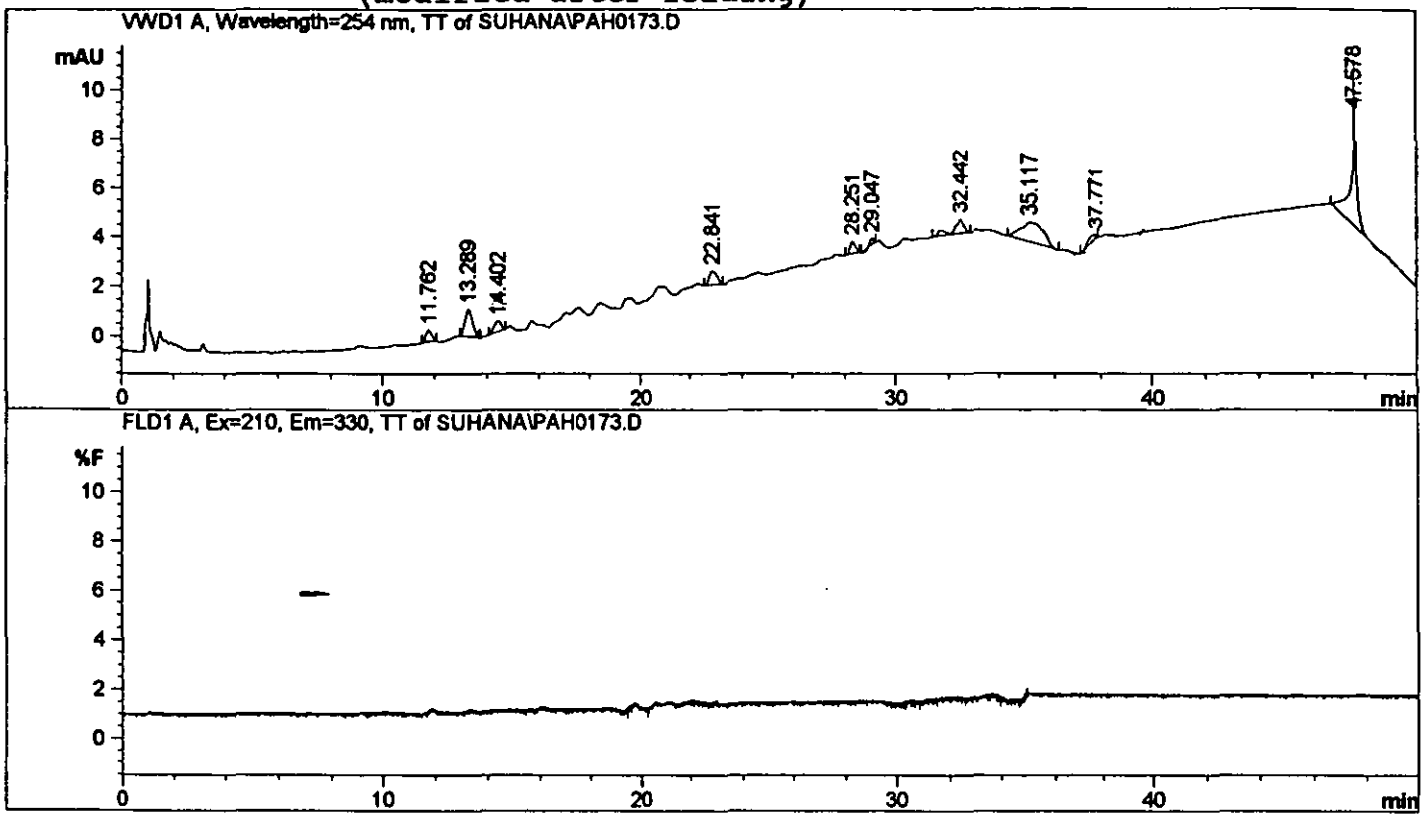




40,000 IS check for recovery

Acq. Method	: SUPAHS.M	Seq. Line	: -
Acq. Operator	: suhana	Vial	: 1
Injection Date	: 25/9/96 13:20:33	Inj	: -
Sample Name	: decaf in N	Inj Volume	: Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAHS.M
(modified after loading)



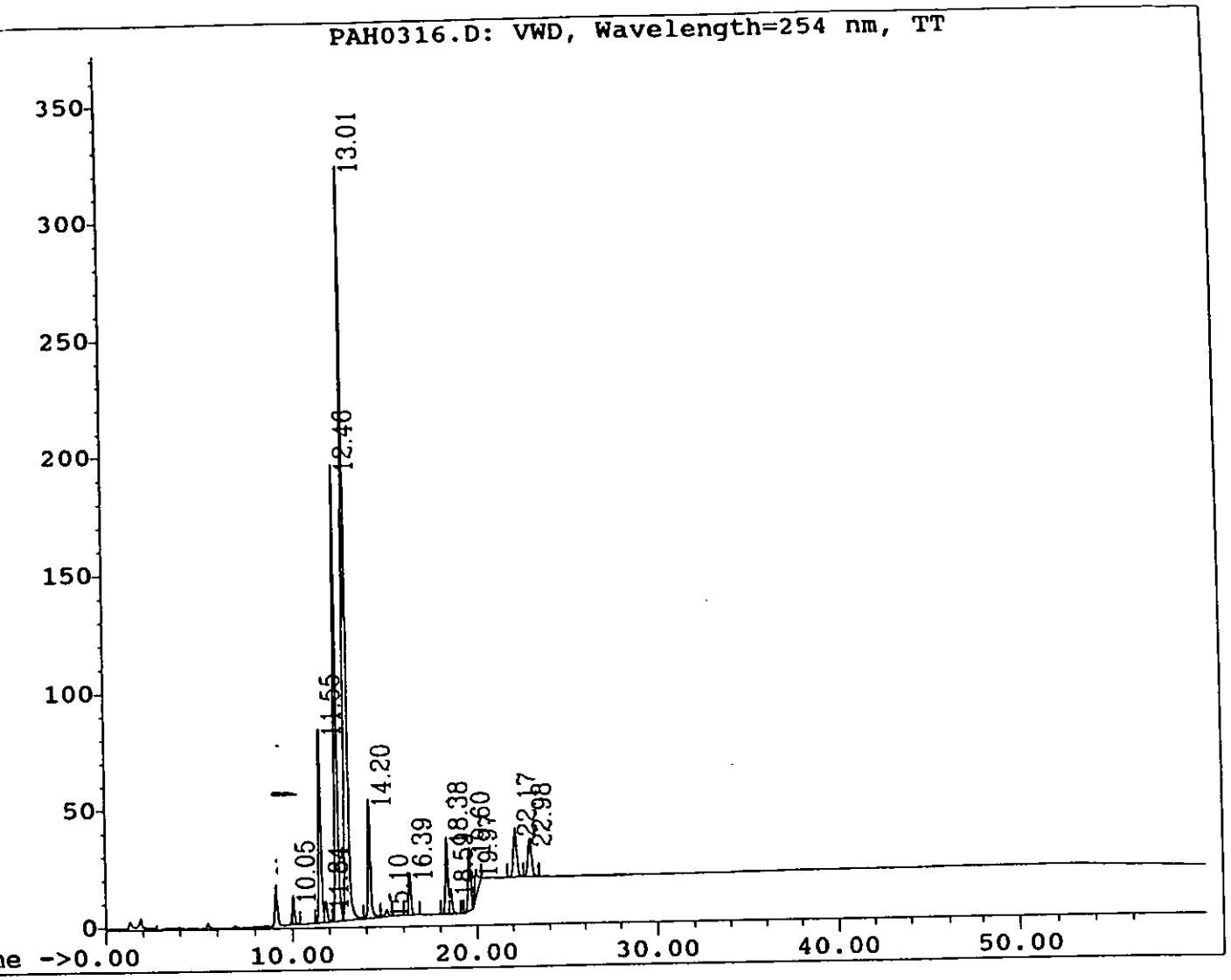
Area Percent Report

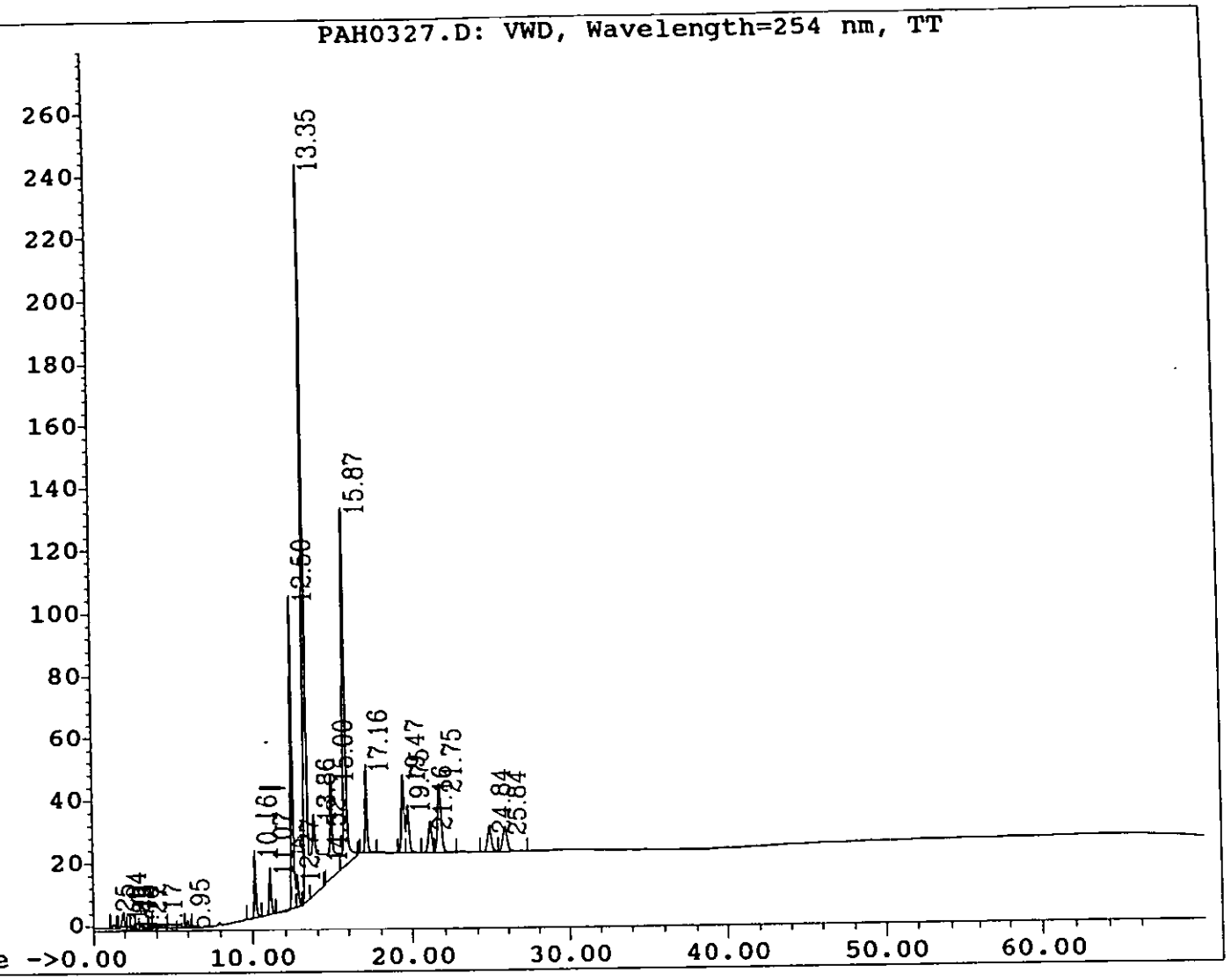
Sorted by Signal
Multiplier : 1.000000

Signal 1: VWD1 A, Wavelength=254 nm, TT

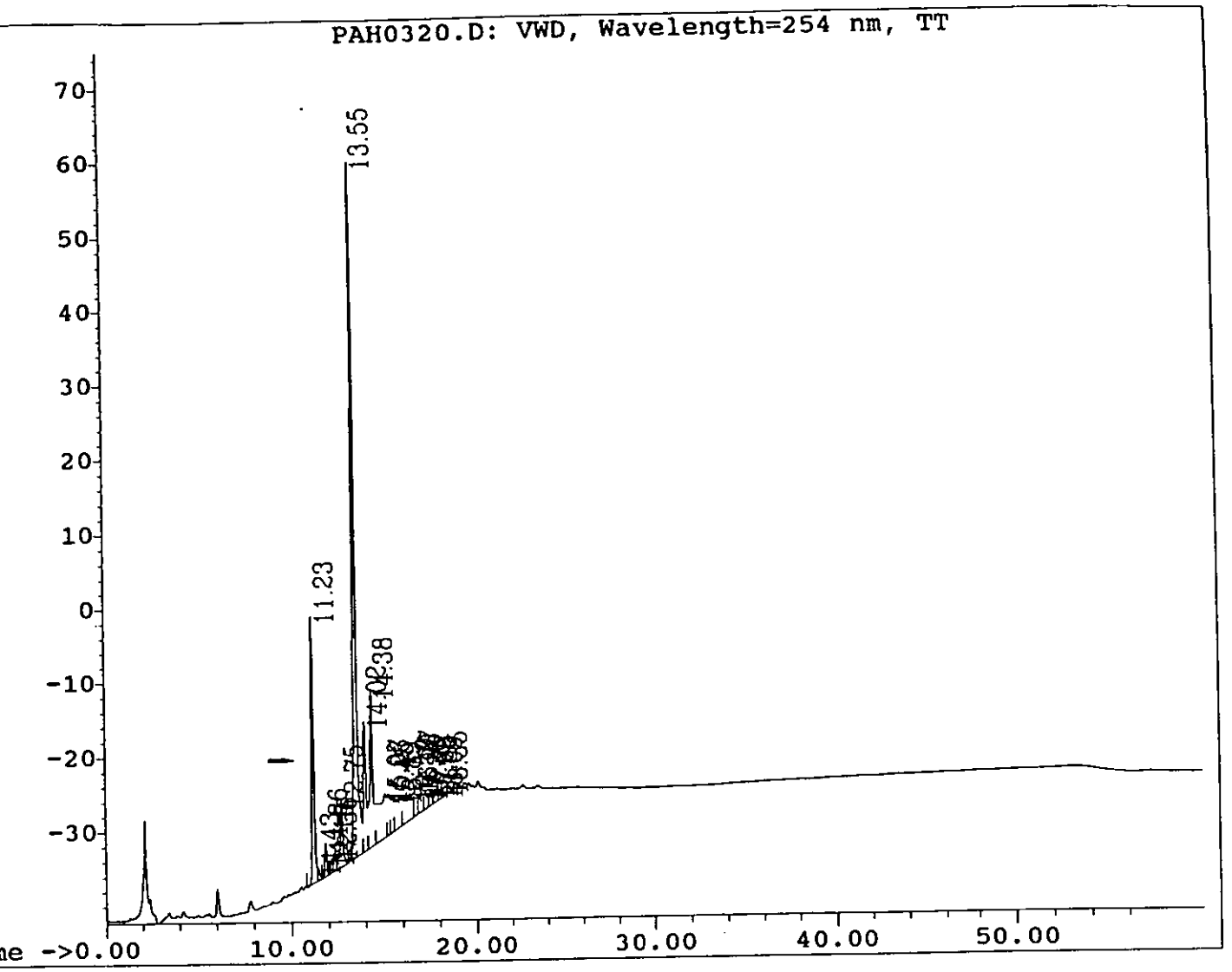
Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	11.762	BB	0.214	7.99342	4.87540e-1	3.8994
2	13.289	BB	0.246	21.47335	1.10064	10.4753
3	14.402	BB	0.236	8.11749	4.46043e-1	3.9599
4	22.841	BB	0.292	11.93889	5.57846e-1	5.8241
5	28.251	BB	0.229	7.83467	5.02630e-1	3.8220
6	29.047	BV	0.105	1.83327	2.56699e-1	0.8943
7	32.442	BB	0.390	18.46437	5.95281e-1	9.0075
8	35.117	BB	0.720	44.40422	8.10049e-1	21.6617
9	37.771	BB	0.521	7.05156	1.72321e-1	3.4400
10	47.578	BBA	0.144	75.87874	6.75412	37.0158
Totals :				204.98999	11.68316	

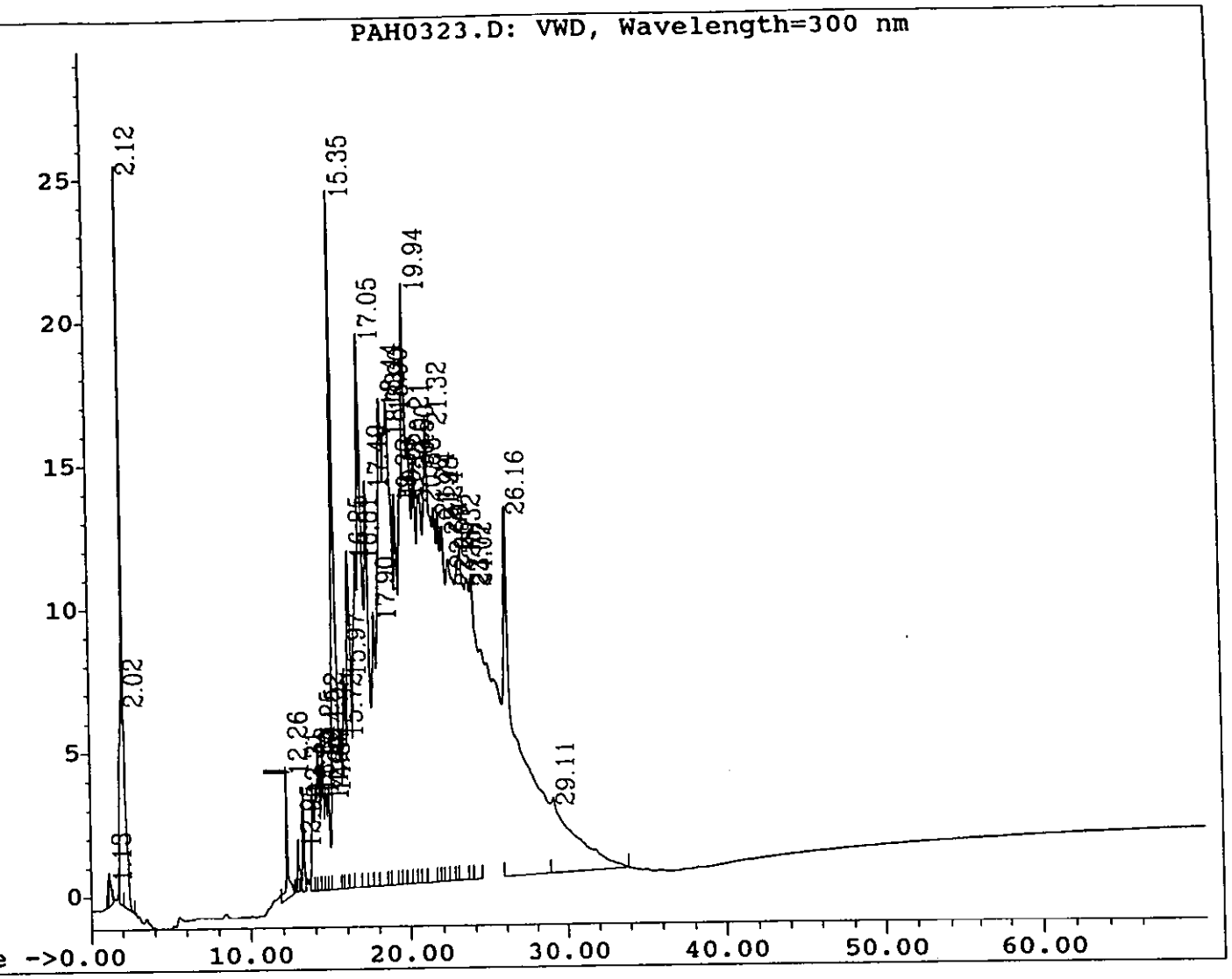
		Notes and Comments on Chromatograms
2	Chrom	**Method Development for UVD Sample Chromatograms**
		(Before the purchase of the FLD.)
	0316	GSDPah6. At T= 14.5, UV 350nm. Gradient Plateau at T=14.5. Std PAH
		Peaks no 8 and 9/10 vey low. Peaks 1-6 is well differentiated
	0327	GSDPah1. At T=13.5, UV 330 nm. Gradient Plateau at T= 20. Std PAH
		Loss in peak height for peak no 5 but peaks 8 is higher.
		9/10 slightly higher
	0320	GSDPah6. Sample?day 0. At t=14.5. Peaks are all very low.
	0323	GSDPah 9.Sample ? day 0. Tested a longer gradient and fixed wavelenght
		at 330nm. Peaks come of sharply from sloping gradient baseline
	0324	GSDPah1. Sample ? day 0. Better differentiated peaks than using GSDPah6
	0329	Based on GSDPah9, GSD Pah A , at T=11.5 UV330nm. sample ? day 0
		Higher late eluting peaks than GSDPah 6.
	0330	GSDPah A. Sample 5 (ie Sample ? Day 0 + Std PAH). Sharp gradient of
		baseline is much reduced due to the higher PAH amounts.
		Well differentiated peaks


PAH0316.D: VWD, Wavelength=254 nm, TT
350
300
250
200
150
100
50
0
13.01
12.40
11.55
14.20
10.05
16.39
22.98
22.17
10.00
20.00
30.00
40.00
50.00

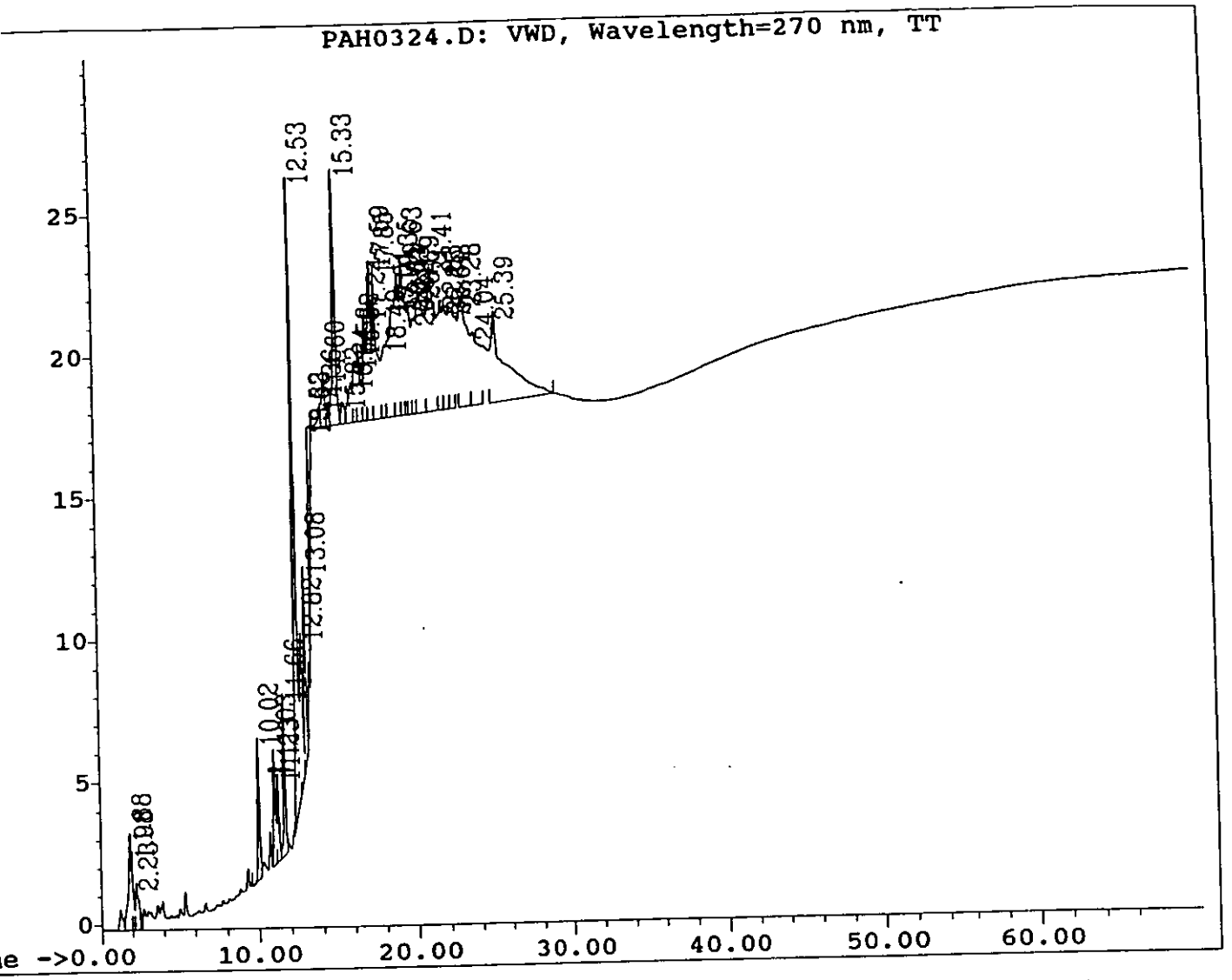

PAH0327.D: VWD, Wavelength=254 nm, TT
260
240
220
200
180
160
140
120
100
80
60
40
20
0
13.35
15.87
12.50
17.16
18.00
19.47
21.75
24.84
25.84
5.95
->0.00
10.00
20.00
30.00
40.00
50.00
60.00

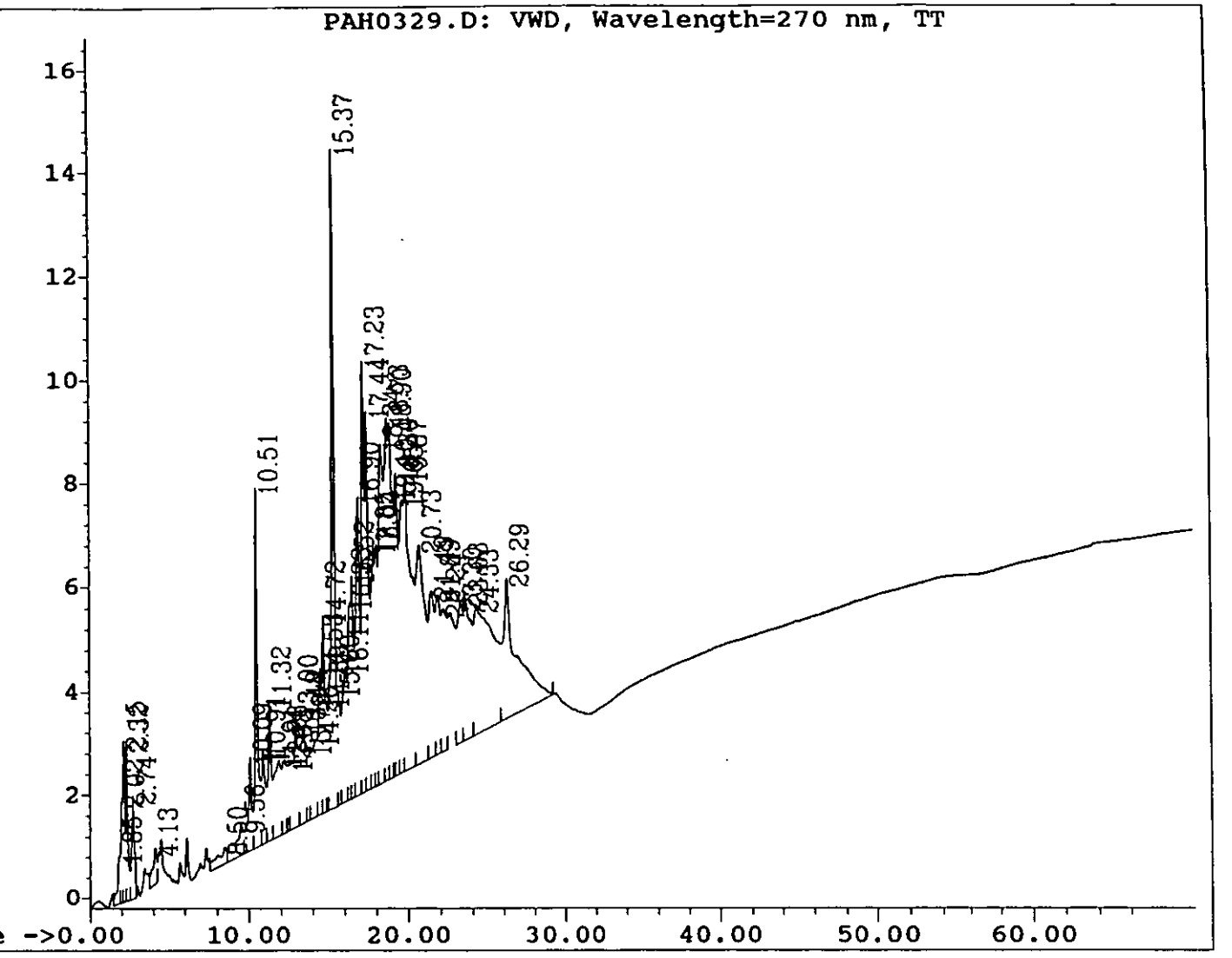
Mon Mar 20 17:55:55 1995

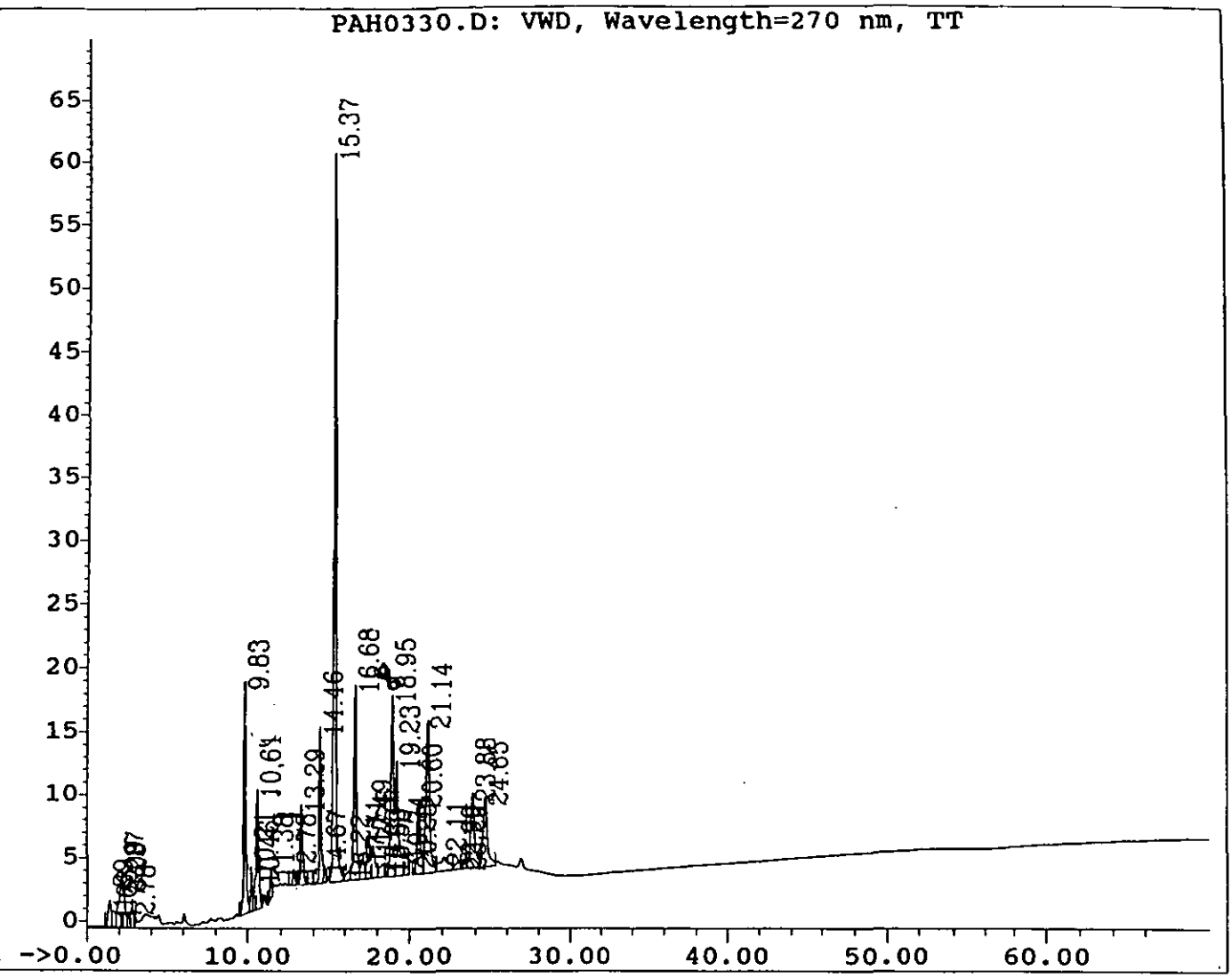



PAH0323.D: VWD, Wavelength=300 nm
25
20
15
10
5
0
2.12
15.35
19.94
17.05
21.32
26.16
2.02
29.11
1.13
->0.00
10.00
20.00
30.00
40.00
50.00
60.00

Tue Mar 21 10:13:11




PAH0329.D: VWD, Wavelength=270 nm, TT
16
14
12
10
8
6
4
2
0
15.37
10.51
17.23
26.29
->0.00
10.00
20.00
30.00
40.00
50.00
60.00

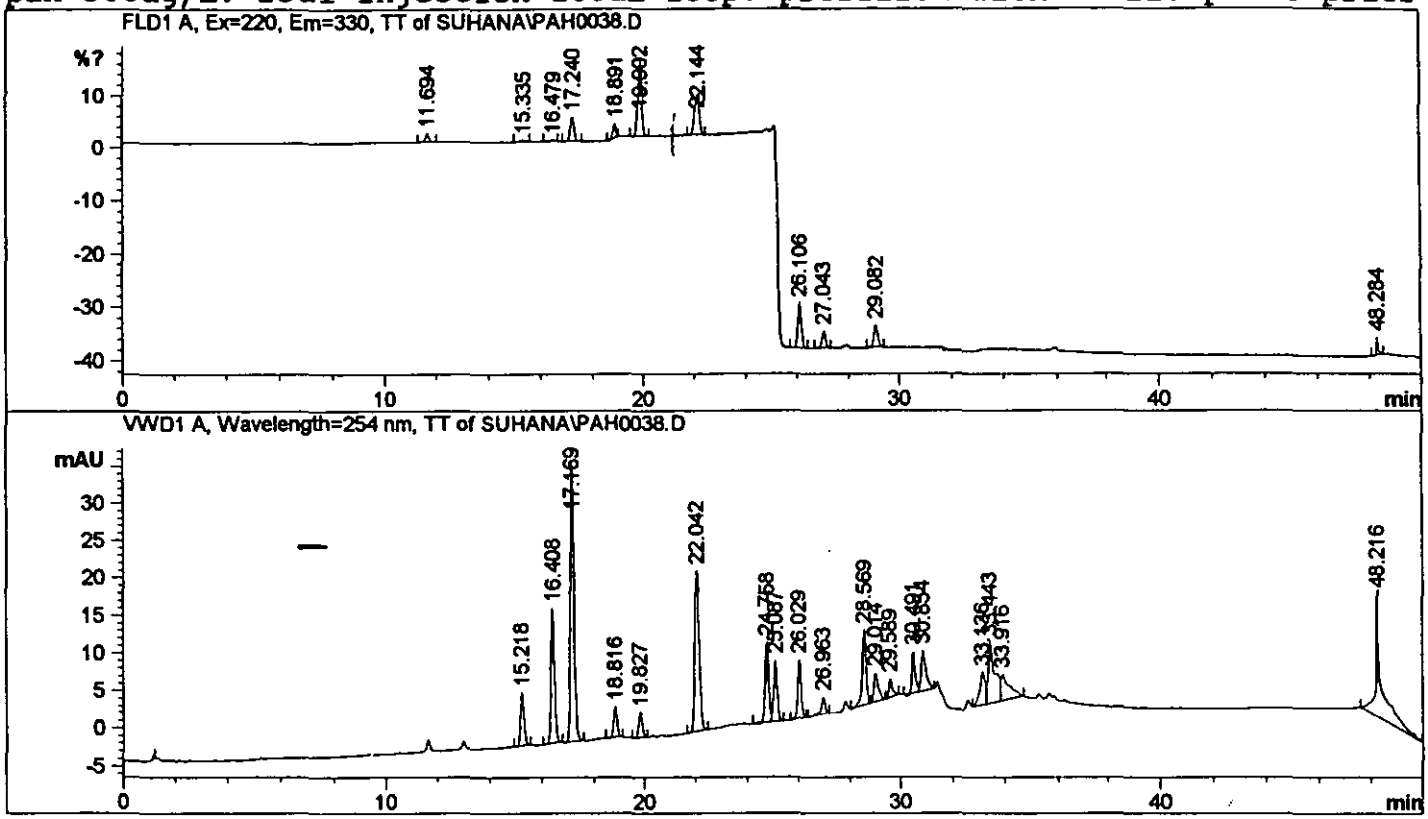

PAH0330.D: VWD, Wavelength=270 nm, TT
65
60
55
50
45
40
35
30
25
20
15
10
5
0
->0.00
10.00
20.00
30.00
40.00
50.00
60.00
15.37
9.83
16.68
14.46
18.95
21.14
19.23
10.61
13.29
24.85

		Notes and Comments on Chromatograms
3	**Chrom.**	**Method development . FLD time table**
	0038	Based on British Gas method. Chrom. used to help
		reset FLD TT
	0048	APHA method. On autointegrate peaks are not all integrated.
		Chrom used to produce new FLD TT . First peak eluted late.
	0033	UVD maintained at 254nm to assist development of TT for FLD
	0044-0045	Some of Chrom. trying different exitation and emmision
		wavelength changes
	0046	To help resolve peaks, a gradient hold was tried.
	0050	FLD and UVD TT change to suit solvent gradient change.
		Testing PMT changes.
	0051-0052	PMT changes
	0059	Changed FLD TT has helped resolve peaks 5 and 7 and
		peaks 11 and 12 higher
	0061	Approaching a desired separation. Good resolution and
		no baseline jumping only 2 PMT, early one at 7 and to
		enhance late peak detection, PMT at 11
	0065	Final FLD TT as attached. UVD set at 254. With the Lichros
		column, peak no9 and 10 are not resolved.
	0095	Column check after short break. Small time drift noted.
	0110	Phenomenax column.TT adjusted accordingly
		Separation achieved for Peak 9 and 10

25ul sample size

Acq. Method	: SUPAH3.M	Seq. Line	: -
Acq. Operator	: suhana	Vial	: 1
Injection Date	: 21/8/96 12:09:00	Inj	: -
Sample Name	: pah	Inj Volume	: Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAH3.M
(modified after loading)
pah 500ug/L. 25ul injection 100uL loop. prefilled with mobile phase prior



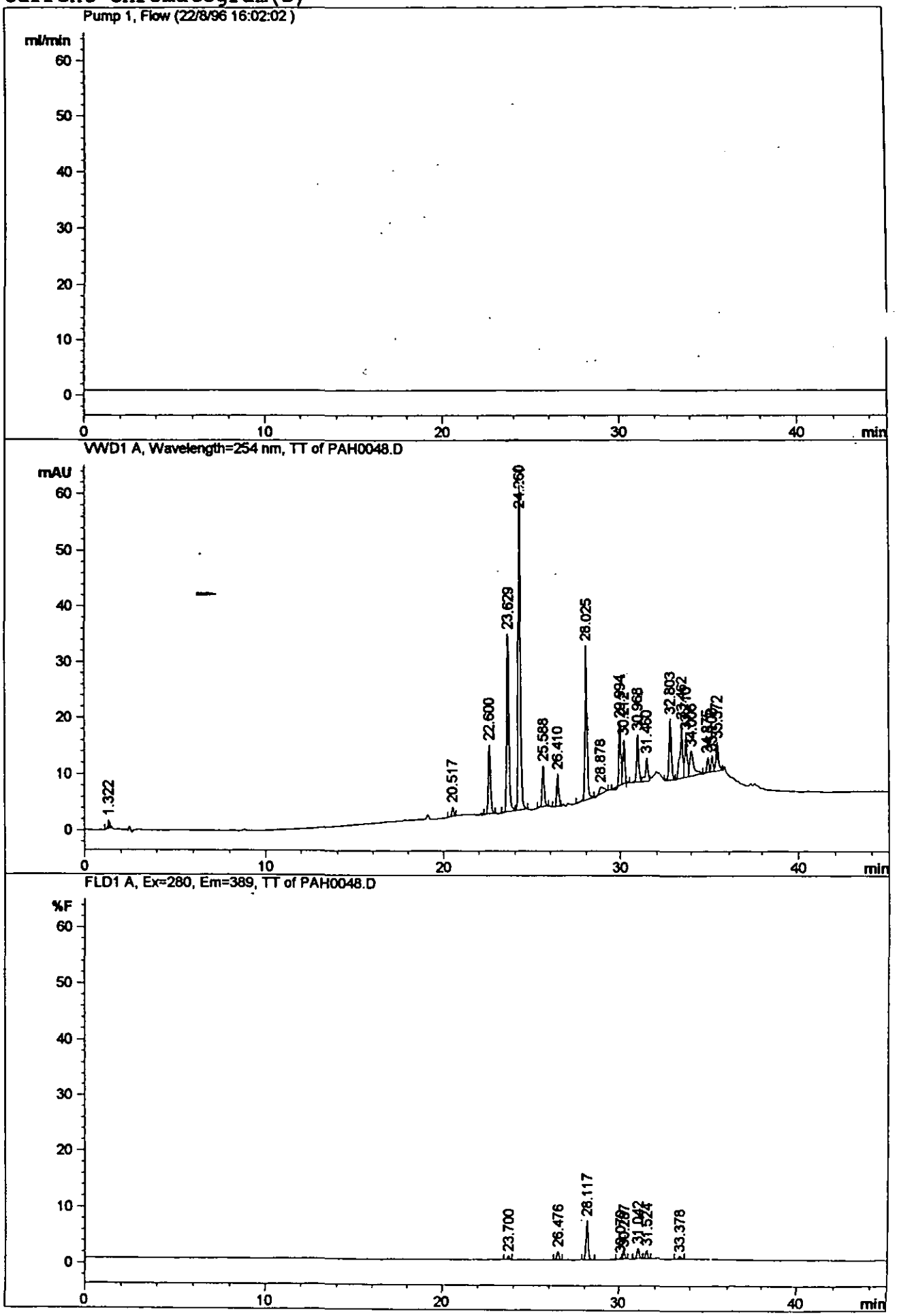
Area Percent Report

Sorted by Signal
Multiplier : 1.000000

Signal 1: FLD1 A, Ex=220, Em=330, TT

Peak #	RT [min]	Type	Width [min]	Area [%F*sec]	Height [%F]	Area %
1	11.694	BB	0.145	14.99598	1.60097	2.8854
2	15.335	BB	0.195	4.23916	3.13490e-1	0.8157
3	16.479	BB	0.150	3.31142	3.39015e-1	0.6372
4	17.240	BB	0.156	46.83145	4.64910	9.0111
5	18.891	BB	0.137	22.97851	2.76400	4.4214
6	19.902	BB	0.164	152.73744	14.36484	29.3889
7	22.144	BB	0.198	100.39323	7.84510	19.3171
8	26.106	BB	0.155	83.41830	8.42630	16.0509
9	27.043	BB	0.152	30.89807	3.11736	5.9452
10	29.082	BB	0.167	45.03777	4.13549	8.6659
11	48.284	BB	0.102	14.86974	3.24844	2.8612
Totals :				519.71106	50.80408	

Current Chromatogram(s)



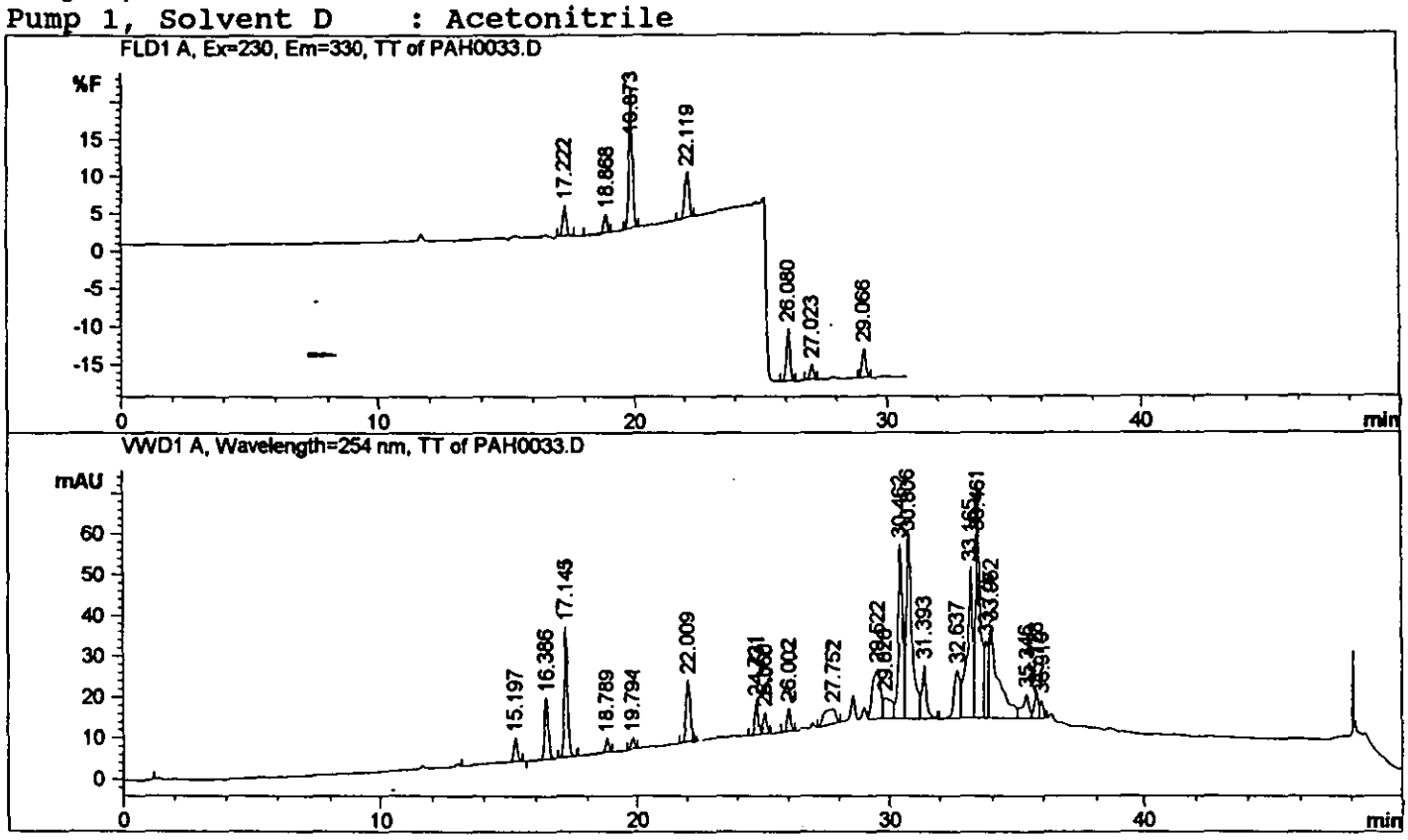
Thursday, August 22, 1996 16:53:21 by suhana

```
Acq. Method       : SUPAH3.M                          Seq. Line :  -
Acq. Operator     : suhana                              Vial :  1
Injection Date    : 20/8/96 17:44:56                     Inj :  -
Sample Name       : pah                           Inj Volume : Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAH3.M
                  (modified after loading)
PAH SU STD EPA. 1000ug/l newly  prepared mixed std. GsdPah.2 A 500ul samp
```

Instrument Conditions:	At Start	At Stop	
Temperature:	38.0	38.0	°C
Pressure:	127.6	100.1	bar
Flow:	1.0	1.0	ml/min

Solvent Description :
Pump 1, Solvent A : water
Pump 1, Solvent D : Acetonitrile



Area Percent Report

Sorted by Signal
Multiplier : 1.000000

Signal 1: FLD1 A, Ex=230, Em=330, TT

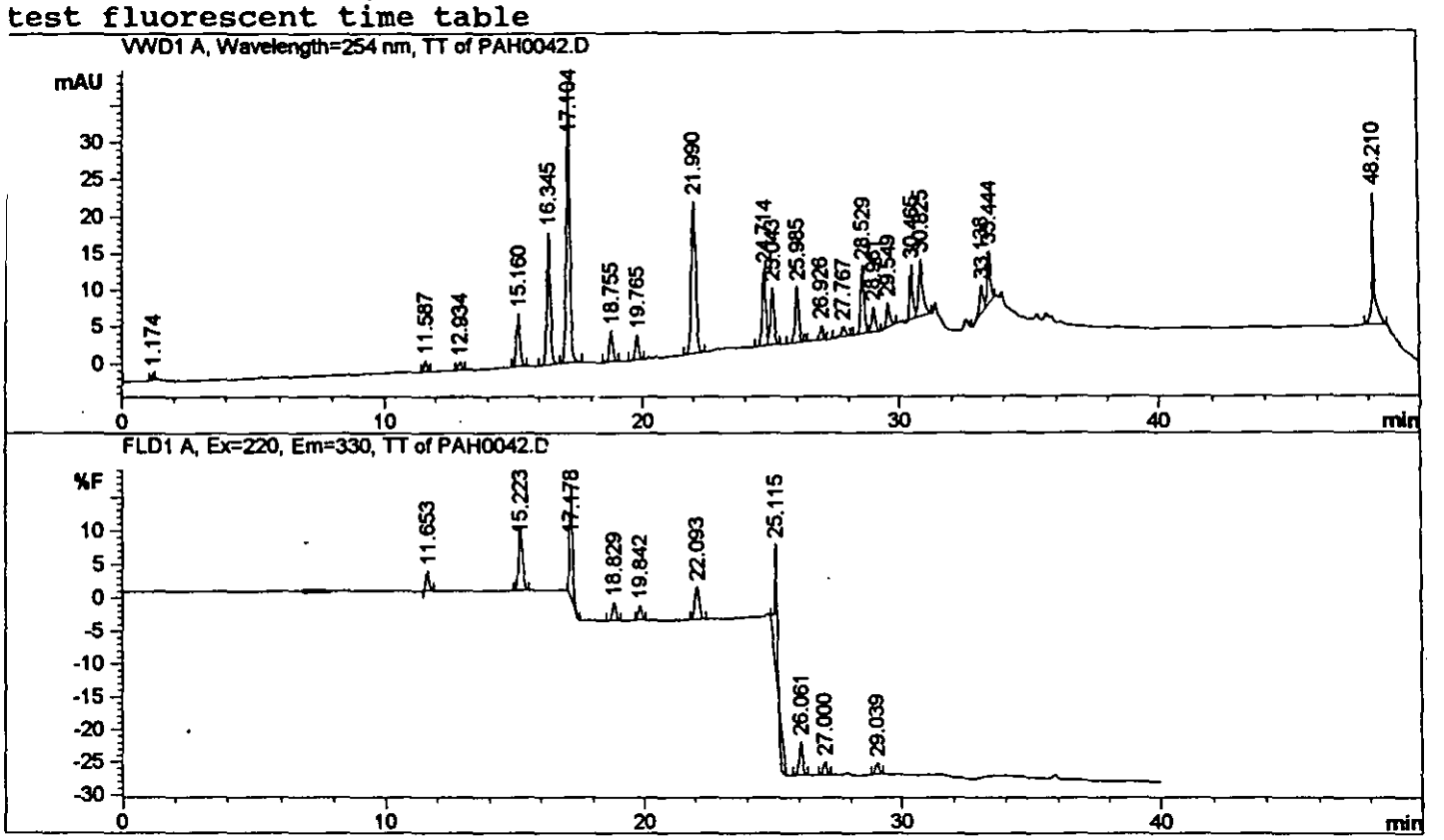
Peak #	RT [min]	Type	Width [min]	Area [%F*sec]	Height [%F]	Area %
1	17.222	VV	0.152	42.42313	4.12294	9.1542
2	18.868	PB	0.111	16.91489	2.49353	3.6499
3	19.873	BB	0.164	197.87662	18.88840	42.6983
4	22.119	BB	0.177	77.07315	6.07531	16.6310
5	26.080	BB	0.152	69.84219	6.93017	15.0707

!5 ul. loop prefilled.

==========

Acq. Method	: SUPAH4.M	Seq. Line	: -
Acq. Operator	: suhana	Vial	: 1
Injection Date	: 21/8/96 18:39:09	Inj	: -
Sample Name	: pah	Inj Volume	: Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAH5.M
(modified after loading)
test fluorescent time table



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Area Percent Report

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Sorted by Signal
Multiplier : 1.000000

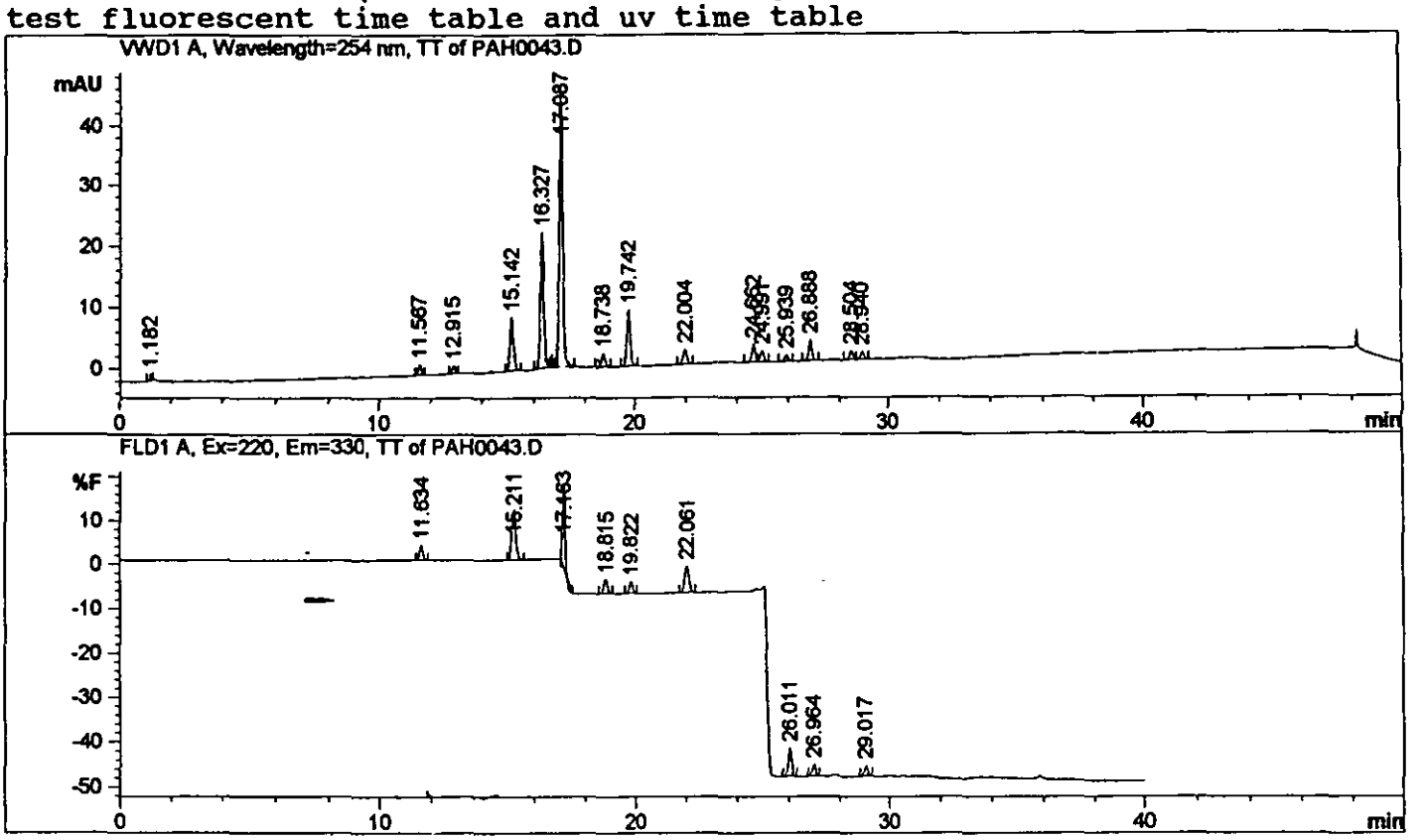
Signal 1: VWD1 A, Wavelength=254 nm, TT

Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	1.174	BV	0.050	3.30093	9.46252e-1	0.1863
2	11.587	BB	0.128	12.24193	1.51445	0.6908
3	12.934	BB	0.129	8.95514	1.07300	0.5053
4	15.160	BB	0.146	68.50244	7.18024	3.8656
5	16.345	BB	0.146	172.43730	18.16108	9.7305
6	17.104	BB	0.147	359.26257	37.73443	20.2730
7	18.755	BB	0.149	40.01743	4.17133	2.2582
8	19.765	BB	0.153	33.86726	3.44278	1.9111
9	21.990	BB	0.193	252.68510	20.74088	14.2589
10	24.714	BV	0.150	102.59625	10.57971	5.7894
11	25.043	VB	0.151	76.13252	7.79912	4.2961
12	25.985	BB	0.149	73.77838	7.66970	4.1633
13	26.926	BB	0.145	19.07965	2.03114	1.0767

25 ul. loop prefilled.

Acq. Method	: SUPAH5.M	Seq. Line	: -
Acq. Operator	: suhana	Vial	: 1
Injection Date	: 21/8/96 19:46:14	Inj	: -
Sample Name	: pah	Inj Volume	: Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAH5.M
(modified after loading)
test fluorescent time table and uv time table



Area Percent Report

Sorted by Signal
Multiplier : 1.000000

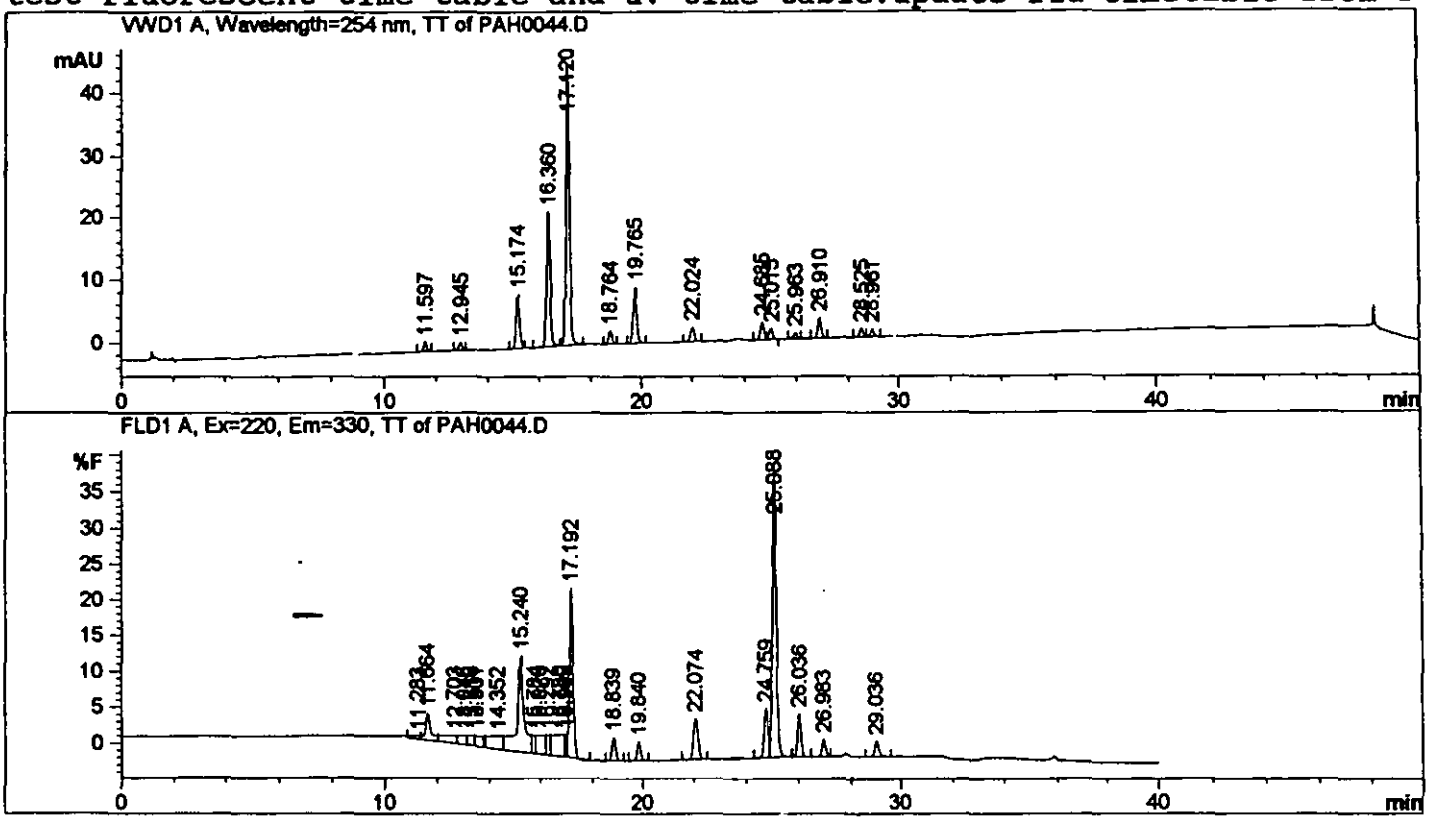
Signal 1: VWD1 A, Wavelength=254 nm, TT

Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	1.182	BB	0.050	3.87688	1.10196	0.3806
2	11.567	BB	0.125	14.20128	1.74947	1.3942
3	12.915	BB	0.130	10.94973	1.30558	1.0750
4	15.142	BB	0.145	83.64879	8.75329	8.2124
5	16.327	BB	0.145	209.70706	22.23208	20.5885
6	17.087	BB	0.147	438.56412	46.06128	43.0572
7	18.738	BB	0.150	21.16466	2.19240	2.0779
8	19.742	BB	0.155	92.51349	9.21989	9.0828
9	22.004	BB	0.169	26.23868	2.40516	2.5761
10	24.662	BV	0.152	29.03688	2.94215	2.8508
11	24.991	VB	0.152	18.16978	1.83535	1.7839
12	25.939	BB	0.148	10.37760	1.08087	1.0188
13	26.888	BB	0.146	31.99008	3.39718	3.1407

25 ul. loop prefilled.

Acq. Method	: SUPAH6.M	Seq. Line	: -
Acq. Operator	: suhana	Vial	: 1
Injection Date	: 21/8/96 20:45:21	Inj	: -
Sample Name	: pah	Inj Volume	: Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAH6.M
test fluorescent time table and uv time table.update fld timetable from s



Area Percent Report

Sorted by Signal
Multiplier : 1.000000

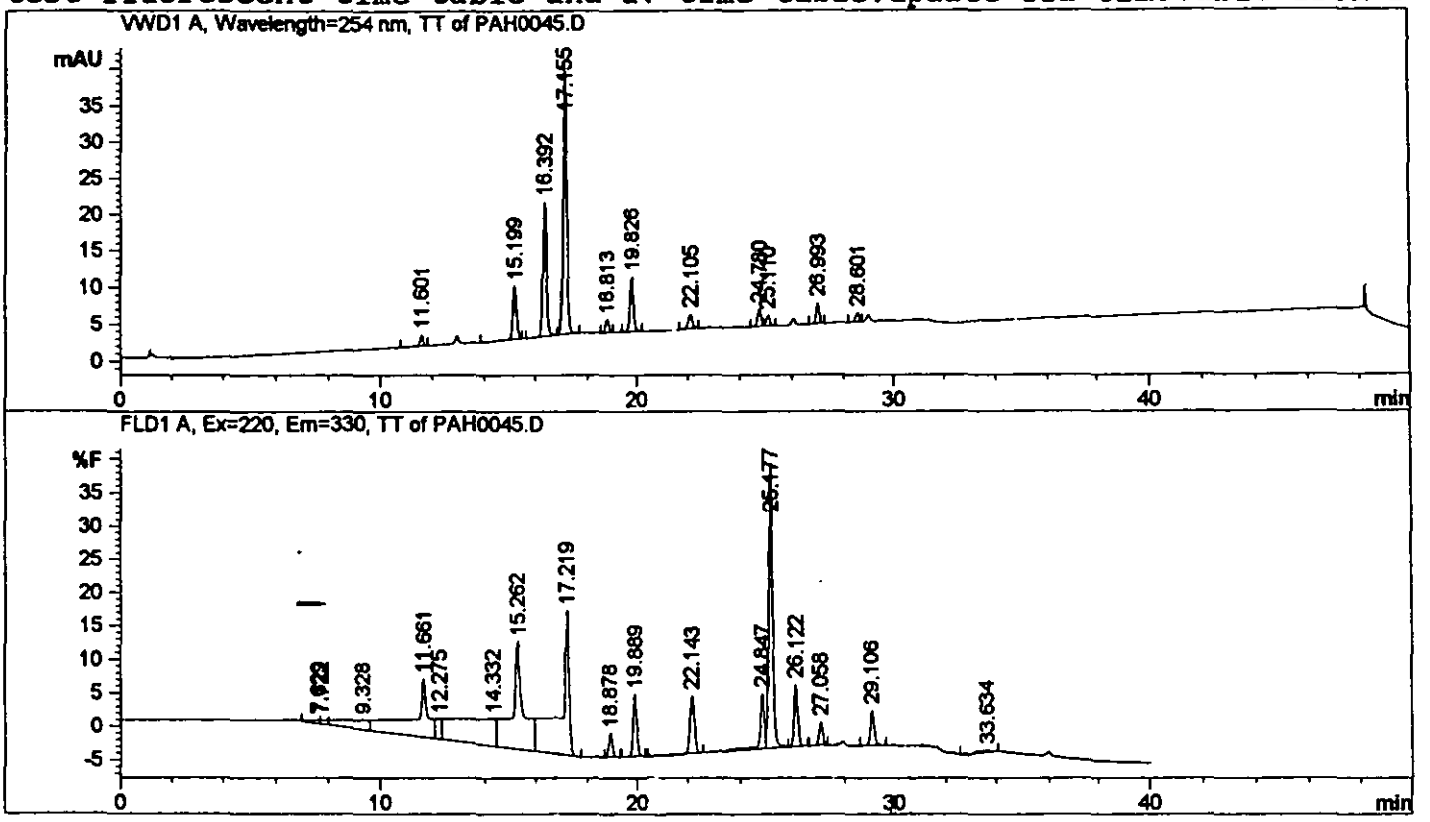
Signal 1: VWD1 A, Wavelength=254 nm, TT

Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	11.597	VV	0.134	14.20040	1.63052	1.4220
2	12.945	VV	0.134	11.74087	1.30435	1.1757
3	15.174	VV	0.149	84.36266	8.61441	8.4482
4	16.360	PV	0.146	206.39436	21.65091	20.6686
5	17.120	VV	0.148	432.84692	45.05371	43.3458
6	18.764	BB	0.148	20.66498	2.15754	2.0694
7	19.765	BB	0.155	90.61633	9.03092	9.0744
8	22.024	BB	0.167	25.23885	2.32008	2.5274
9	24.685	BV	0.151	27.63705	2.82499	2.7676
10	25.015	VB	0.151	17.41216	1.76109	1.7437
11	25.963	BB	0.149	10.04932	1.04665	1.0064
12	26.910	BB	0.145	30.20420	3.21658	3.0247
13	28.525	BV	0.151	14.08396	1.43596	1.4104
14	28.961	VB	0.163	13.13876	1.22777	1.3157

25 ul. loop prefilled.

Acq. Method	: SUPAH7.M	Seq. Line	: -
Acq. Operator	: suhana	Vial	: 1
Injection Date	: 22/8/96 12:01:22	Inj	: -
Sample Name	: pah	Inj Volume	: Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAH7.M
test fluorescent time table and uv time table.update fld timetable from s



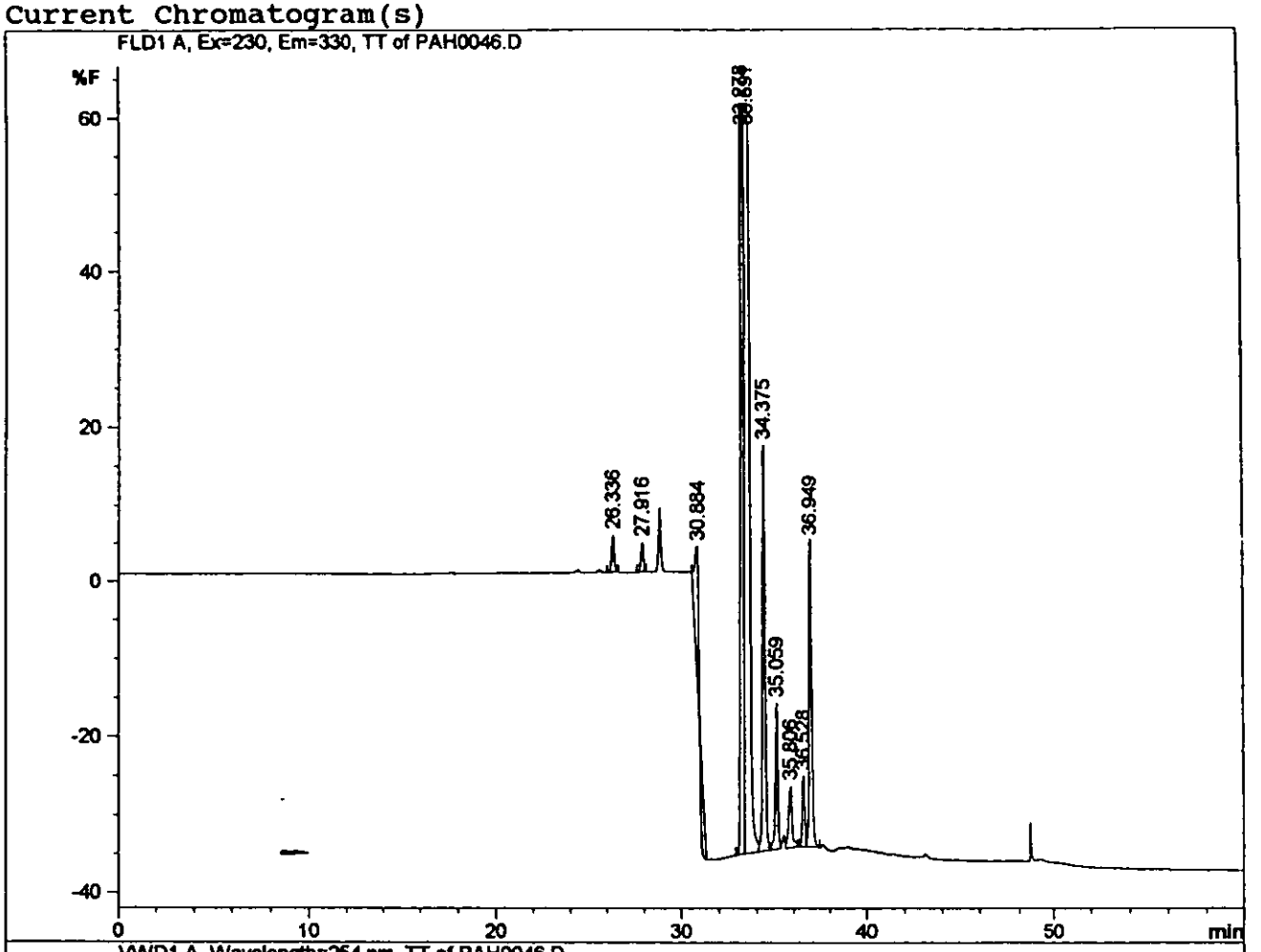
Area Percent Report

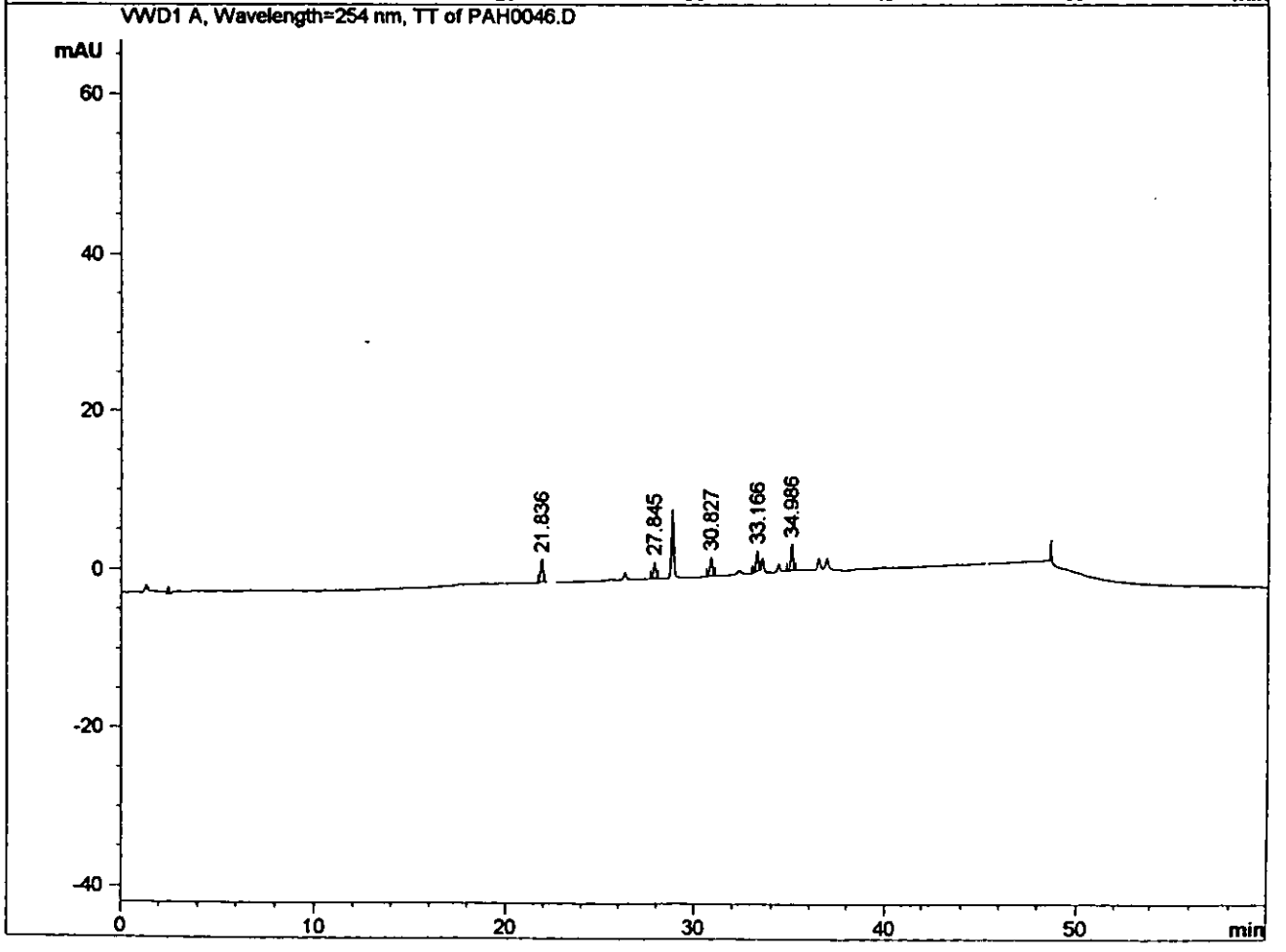
Sorted by Signal
Multiplier : 1.000000

Signal 1: VWD1 A, Wavelength=254 nm, TT

Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	11.601	VV	0.126	12.12669	1.49118	1.4862
2	15.199	PV	0.153	74.60323	7.31608	9.1433
3	16.392	PV	0.148	178.66241	18.43421	21.8967
4	17.155	VV	0.148	356.94031	37.19973	43.7462
5	18.813	BB	0.150	17.31292	1.78765	2.1219
6	19.826	BB	0.155	75.68966	7.49733	9.2764
7	22.105	BB	0.172	23.34708	2.03275	2.8614
8	24.780	BV	0.151	23.65760	2.41126	2.8994
9	25.110	VB	0.152	14.84639	1.51332	1.8196
10	26.993	BB	0.145	26.31876	2.81106	3.2256
11	28.601	BV	0.151	12.42918	1.27196	1.5233
Totals :				815.93420	83.76653	

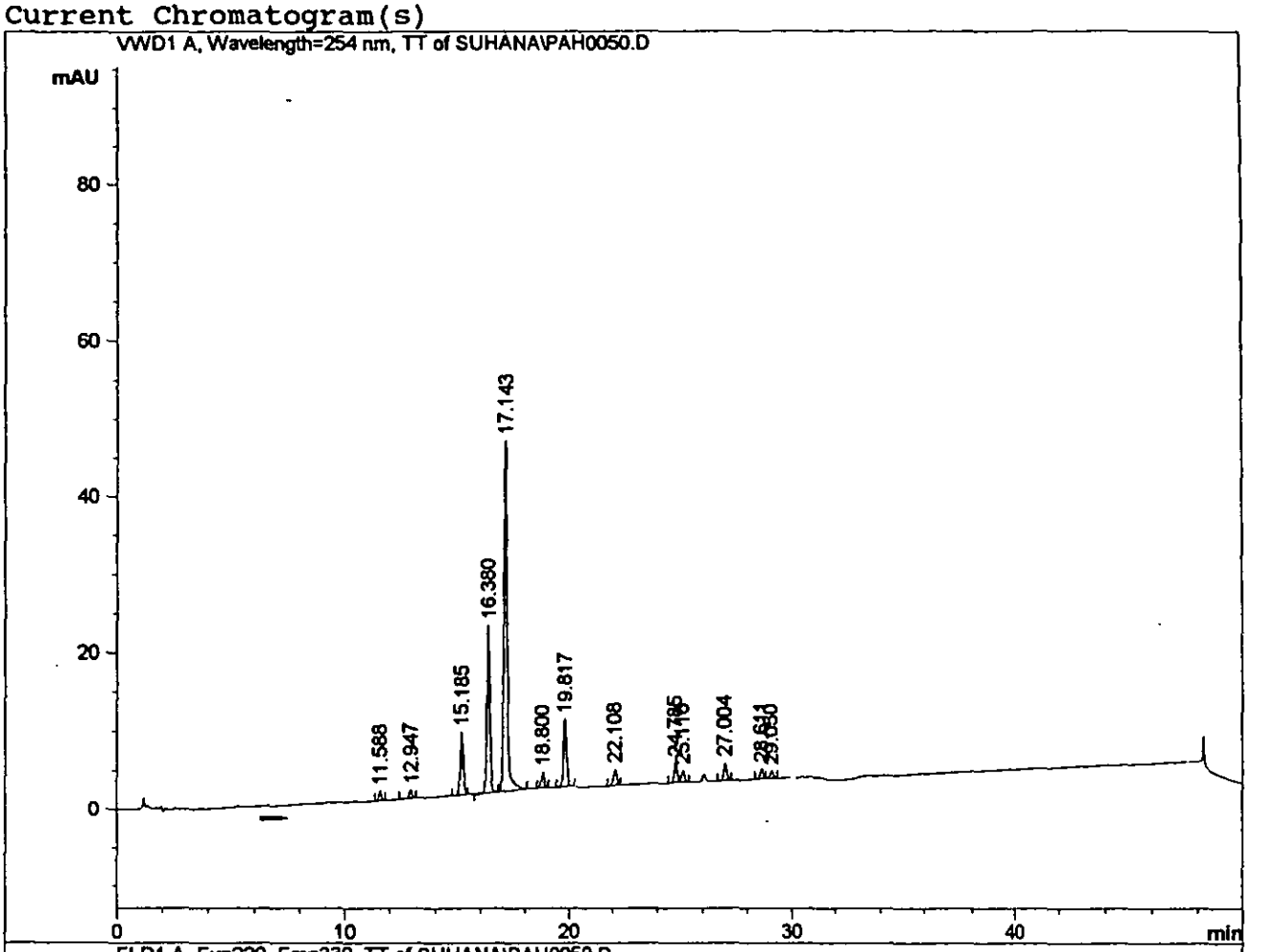
Current Chromatogram(s)

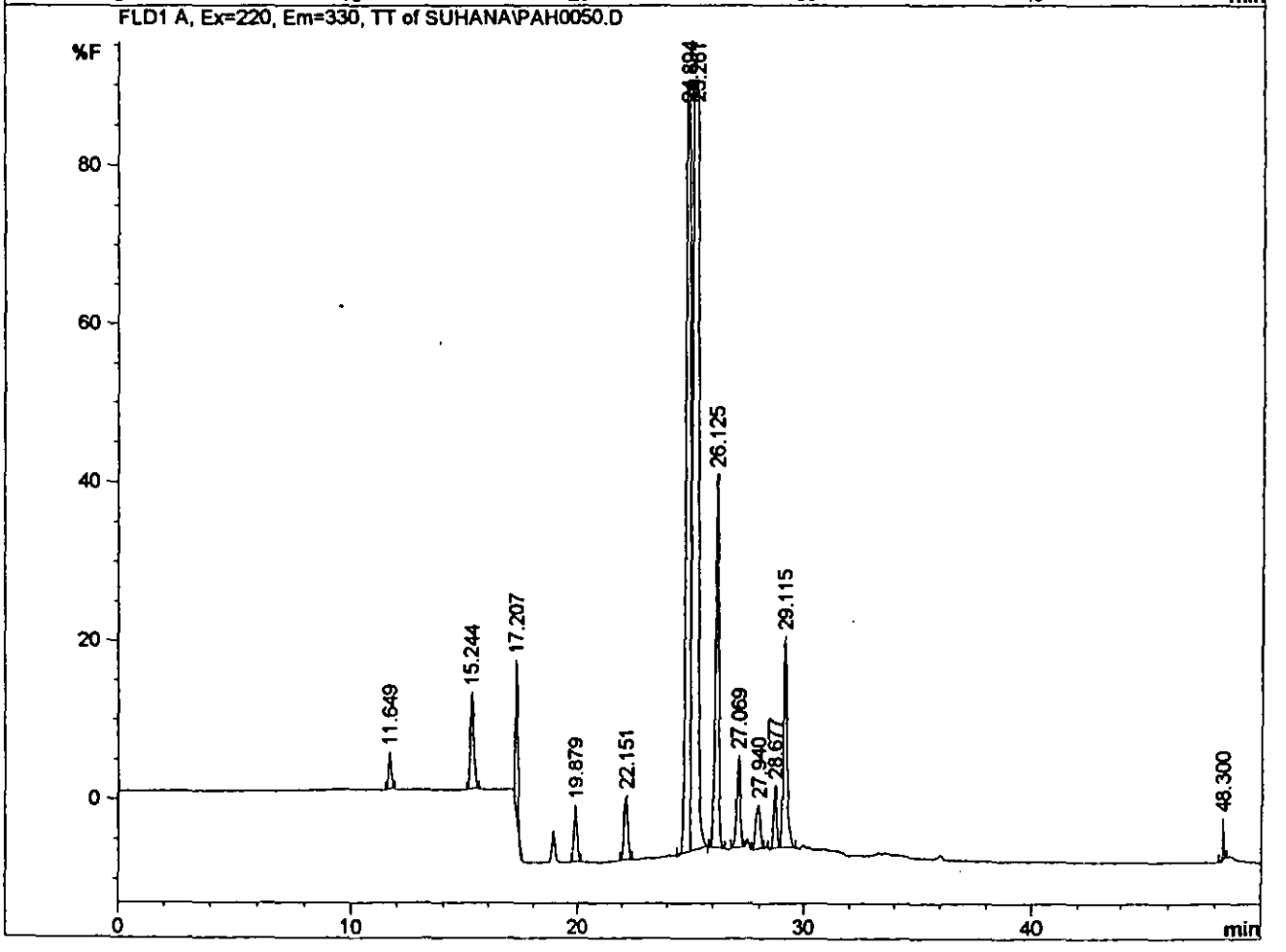




Thursday, August 22, 1996 14:23:38 by suhana

Current Chromatogram(s)



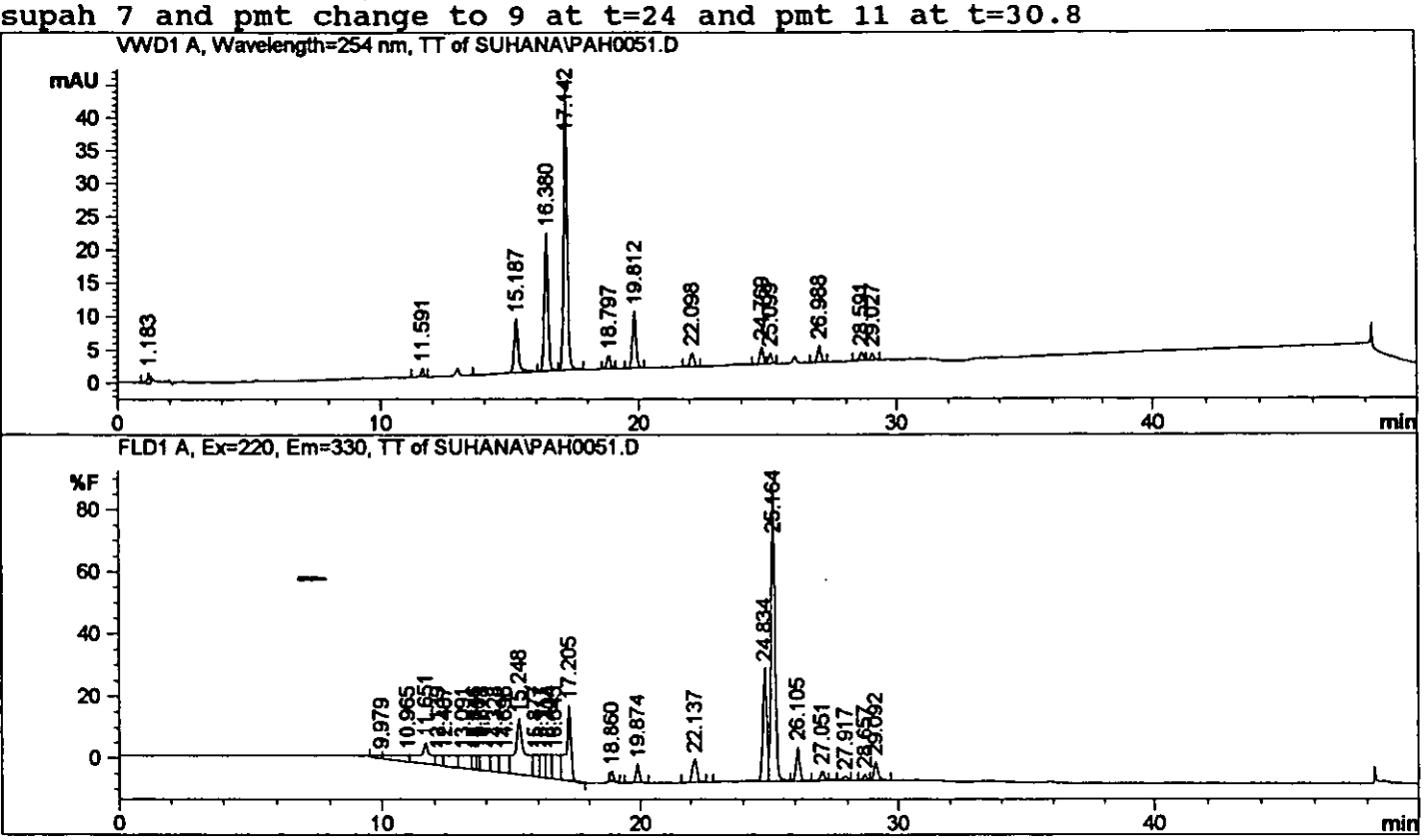


Sunday, August 25, 1996 15:03:35 by suhana

25 ul. loop prefilled.

```
Acq. Method       : SUPAH8.M                          Seq. Line :  -
Acq. Operator     : suhana                              Vial :  1
Injection Date    : 25/8/96 15:12:57                     Inj :  -
Sample Name       : pah                          Inj Volume : Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAH8.M
                  (modified after loading)
supah 7 and pmt change to 9 at t=24 and pmt 11 at t=30.8
```



Area Percent Report

Sorted by Signal
Multiplier : 1.000000

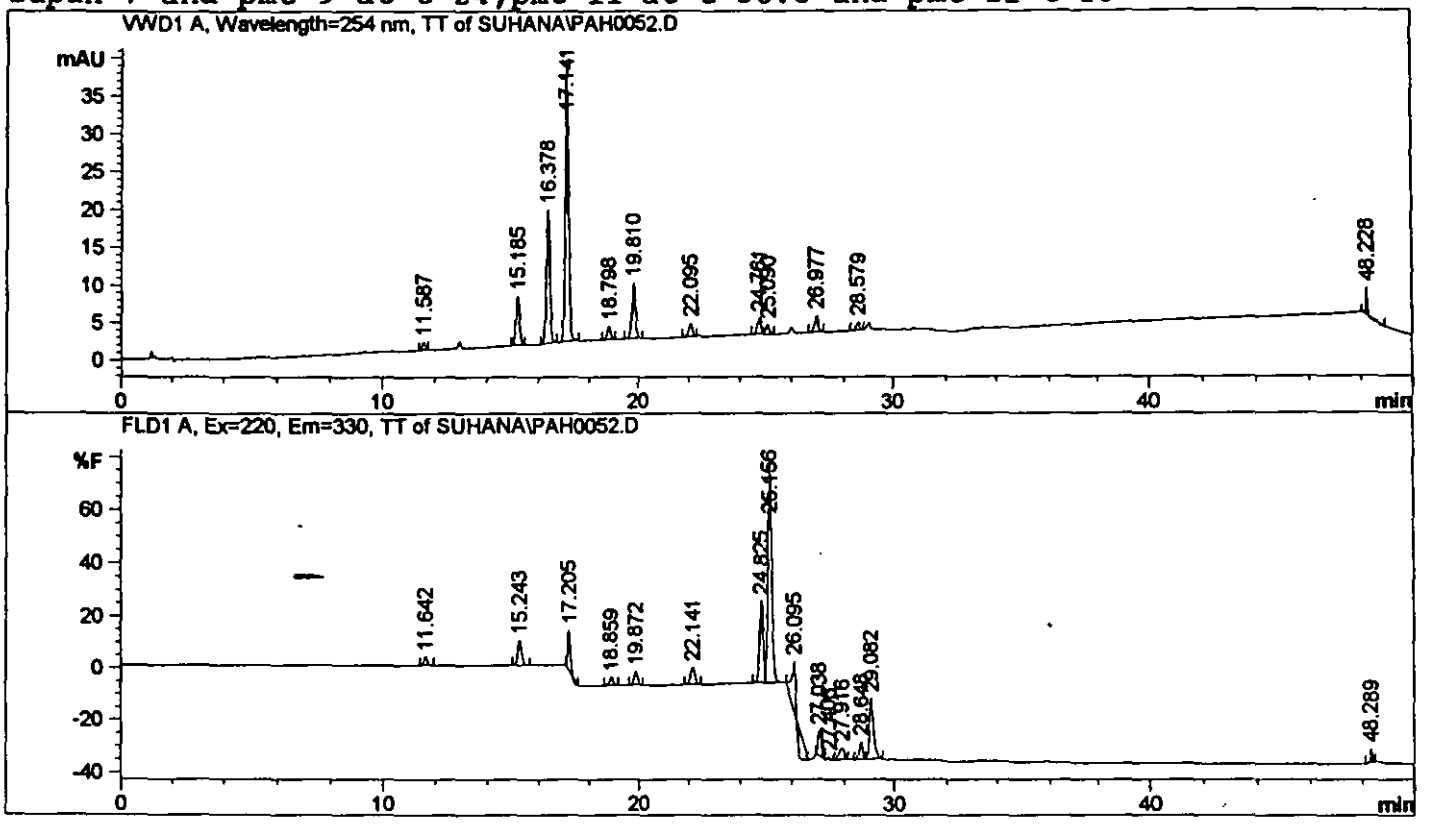
Signal 1: VWD1 A, Wavelength=254 nm, TT

Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	1.183	VV	0.093	11.68006	1.60697	1.2299
2	11.591	PV	0.128	10.67694	1.27697	1.1243
3	15.187	PV	0.167	92.36917	8.11695	9.7267
4	16.380	VV	0.147	199.51120	20.85604	21.0090
5	17.142	VV	0.148	418.13522	43.38239	44.0306
6	18.797	BB	0.147	19.63722	2.05747	2.0678
7	19.812	BB	0.156	86.63450	8.59422	9.1228
8	22.098	BB	0.166	22.73120	2.10251	2.3936
9	24.769	BV	0.151	25.19408	2.57448	2.6530
10	25.099	VB	0.151	15.28197	1.55795	1.6092
11	26.988	BB	0.148	24.22333	2.52306	2.5508
12	28.591	BV	0.151	12.64450	1.29373	1.3315
13	29.027	VB	0.163	10.92723	1.01914	1.1507

25 ul. loop prefilled.

Acq. Method	: SUPAH8.M	Seq. Line	: -
Acq. Operator	: suhana	Vial	: 1
Injection Date	: 25/8/96 16:46:11	Inj	: -
Sample Name	: pah	Inj Volume	: Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAH8.M
(modified after loading)
supah 7 and pmt 9 at t=24,pmt 11 at t=30.8 and pmt 11 t=26



Area Percent Report

Sorted by Signal
Multiplier : 1.000000

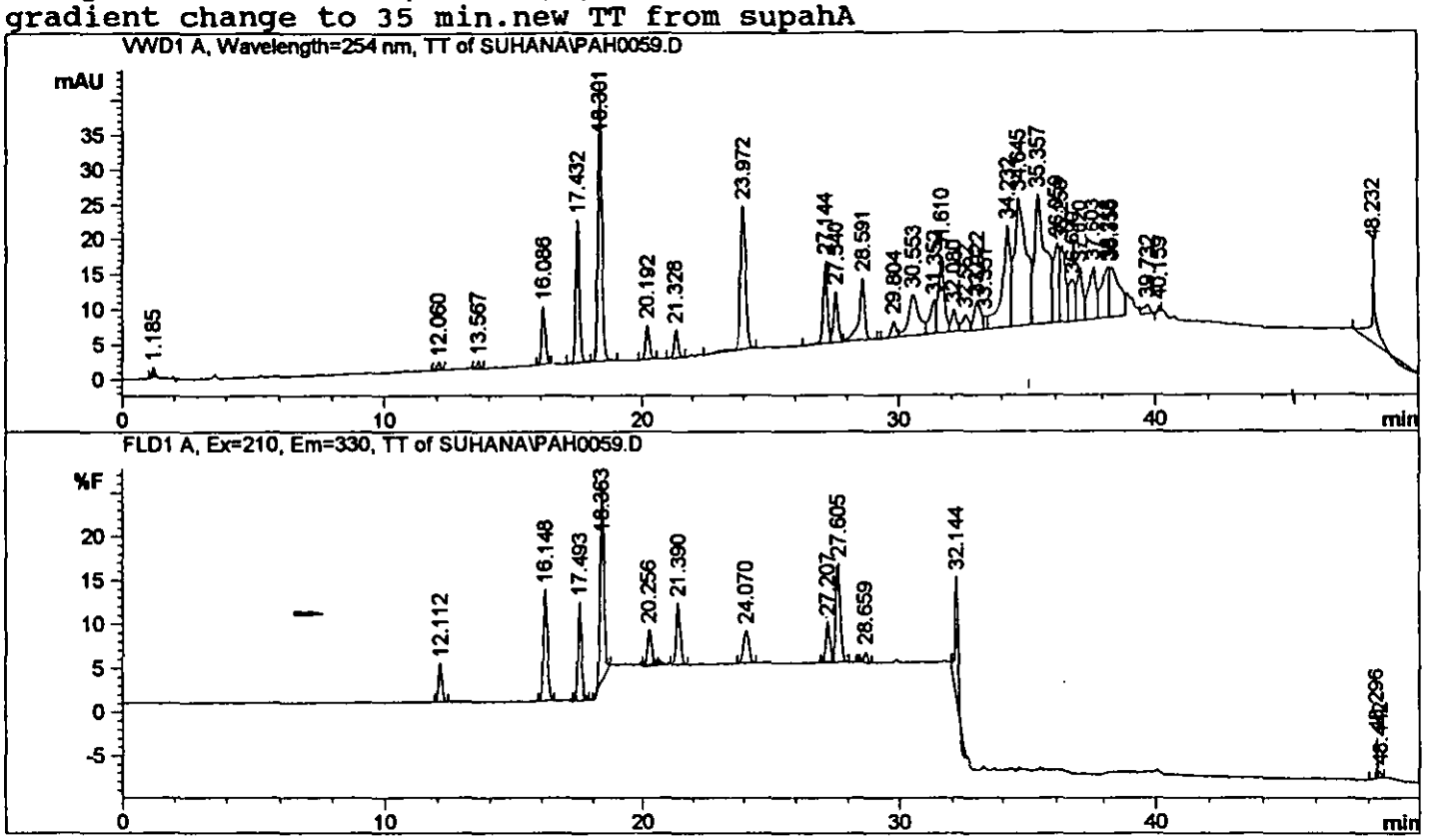
Signal 1: VWD1 A, Wavelength=254 nm, TT

Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	11.587	BB	0.124	8.46454	1.06012	1.1017
2	15.185	BB	0.144	62.57172	6.65255	8.1441
3	16.378	BB	0.144	166.09451	17.75910	21.6183
4	17.141	BB	0.146	349.35742	36.86525	45.4712
5	18.798	BB	0.150	16.95590	1.76589	2.2069
6	19.810	BB	0.155	74.40472	7.41465	9.6843
7	22.095	BB	0.163	18.67978	1.78190	2.4313
8	24.761	BV	0.150	21.47105	2.21920	2.7946
9	25.090	VB	0.150	12.95679	1.33371	1.6864
10	26.977	BB	0.148	21.38954	2.23282	2.7840
11	28.579	BB	0.148	10.61459	1.10586	1.3816
12	48.228	BB	0.066	5.34354	3.59602	0.6955

25 ul. loop prefilled.

Acq. Method	: SUPAHB.M	Seq. Line	: -
Acq. Operator	: suhana	Vial	: 1
Injection Date	: 28/8/96 11:52:01	Inj	: -
Sample Name	: pah	Inj Volume	: Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAHB.M
gradient change to 35 min.new TT from supahA



Area Percent Report

Sorted by Signal
Multiplier : 1.000000

Signal 1: VWD1 A, Wavelength=254 nm, TT

Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	1.185	BV	0.047	4.99985	1.50018	0.1046
2	12.060	BB	0.134	10.38636	1.17947	0.2173
3	13.567	BB	0.142	10.63620	1.15707	0.2226
4	16.086	BB	0.157	83.91188	8.21623	1.7559
5	17.432	BB	0.159	212.39470	20.55746	4.4445
6	18.301	BB	0.162	417.44501	39.70243	8.7354
7	20.192	BB	0.167	52.39310	4.85517	1.0964
8	21.328	BB	0.172	45.21613	4.06425	0.9462
9	23.972	BB	0.241	311.70712	20.55491	6.5227
10	27.144	BV	0.176	134.11674	11.65201	2.8065
11	27.540	VV	0.178	85.11391	7.26847	1.7811
12	28.591	VB	0.234	143.32709	8.72057	2.9992
13	29.804	BV	0.202	32.01172	2.31669	0.6699
14	30.553	VV	0.398	163.59702	5.82982	3.4234

25 ul. loop prefilled.

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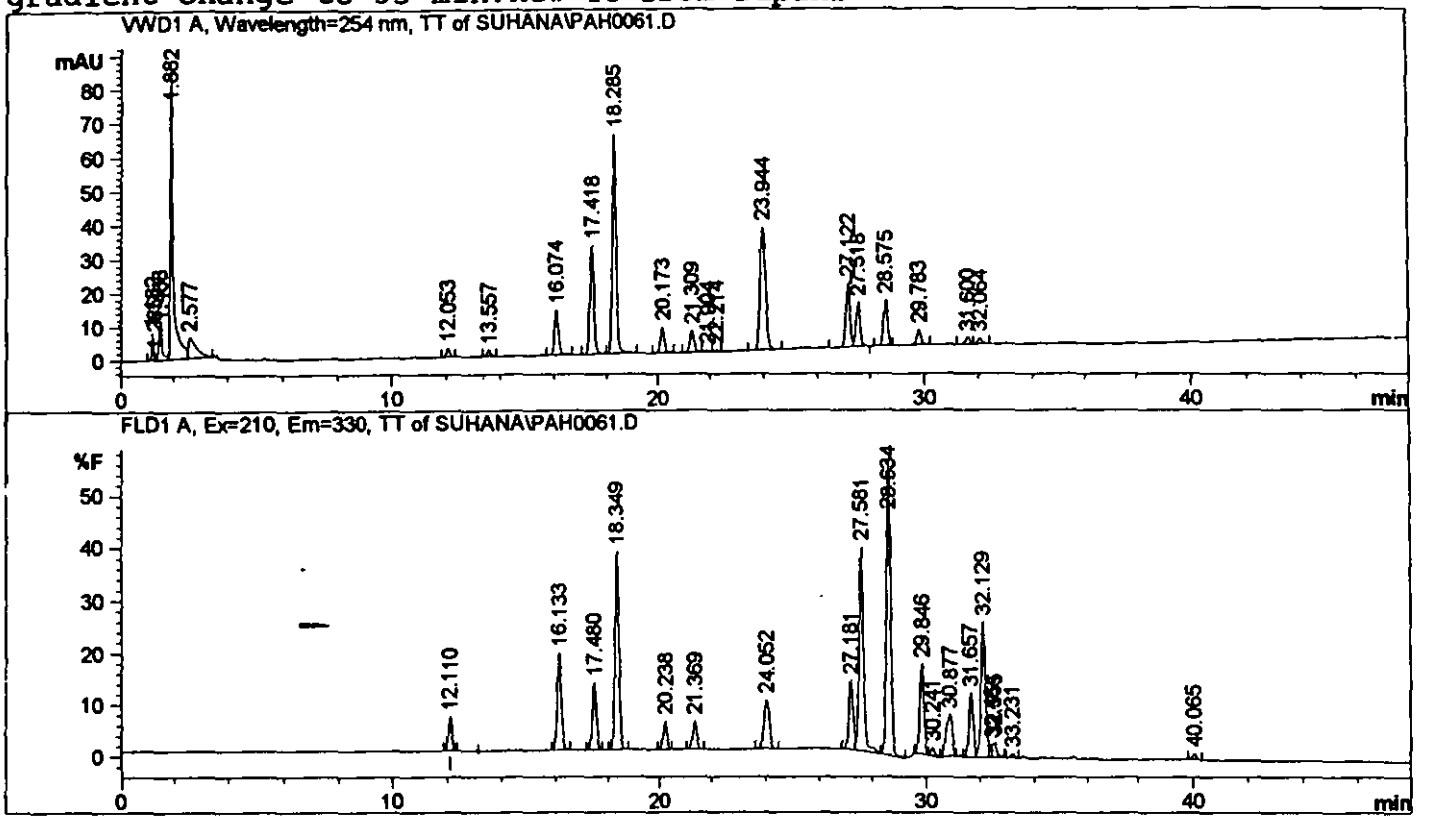
Acq. Method : SUPAHC.M
Acq. Operator : suhana
Injection Date : 28/8/96 14:45:53
Sample Name : pah

Seq. Line : -
Vial : 1
Inj : -
Inj Volume : Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAHC.M
gradient change to 35 min.new TT from supahb



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Area Percent Report

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Sorted by Signal
Multiplier : 1.000000

Signal 1: VWD1 A, Wavelength=254 nm, TT

Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	1.182	BV	0.057	32.97097	8.11670	0.9557
2	1.285	VV	0.065	7.53095	1.74886	0.2183
3	1.468	VV	0.118	92.50951	10.35594	2.6815
4	1.882	VV	0.103	653.53149	87.70382	18.9431
5	2.577	VV	0.273	133.08627	6.25788	3.8576
6	12.053	BB	0.135	24.37020	2.77473	0.7064
7	13.557	BB	0.144	18.24461	1.97222	0.5288
8	16.074	BB	0.162	145.09764	13.64526	4.2058
9	17.418	BV	0.161	342.45480	32.72340	9.9263
10	18.285	VB	0.165	697.97540	64.99937	20.2314
11	20.173	BB	0.167	84.80125	7.85197	2.4580
12	21.309	BV	0.174	74.36890	6.62017	2.1556
13	21.904	PV	0.159	5.20964	5.17047e-1	0.1510
14	22.214	VB	0.166	4.83357	4.62070e-1	0.1401

5 ul. loop prefilled.

```
cq. Method      : SUPAHS.M                          Seq. Line :  -
cq. Operator    : suhana                               Vial :  1
njection Date   : 30/8/96 10:01:51                      Inj :  -
ample Name      : pah                           Inj Volume : Unknown

nalysis Method : C:\HPCHEM\1\METHODS\SUPAHS.M
                 (modified after loading)
upah d/s for 1000ug/L
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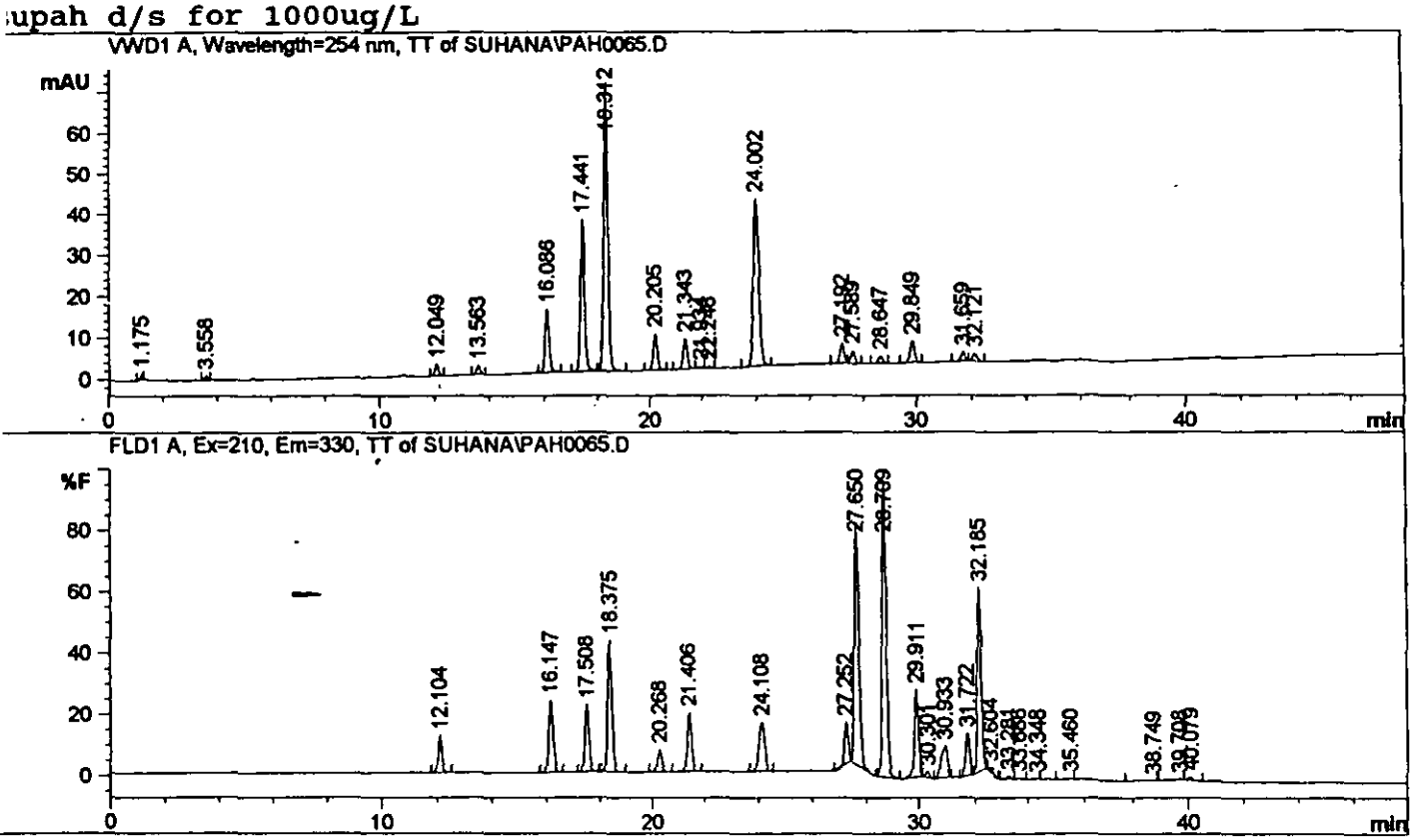


Area Percent Report

Sorted by Signal
Multiplier : 1.000000

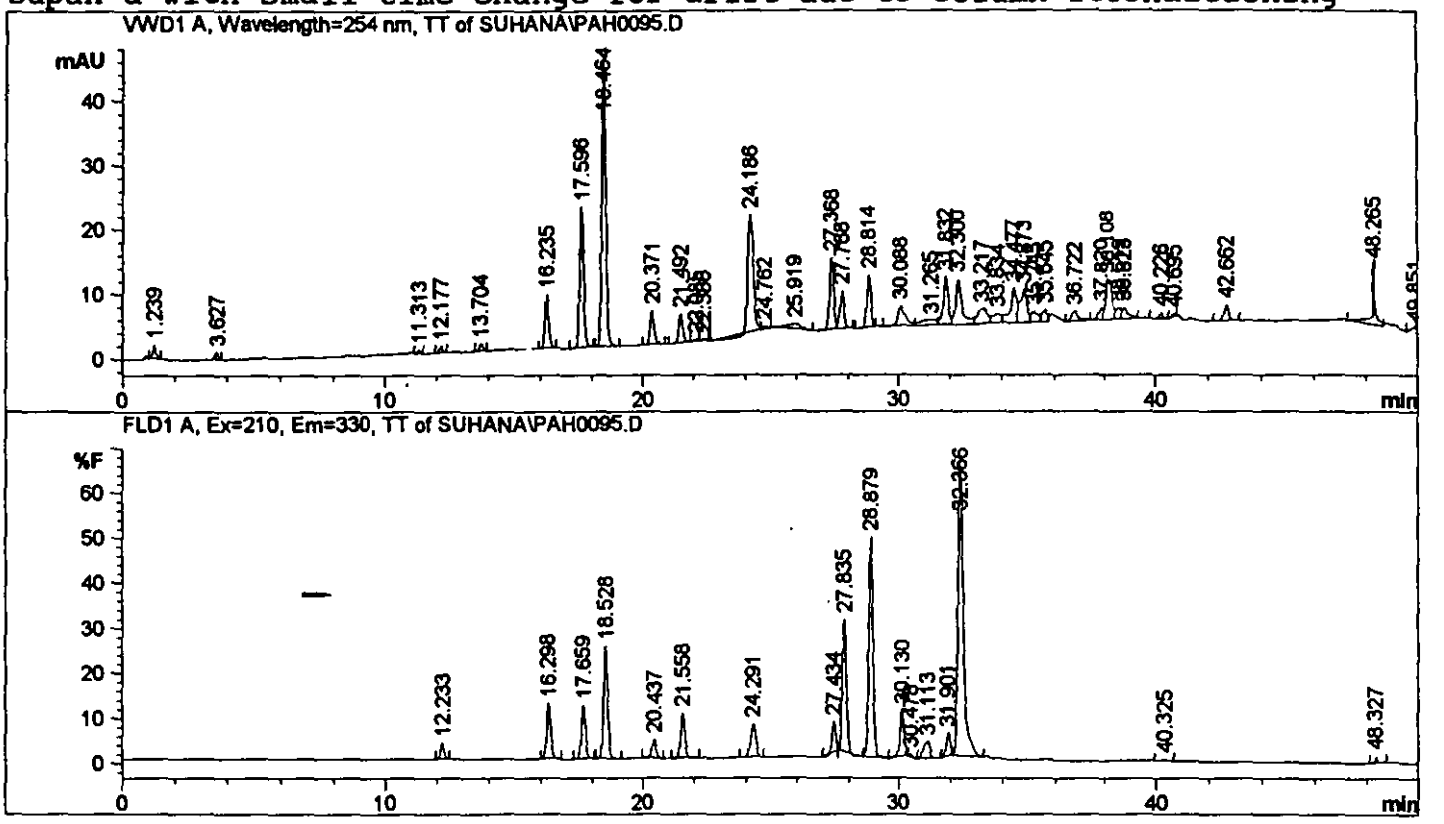
Signal 1: VWD1 A, Wavelength=254 nm, TT

Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	1.175	BV	0.048	5.02015	1.46956	0.2141
2	3.558	BB	0.102	7.67273	1.06658	0.3272
3	12.049	BB	0.137	25.82459	2.91279	1.1012
4	13.563	BB	0.146	20.76848	2.21808	0.8856
5	16.086	BB	0.162	162.59993	15.27537	6.9337
6	17.441	BV	0.163	391.63519	36.81828	16.7003
7	18.312	VB	0.164	744.74133	69.98123	31.7576
8	20.205	BB	0.168	94.53569	8.71856	4.0312
9	21.343	BV	0.179	87.11053	7.43388	3.7146
10	21.934	VV	0.175	7.19791	6.15274e-1	0.3069
11	22.246	VB	0.169	5.58684	5.16506e-1	0.2382
12	24.002	BB	0.231	583.76154	40.73769	24.8930
13	27.192	BV	0.171	53.11815	4.81588	2.2651

25 ul. loop prefilled.new sample

Acq. Method	: SUPAHS.M	Seq. Line	: -
Acq. Operator	: suhana	Vial	: 1
Injection Date	: 11/9/96 11:07:56	Inj	: -
Sample Name	: pah 500	Inj Volume	: Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAHS.M
supah d with small time change for drift due to column reconditioning



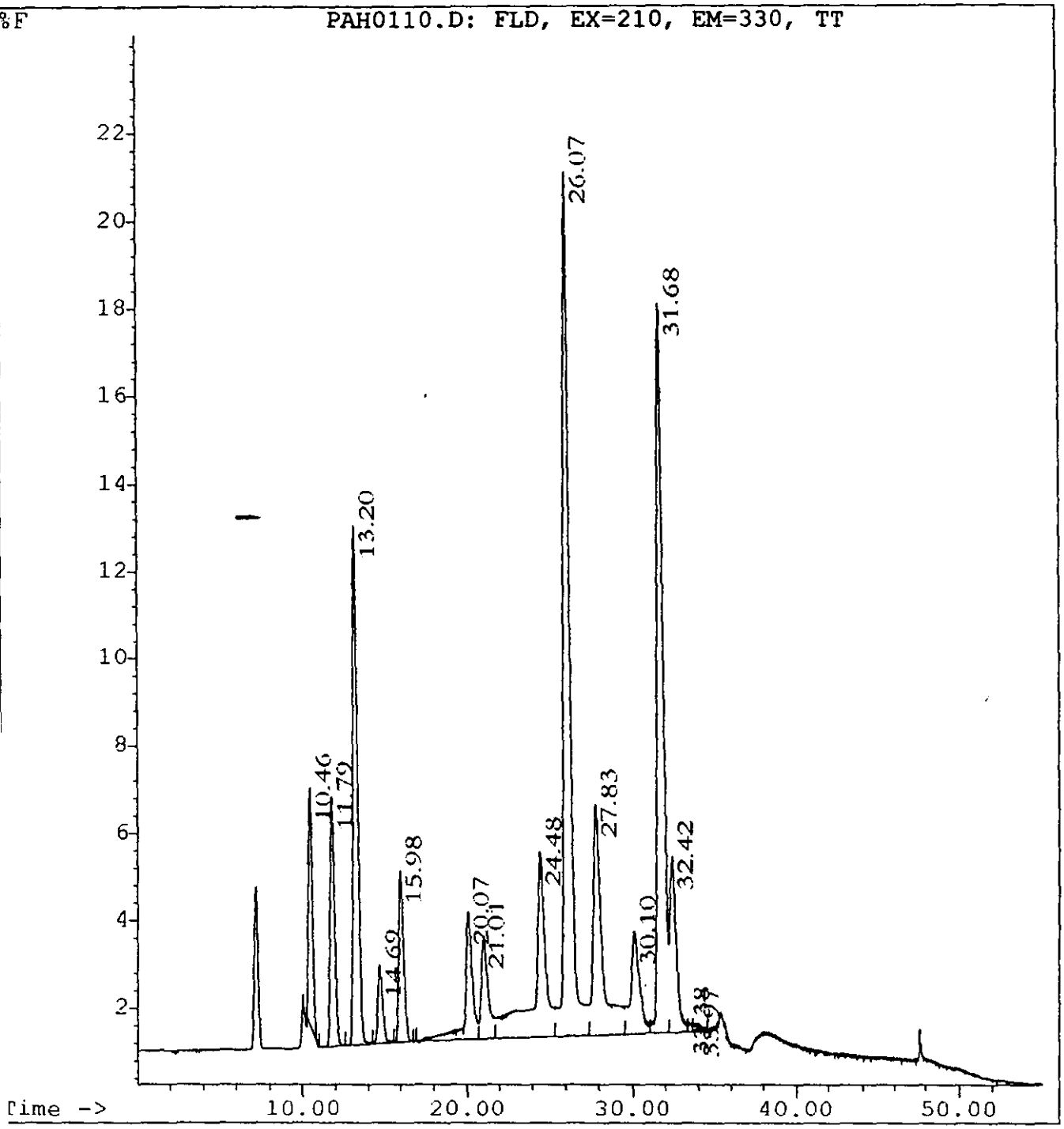
Area Percent Report

Sorted by Signal
Multiplier : 1.000000

Signal 1: VWD1 A, Wavelength=254 nm, TT

Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	1.239	BB	0.102	16.49047	2.08672	0.6448
2	3.627	VB	0.089	7.46047	1.22065	0.2917
3	11.313	BB	0.112	4.51517	5.98180e-1	0.1765
4	12.177	BB	0.135	8.55983	9.79626e-1	0.3347
5	13.704	BB	0.141	10.41554	1.13557	0.4072
6	16.235	BB	0.156	83.69862	8.29499	3.2726
7	17.596	BB	0.160	227.10718	21.83451	8.8798
8	18.464	BB	0.163	465.60797	43.90558	18.2050
9	20.371	BB	0.171	59.21240	5.29608	2.3152
10	21.492	BV	0.174	51.13525	4.51326	1.9994
11	22.085	VV	0.163	3.65984	3.48233e-1	0.1431
12	22.386	VB	0.164	3.09406	2.97124e-1	0.1210
13	24.186	BV	0.227	253.62411	18.21322	9.9166
14	24.762	VB	0.218	6.08357	4.05588e-1	0.2379

File: A:\PAH0110.D
Operator: suhana
Date Acquired: 13/9/96 18:37:27
Method File Name: SUPAHS.M
Sample Name: pah 500
Misc Info:
Bottle Number: 1



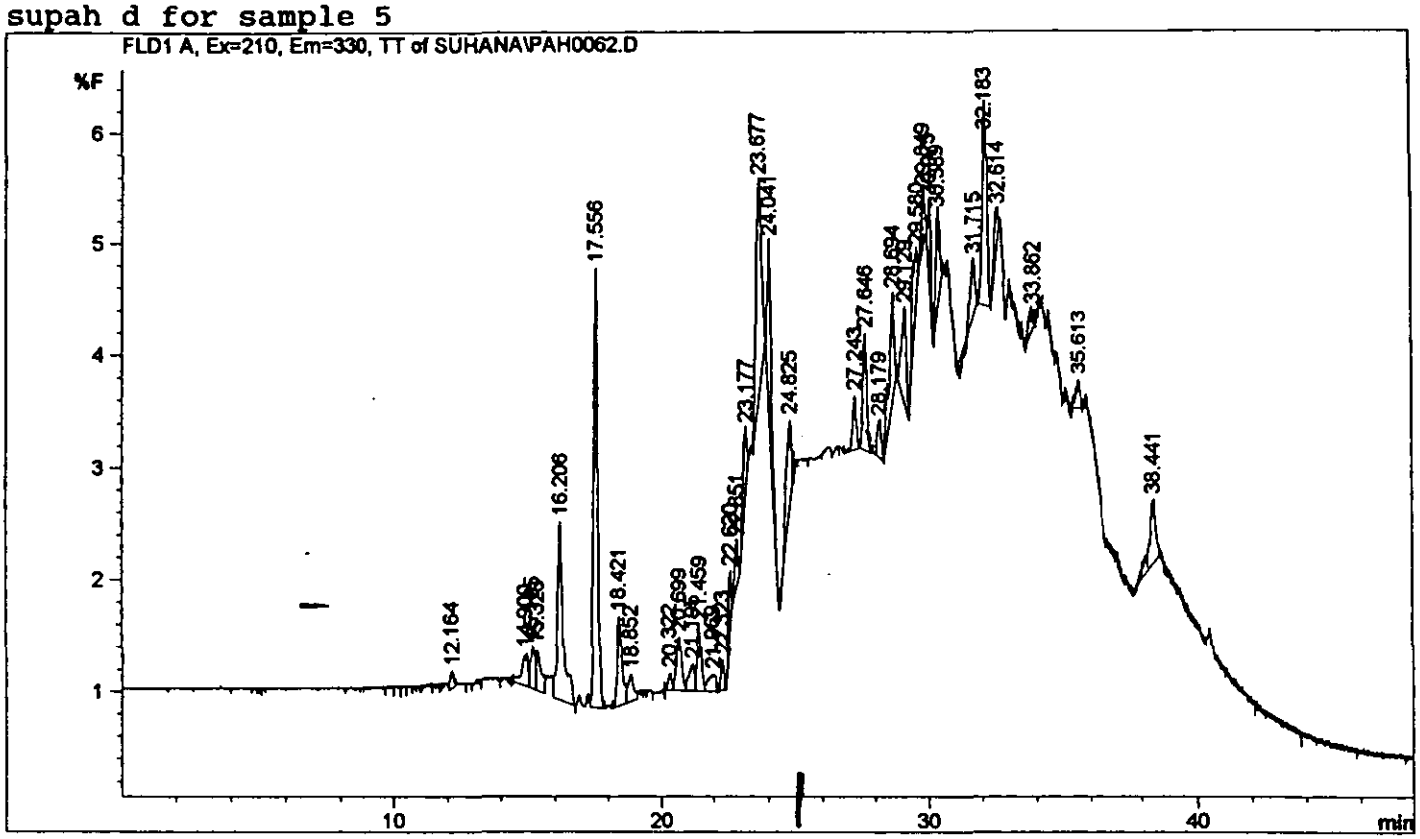
		Notes and Comment on sample chromatograms
4	Chrom.	**Method Development for FLD Sample Chromatograms**
	0062	Using Sample 5 and Supah C. Change in Ex =453 at T=25m.
		Result in loss of peak height.
	0063	Supah D. Change Ex=420 at T=25m.
		Using Sample 5 and Supah D. Better than 0062.
	0066	Sample Day 15 Airlift Trial run, peaks distinguishible
	0067	Supah D. Sample Day 15 Airlift Trial Run + Napthalene to indicate
		first peak RT.
	0068	Supah D.Sample Day 10 Allift Trial run, peaks distinguishible
	0069	Sample Day 5 Airlift Trial run, peaks distinguishible.

25 ul. loop prefilled.

Acq. Method	: SUPAHC.M	Seq. Line	: -
Acq. Operator	: suhana	Vial	: 1
Injection Date	: 28/8/96 16:15:55	Inj	: -
Sample Name	: sample 5	Inj Volume	: Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAHD.M
(modified after loading)

supah d for sample 5



Area Percent Report

Sorted by Signal
Multiplier : 1.000000

Signal 1: FLD1 A, Ex=210, Em=330, TT

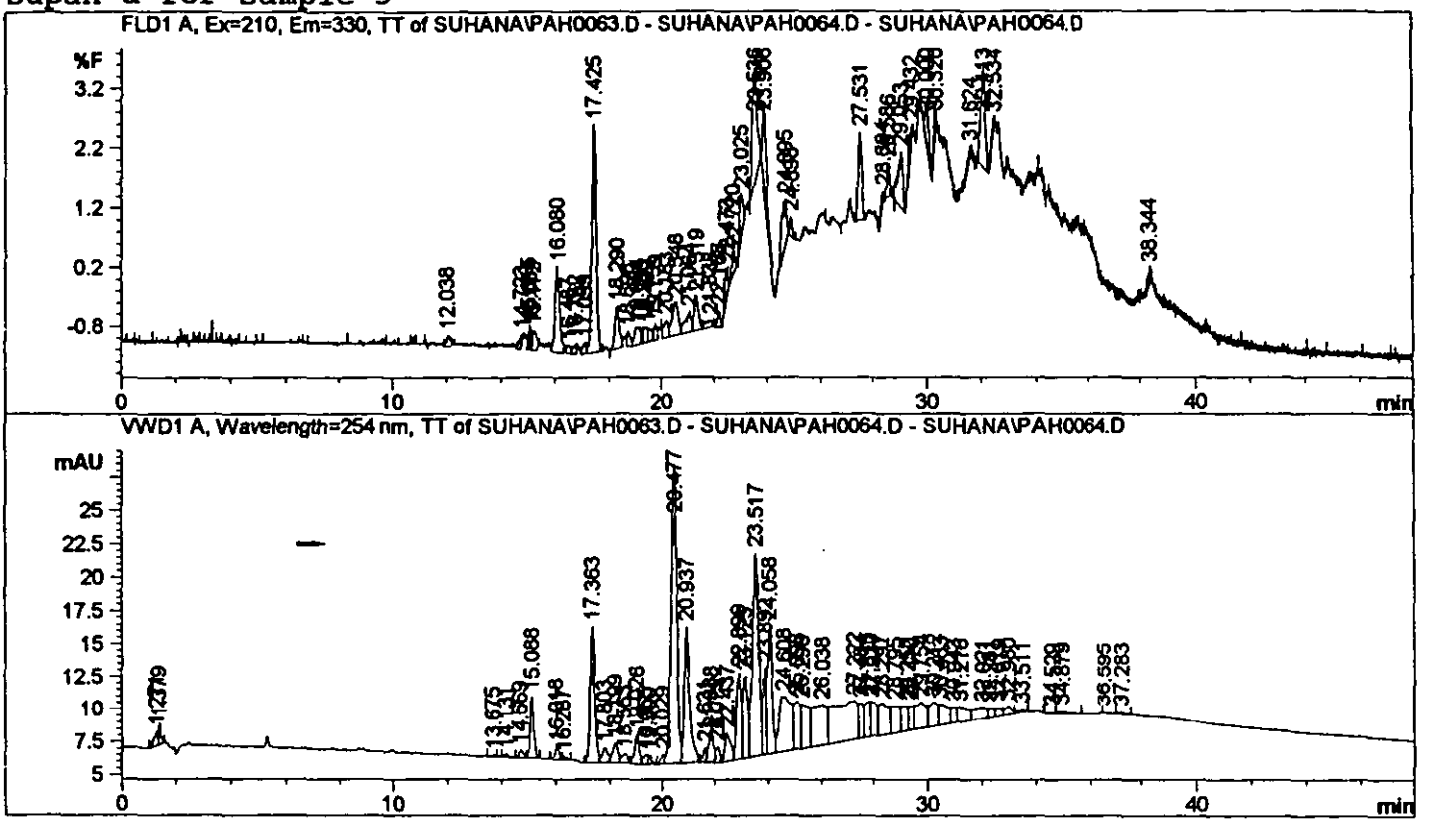
Peak #	RT [min]	Type	Width [min]	Area [%F*sec]	Height [%F]	Area %
1	12.164	PV	0.116	1.51534	1.62035e-1	0.4979
2	14.900	PV	0.222	5.24127	2.99512e-1	1.7221
3	15.165	VV	0.147	4.53131	3.90864e-1	1.4889
4	15.323	VV	0.177	4.97051	3.69940e-1	1.6332
5	16.206	VV	0.193	23.92286	1.58971	7.8603
6	17.556	VV	0.145	41.04367	3.92006	13.4857
7	18.421	PV	0.178	10.23963	7.94924e-1	3.3644
8	18.852	VV	0.193	3.80950	2.45248e-1	1.2517
9	20.322	BV	0.128	1.46756	1.52003e-1	0.4822
10	20.699	VV	0.194	6.86976	4.72822e-1	2.2572
11	21.195	VV	0.188	3.63125	2.40142e-1	1.1931
12	21.459	VV	0.169	6.78569	5.87405e-1	2.2296
13	21.969	VB	0.255	3.22187	1.54413e-1	1.0586

File C:\HPCHEM\1\DATA\SUHANA\PAH0063.D

25 ul. loop prefilled.

Acq. Method	: SUPAHD.M	Seq. Line	: -
Acq. Operator	: suhana	Vial	: 1
Injection Date	: 28/8/96 17:34:37	Inj	: -
Sample Name	: sample 5	Inj Volume	: Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAHS.M
(modified after loading)
supah d for sample 5



Area Percent Report

Sorted by Signal
Multiplier : 1.000000

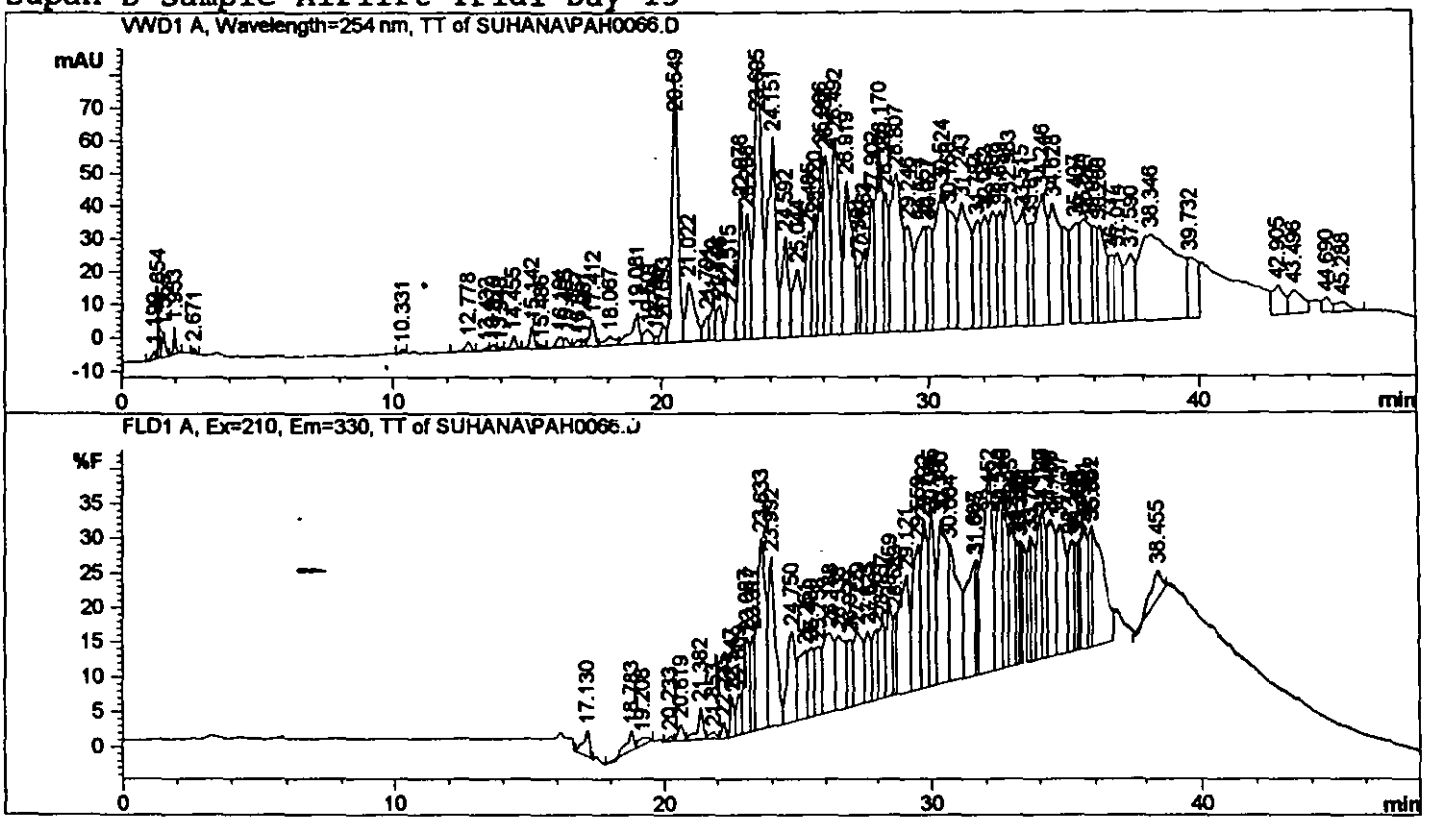
Signal 1: FLD1 A, Ex=210, Em=330, TT
Signal has been modified after loading from rawdata file!

Peak #	RT [min]	Type	Width [min]	Area [%F*sec]	Height [%F]	Area %
1	12.038	VV	0.134	2.03987	1.93258e-1	0.7688
2	14.723	VV	0.081	1.64974	2.60170e-1	0.6218
3	15.015	VV	0.059	1.74232	4.14136e-1	0.6567
4	15.054	VV	0.060	1.73681	3.68857e-1	0.6546
5	15.172	VV	0.130	3.17516	3.29188e-1	1.1967
6	16.080	VV	0.138	16.88205	1.46763	6.3630
7	16.487	VV	0.128	1.38358	1.37370e-1	0.5215
8	16.762	VV	0.098	1.39774	1.81905e-1	0.5268
9	17.099	PV	0.110	1.69677	1.88352e-1	0.6395
10	17.425	VV	0.136	41.44993	3.84263	15.6228
11	18.290	PV	0.139	8.34399	7.27010e-1	3.1449
12	18.696	VV	0.107	2.22477	2.53518e-1	0.8385

25 ul. loop prefilled.

Acq. Method	: SUPAHD.M	Seq. Line	: -
Acq. Operator	: suhana	Vial	: 1
Injection Date	: 30/8/96 11:16:29	Inj	: -
Sample Name	: ALD15	Inj Volume	: Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAHD.M
(modified after loading)
supah D sample Airlift Trial Day 15



Area Percent Report

Sorted by Signal
Multiplier : 1.000000

Signal 1: VWD1 A, Wavelength=254 nm, TT

Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	1.199	BV	0.127	22.69684	2.51175	0.0631
2	1.354	VV	0.056	59.39570	15.41805	0.1653
3	1.555	VV	0.121	64.96346	7.54649	0.1807
4	1.953	VB	0.077	46.06982	8.14381	0.1282
5	2.671	BB	0.091	9.85260	1.67021	0.0274
6	10.331	BB	0.148	11.42685	1.23172	0.0318
7	12.778	BV	0.243	47.62333	2.83981	0.1325
8	13.432	VV	0.191	15.57308	1.15868	0.0433
9	13.679	VV	0.188	22.16392	1.77217	0.0617
10	13.948	VV	0.175	12.29050	1.03463	0.0342
11	14.455	VV	0.206	56.40339	4.05224	0.1569
12	15.142	VV	0.182	82.77332	6.85625	0.2303
13	15.486	VV	0.188	15.05409	1.25103	0.0419

25 ul. loop prefilled.

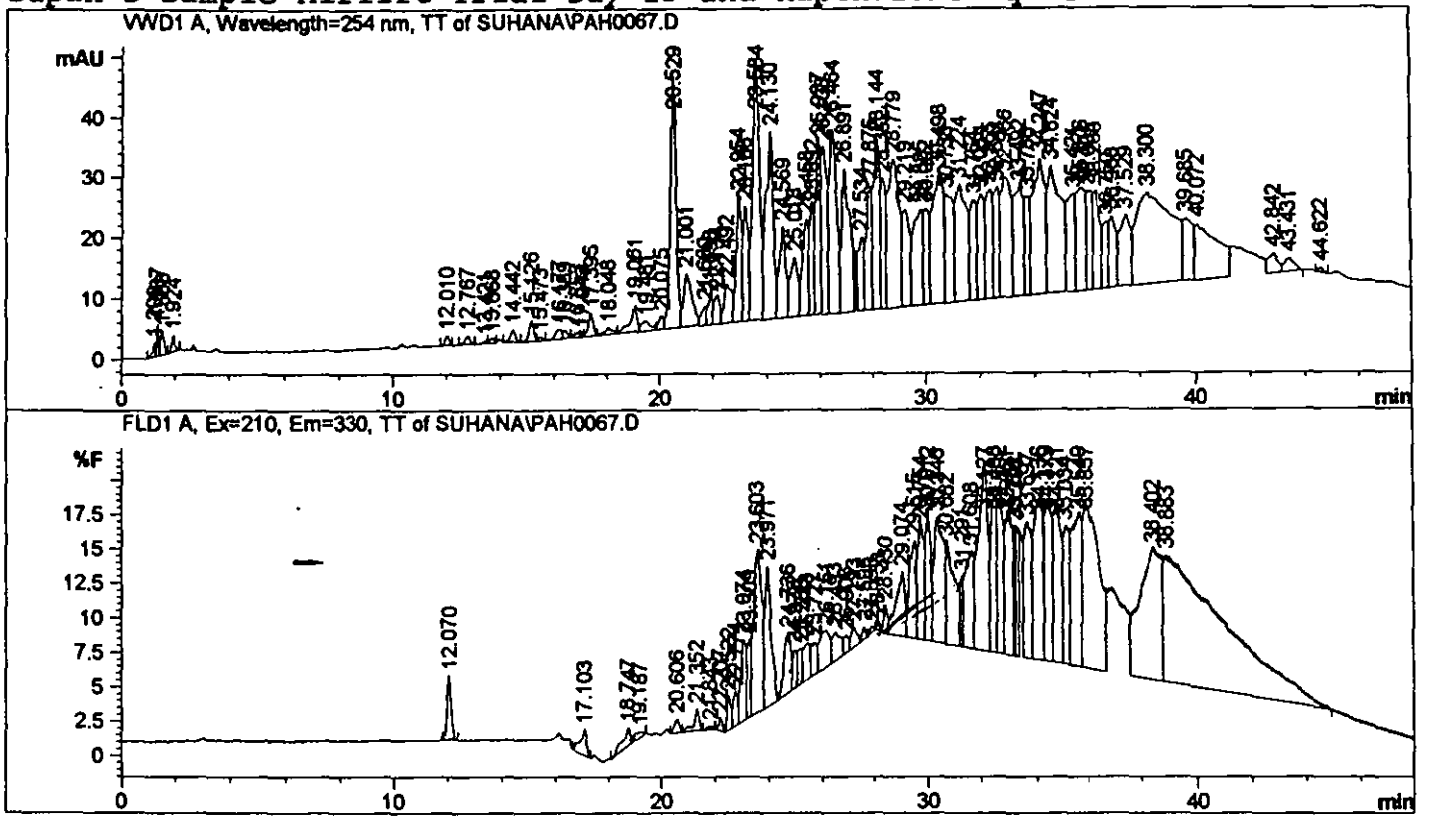
==========

Acq. Method : SUPAHD.M
Acq. Operator : suhana
Injection Date : 30/8/96 12:16:27
Sample Name : ALD15 and N

Seq. Line : -
Vial : 1
Inj : -
Inj Volume : Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAHD.M
(modified after loading)

supah D sample Airlift Trial Day 15 and napthalene equil vol



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Area Percent Report

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Sorted by Signal
Multiplier : 1.000000

Signal 1: VWD1 A, Wavelength=254 nm, TT

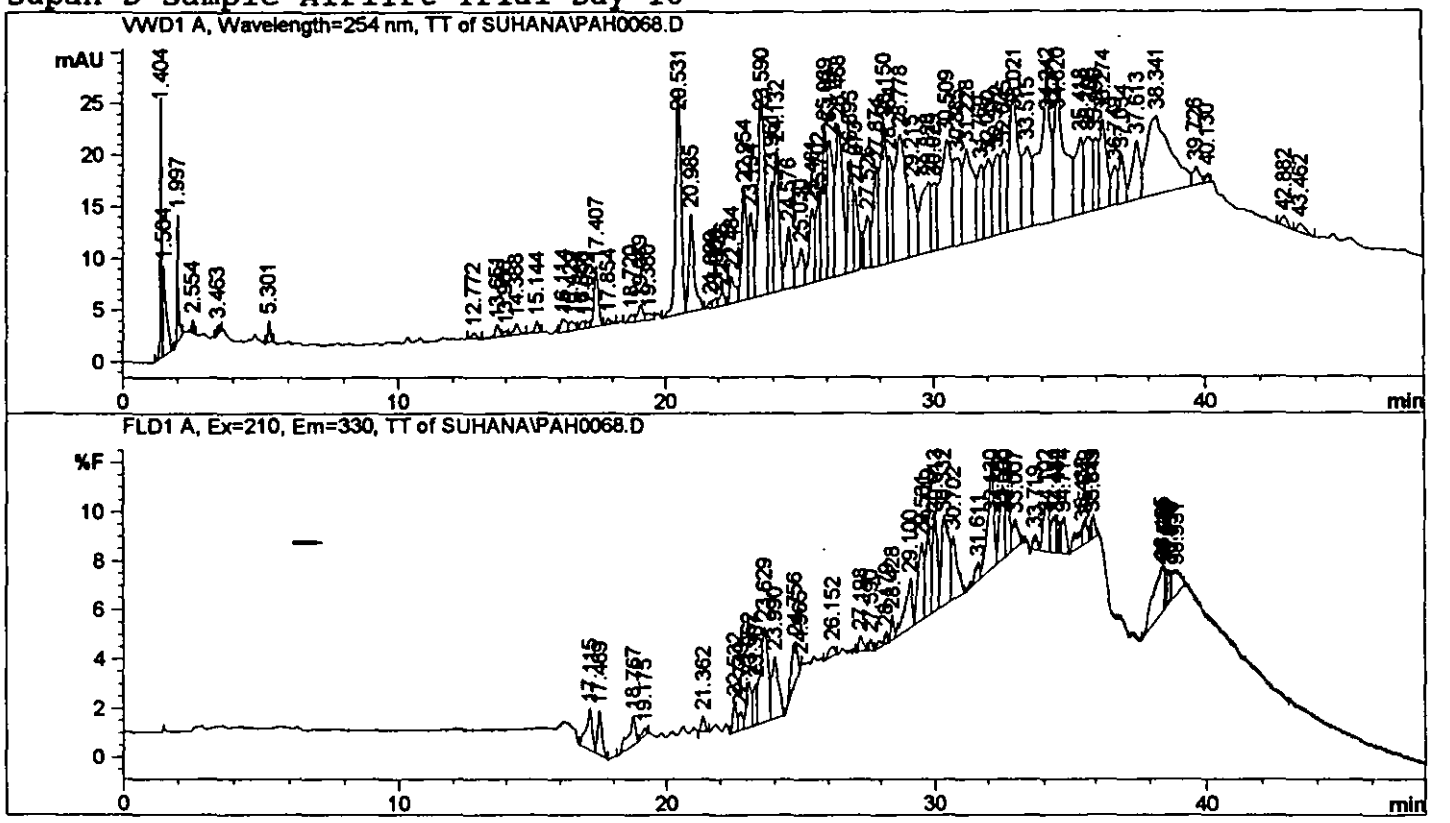
Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	1.209	BV	0.095	16.22410	2.30986	0.0860
2	1.337	VV	0.083	27.72558	5.24033	0.1469
3	1.508	VV	0.121	36.45708	4.08946	0.1932
4	1.924	PB	0.104	21.06218	2.63930	0.1116
5	12.010	BB	0.152	15.66148	1.60386	0.0830
6	12.767	BV	0.218	19.02304	1.35286	0.1008
7	13.421	PV	0.174	6.39778	5.37885e-1	0.0339
8	13.668	VV	0.185	10.92942	8.75392e-1	0.0579
9	14.442	VV	0.202	27.47592	2.04081	0.1456
10	15.126	VV	0.186	42.37553	3.45121	0.2246
11	15.473	VV	0.190	7.88731	6.51662e-1	0.0418
12	16.177	PV	0.264	27.55979	1.65467	0.1461
13	16.389	VV	0.175	16.01839	1.35392	0.0849

25 ul. loop prefilled.

Acq. Method : SUPAHD.M	Seq. Line : -
Acq. Operator : suhana	Vial : 1
Injection Date : 30/8/96 13:32:52	Inj : -
Sample Name : ALD10	Inj Volume : Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAHD.M
(modified after loading)

supah D sample Airlift Trial Day 10



Area Percent Report

Sorted by Signal
Multiplier : 1.000000

Signal 1: VWD1 A, Wavelength=254 nm, TT

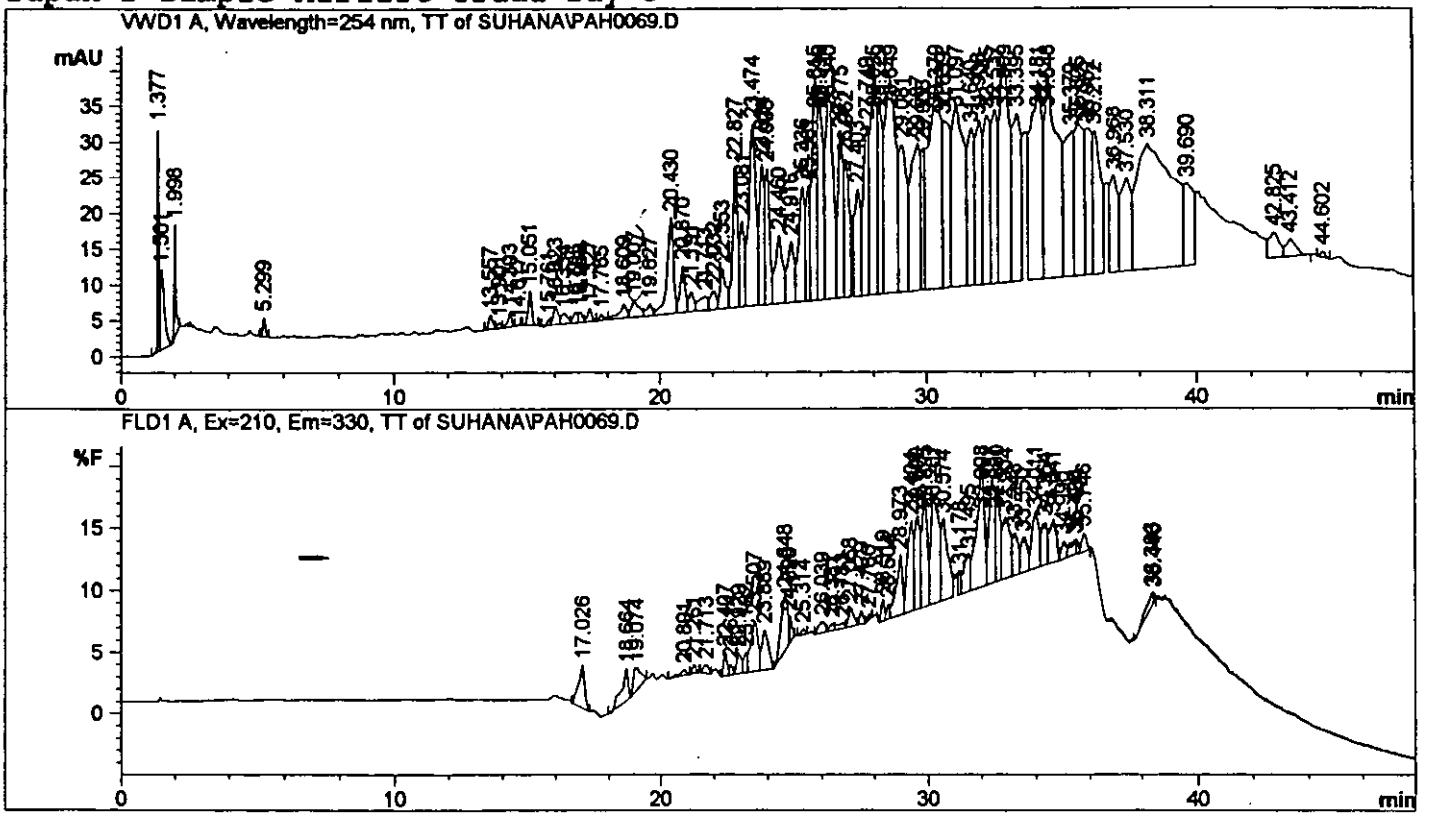
Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	1.404	BV	0.047	79.40717	25.24145	0.9737
2	1.504	VB	0.112	72.27006	8.67778	0.8862
3	1.997	BV	0.048	41.19289	12.29913	0.5051
4	2.554	VB	0.063	5.51573	1.34261	0.0676
5	3.463	BB	0.095	6.04243	9.32109e-1	0.0741
6	5.301	BB	0.092	12.69338	2.15047	0.1557
7	12.772	BB	0.195	7.94127	5.94276e-1	0.0974
8	13.651	BV	0.209	17.10705	1.23018	0.2098
9	13.966	VV	0.166	6.60459	5.74364e-1	0.0810
10	14.388	VV	0.222	17.97513	1.14599	0.2204
11	15.144	VV	0.165	11.92054	1.08854	0.1462
12	16.114	VV	0.225	20.98298	1.31226	0.2573
13	16.429	VV	0.228	14.51067	9.13243e-1	0.1779

25 ul. loop prefilled.

==========

Acq. Method	: SUPAHD.M	Seq. Line	: -
Acq. Operator	: suhana	Vial	: 1
Injection Date	: 30/8/96 14:33:27	Inj	: -
Sample Name	: ALD5	Inj Volume	: Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAHD.M
(modified after loading)
supah D sample Airlift Trial Day 5



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Area Percent Report

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Sorted by Signal
Multiplier : 1.000000

Signal 1: VWD1 A, Wavelength=254 nm, TT

Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	1.377	BV	0.049	105.66222	31.45602	0.5334
2	1.501	VV	0.134	115.98187	11.33951	0.5855
3	1.998	PB	0.053	59.25343	15.83337	0.2991
4	5.299	BB	0.095	16.66990	2.71772	0.0841
5	13.557	BV	0.156	21.38288	2.03370	0.1079
6	13.901	VV	0.161	8.80200	8.22901e-1	0.0444
7	14.303	VV	0.155	22.48214	2.12962	0.1135
8	14.617	PB	0.115	1.06714	1.45270e-1	0.0054
9	15.051	BB	0.149	46.03314	4.77540	0.2324
10	15.761	BV	0.116	5.99762	8.28643e-1	0.0303
11	16.023	VV	0.194	35.10009	2.62229	0.1772
12	16.334	VV	0.218	23.61929	1.49780	0.1192
13	16.795	VV	0.206	18.75536	1.51485	0.0947

	Chrom	Notes and Comments on Chromatograms
5		**Reproducibility of sample processing through Empore disk. Triplicate of sample.**
	200	RT spike = 13.77, area = 4.8
	201	RT spike = 13.76, area = 5.96
	202	RT spike = 13.79, area = 5.96
6		**Minimum detection limits of PAH standard through Empore disk**
	212	25 ug/L quantities for each PAH
	219	12.5 ug/L quantities for each PAH
7		**Internal Spike choice**
	88	Lichros. Column with Supah S method. PAH standard at 500 ug/L and Spike at 1000ug/L. 25 ul vol each
		Spike discernible but not integrated. Located between peak no 6 and 7
	89	Lichros. Column with Supah S method. PAH standard at 500 ug/L and Spike at 4000ug/L. 25 ul vol each
		Spike is well separated between peak no 7 and 8. Hence it was used as spike.
		Note. When standards were passed through Empore, as done much later, evidenced that spike is not so
		suitable anymore as the RT shifted and it eluted too close to peak 6.
8		**Calibration Chromatograms. SupahS method for Phenomenax column.**
	112	PAH 500 ug/L. FLD .
	110	PAH 500 ug/L.FLD
	109	PAH 1000ug/L. FLD
	108	PAH 1000ug/L. FLD
	23	PAH 2000ug/L UV-Vis. Vydac column. Supah 9 method
	24	PAH 1000ug/L. UV-Vis. Vydac column. Supah 9 method
	110	PAH 500ug/L. UV-Vis Phenomenax column. SupahS method. Areas comparable
	147	Spike -Decafluorobiphenyl at 40,000ug/L
	148	Spike -Decafluorobiphenyl at 4,000ug/L
9		**Reproducibility of sample and spike through column**
	187	Spike RT =13.32, area =15.639
	190	Spike RT =13.37, area = 13.425

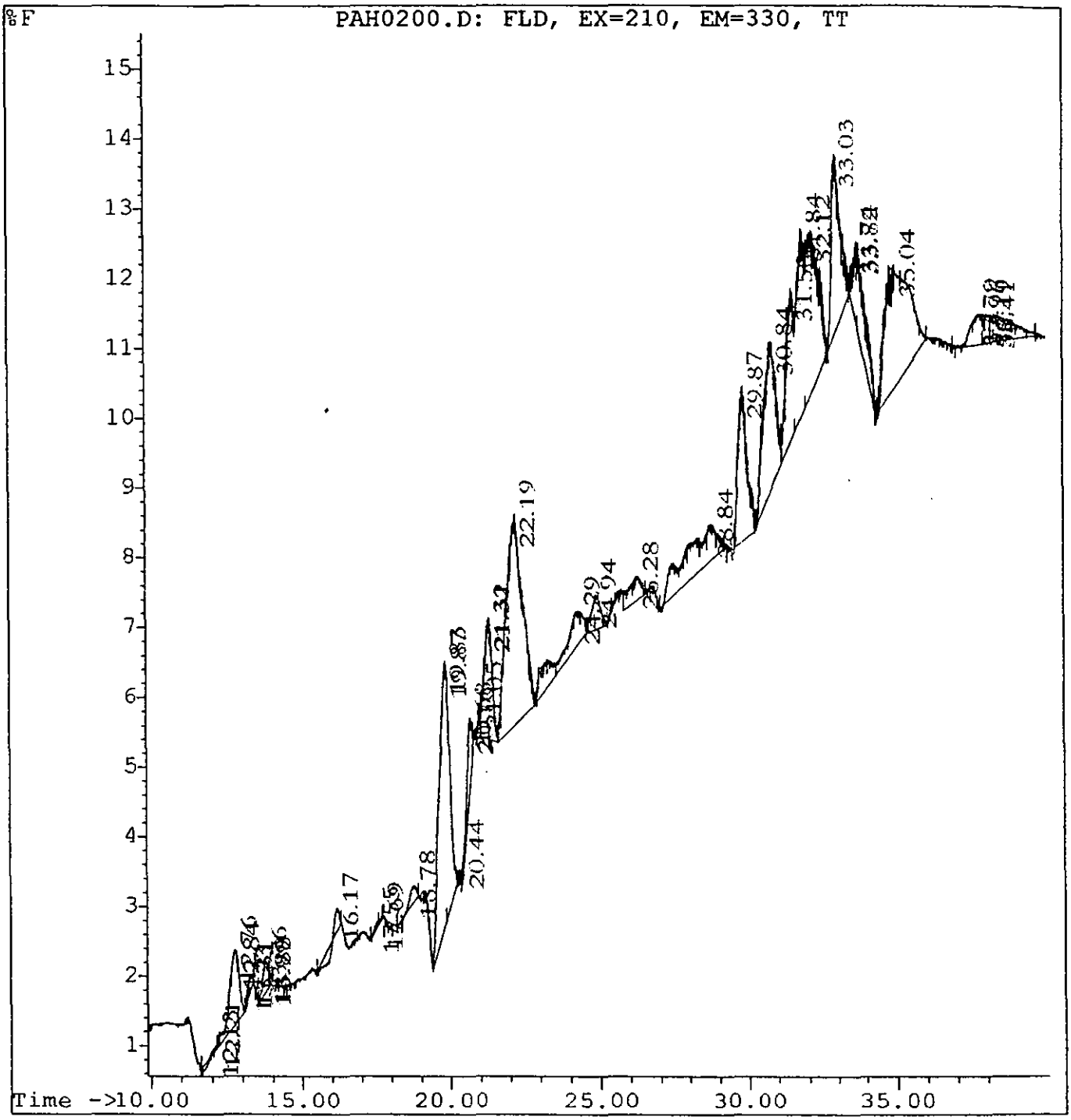
D43 Airlift triplicate sample through empore to check repeatibility of recovery

		1	2	3	range
spike	RT	13.77	13.76	13.79	13.76 - 13.79
	area	4.8	5.36	5.96	4.8 - 5.96
	RT	16.17	16.15	16.17/16.25	16.15 - 16.25
	area	14.78	26.16	27.87	14.78 - 27.87
	RT	19.83	19.86	19.84	19.83 - 19.86
	area	95.23	118.279	123.24	95.23 - 123.24
	RT	22.19	22.19	22.19	22.19
	area	112.4	105.236	118.03	105.24 - 118.03
	RT	29.82	29.84	29.84	29.82 - 29.84
	area	44.35	48.098	42.94	42.94 - 48.1
	RT	33.03	33.01	33.00	33.00 - 33.03
	area	50.68	48.263	43.35	43.35 - 50.68

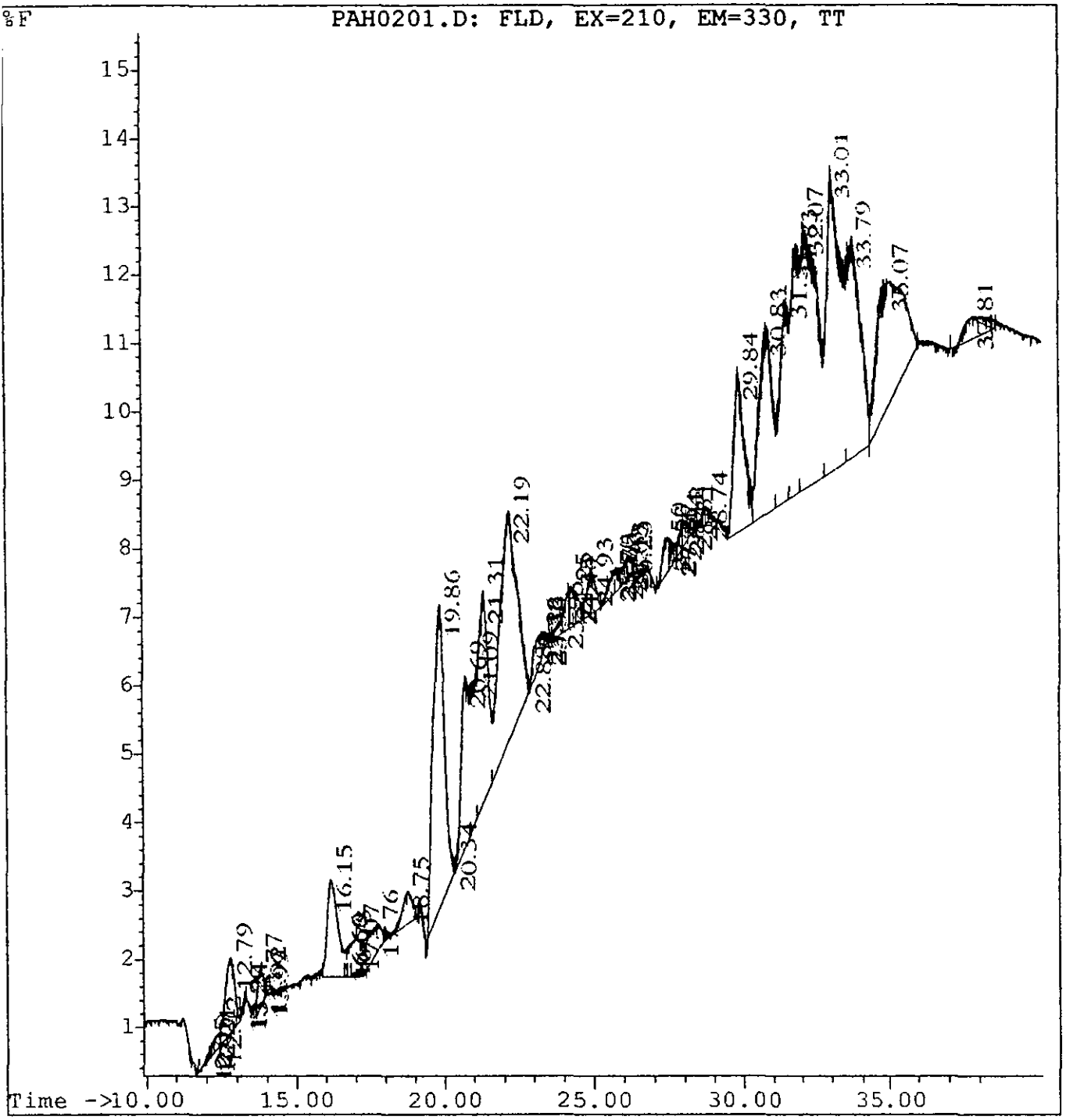
Recovery of spike
at 40,000 mg/L area = 27.36

RT	13.77	13.76	13.79
area	4.8	5.36	5.96
% recovery	17.54	19.59	21.78

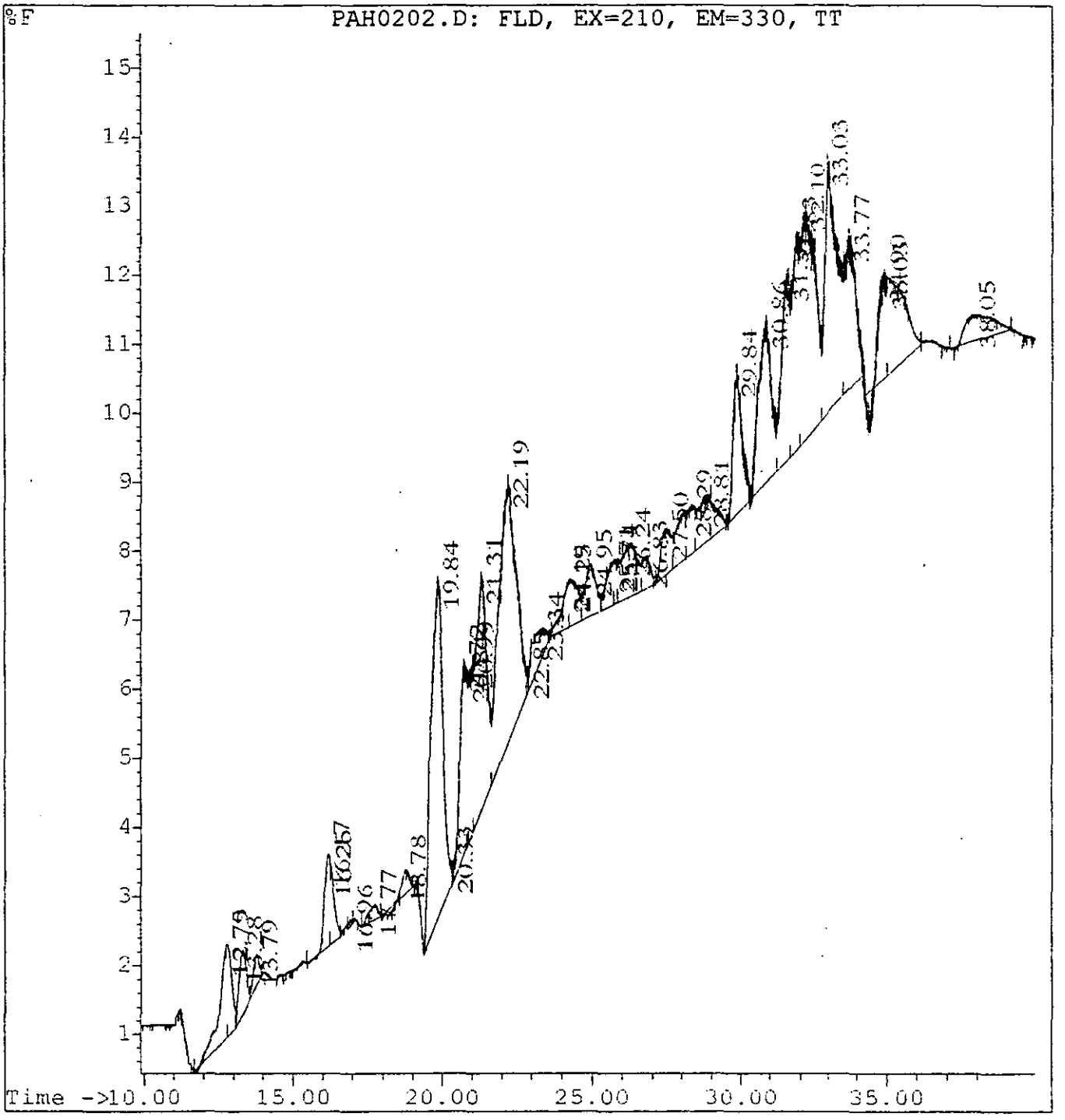
File: A:\PAH0200.D
Operator: suhana
Date Acquired: 2/10/96 14:02:21
Method File Name: SUPAHS.M
Sample Name: alift d43 ml #1
Misc Info:
Bottle Number: 1



File: A:\PAH0201.D
Operator: suhana
Date Acquired: 2/10/96 15:05:33
Method File Name: SUPAHS.M
Sample Name: alift d43 ml #2
Misc Info:
Bottle Number: 1



File: A:\PAH0202.D
Operator: suhana
Date Acquired: 2/10/96 16:37:44
Method File Name: SUPAHS.M
Sample Name: alift d43 ml #3
Misc Info:
Bottle Number: 1



Recovery of PAH standard at 12.5 ug/L (12.5ng/ml) and 25 ug/L (25ng/ml) and spike at 2000 mg/L (2mg/ml) through Empore

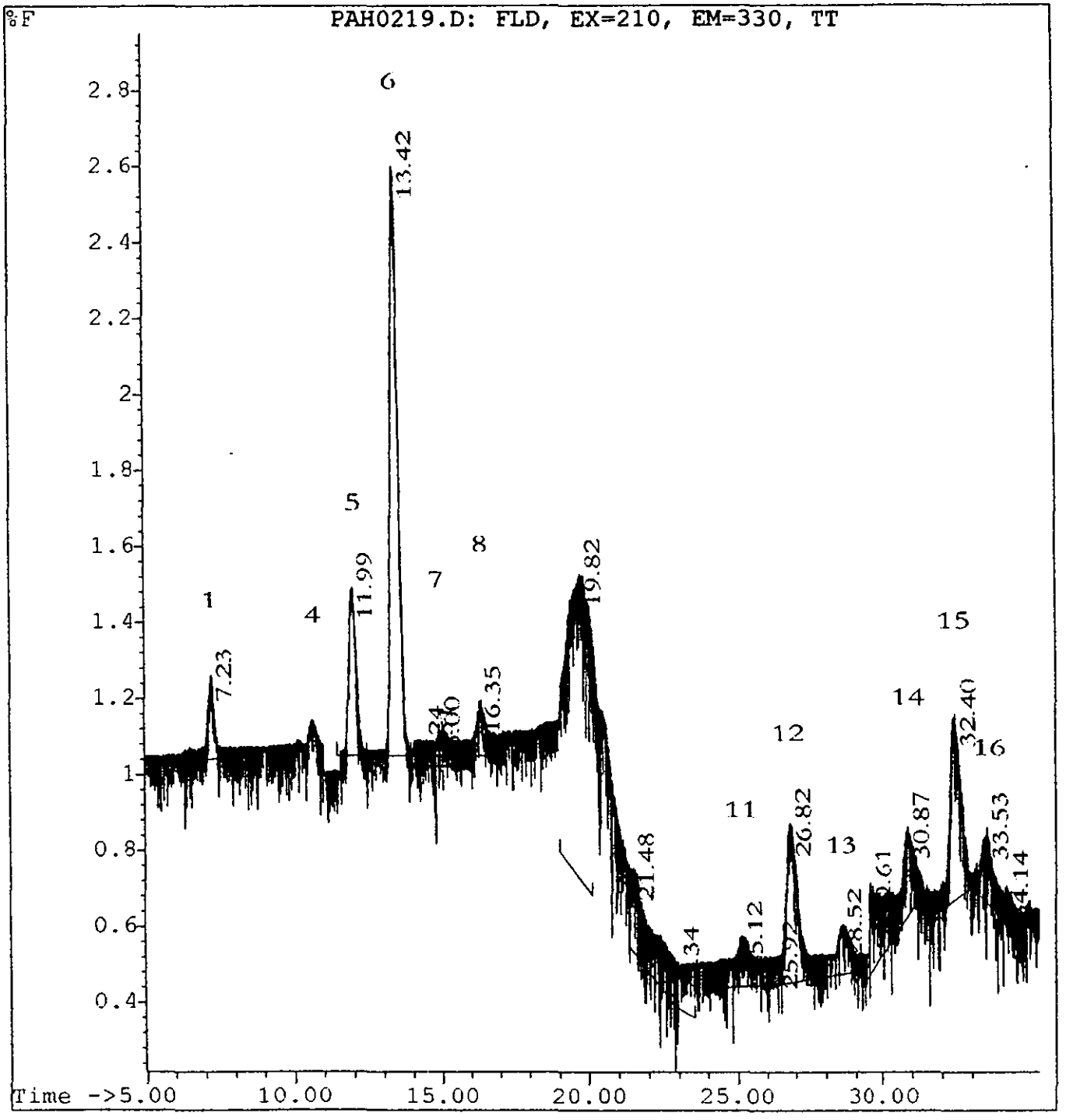
This is to determine if these quantities can be recovered through Empore for detection

12.5 ug/L is close to MDL reported in Standard methods by British Gas with a similar HP System.

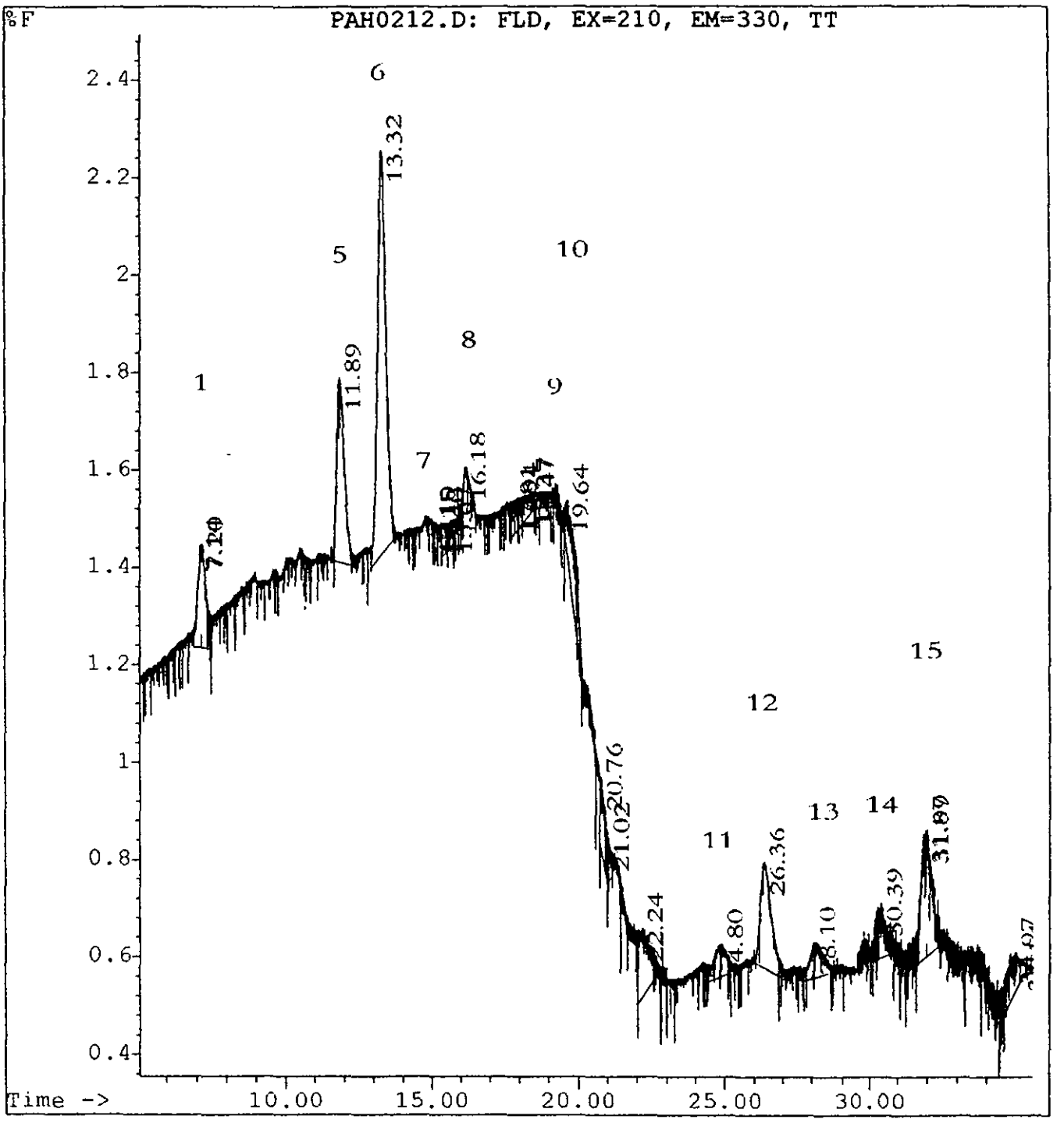
Chromatograms 219 and 212

			219	25ug/L	calculated from theoretical area	212 12.5ug/L		calculated from theoretical a	Reported Limits of
peaks no	name	RT in stds	RT 219	int area 219	based on 1000ug/L std	RT	area	based on 500ug/L std	detection ug/L
1	naphthalene	7.14	7.23	2.82	2.875	7.13/7.2	3.6	1.4	6
3	acenapthene	10.038	nd						14
4	fluorene	10.422	pk not int						7
5	phenanthrene	11.754	11.987	6.52	4.8	11.89	6.77	2.65	6
6	anthracene	13.207	13.416	27.65	12.2	13.322	16.02	5.55	3
7	fluoranthene	14.633	nd			pk not int.			10
8	pyrene	15.929	16.347	2.4	4.25	16.18	2.39	2.04	8
9	B(a) anthracene	20.067	bl jump						11
10	chrysene	20.99	bl jump						14
11	b(b)fluoranthene	24.39	25.117	5.07	4.3	24.8	1.73	2.13	7
12	b(k)fluoranthene	26.118	25.921	1.96	23	26.36	5.65	11.5	4
13	b(a) pyrene	27.748	28.524	4.49	6.2	28.103	2	2.73	23
14	b(a,h) anthracene	30.168	30.87	5.14	2	30.39	1.79	1.27	9
15	b(ghi) perylene	31.733	32.4	11.28	18.3	31.9	6.15	8.96	4
16	indeno(1,2,3cd) pyrene	32.5	33.5	3.88	2.8	ND			8

File: A:\PAH0219.D
Operator: suhana
Date Acquired: 5/10/96 20:26:36
Method File Name: SUPAHS.M
Sample Name: pah & decaf
Misc Info:
Bottle Number: 1



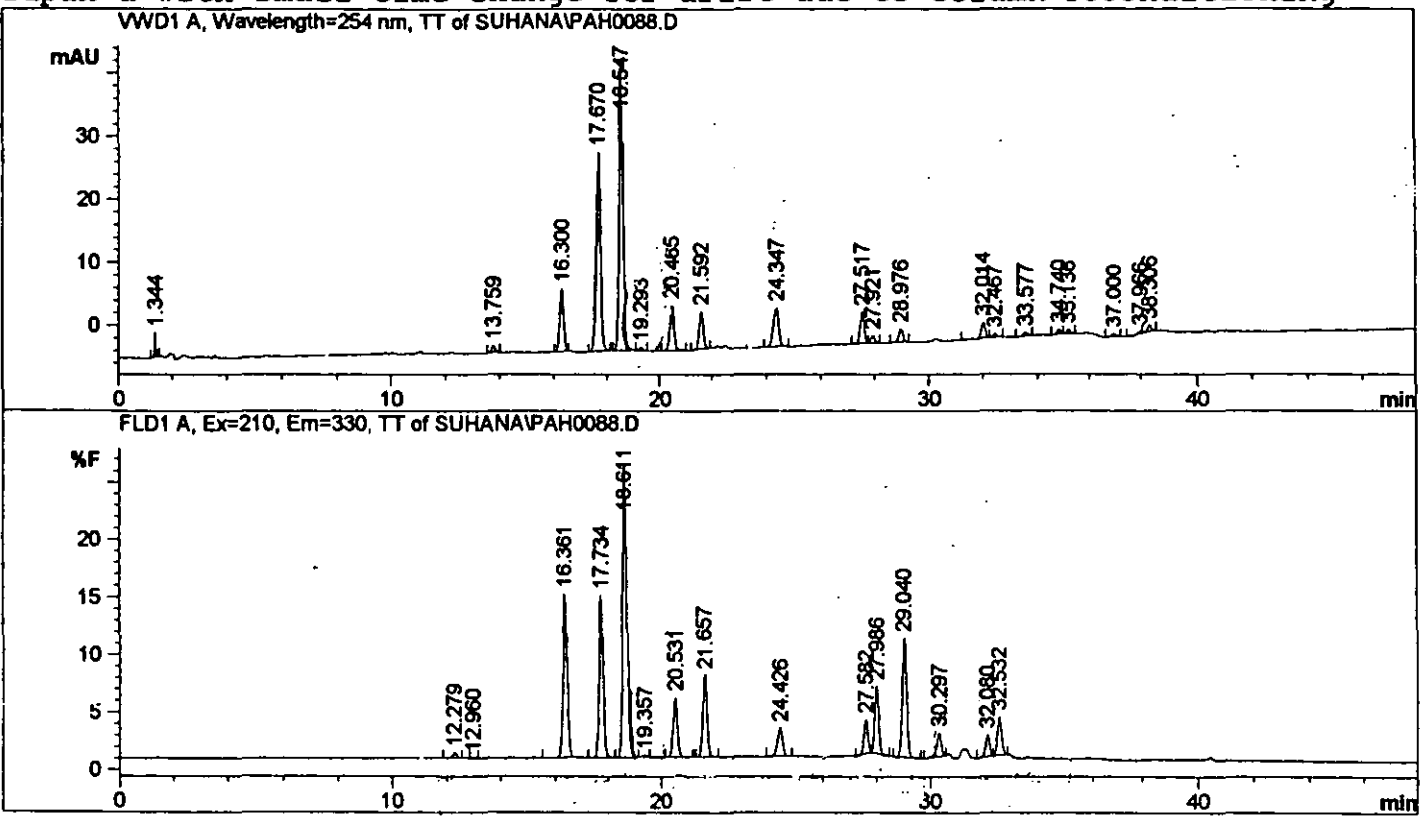
File: A:\PAH0212.D
Operator: suhana
Date Acquired: 4/10/96 14:59:32
Method File Name: SUPAHS.M
Sample Name: pah & decaf
Misc Info:
Bottle Number: 1



25 ul. loop prefilled.new sample

Acq. Method	: SUPAHS.M	Seq. Line	: -
Acq. Operator	: suhana	Vial	: 1
Injection Date	: 9/9/96 15:29:36	Inj	: -
Sample Name	: pah 500 & decaf	Inj Volume	: Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAHS.M
supah d with small time change for drift due to column reconditioning



Area Percent Report

Sorted by Signal
Multiplier : 1.000000

Signal 1: VWD1 A, Wavelength=254 nm, TT

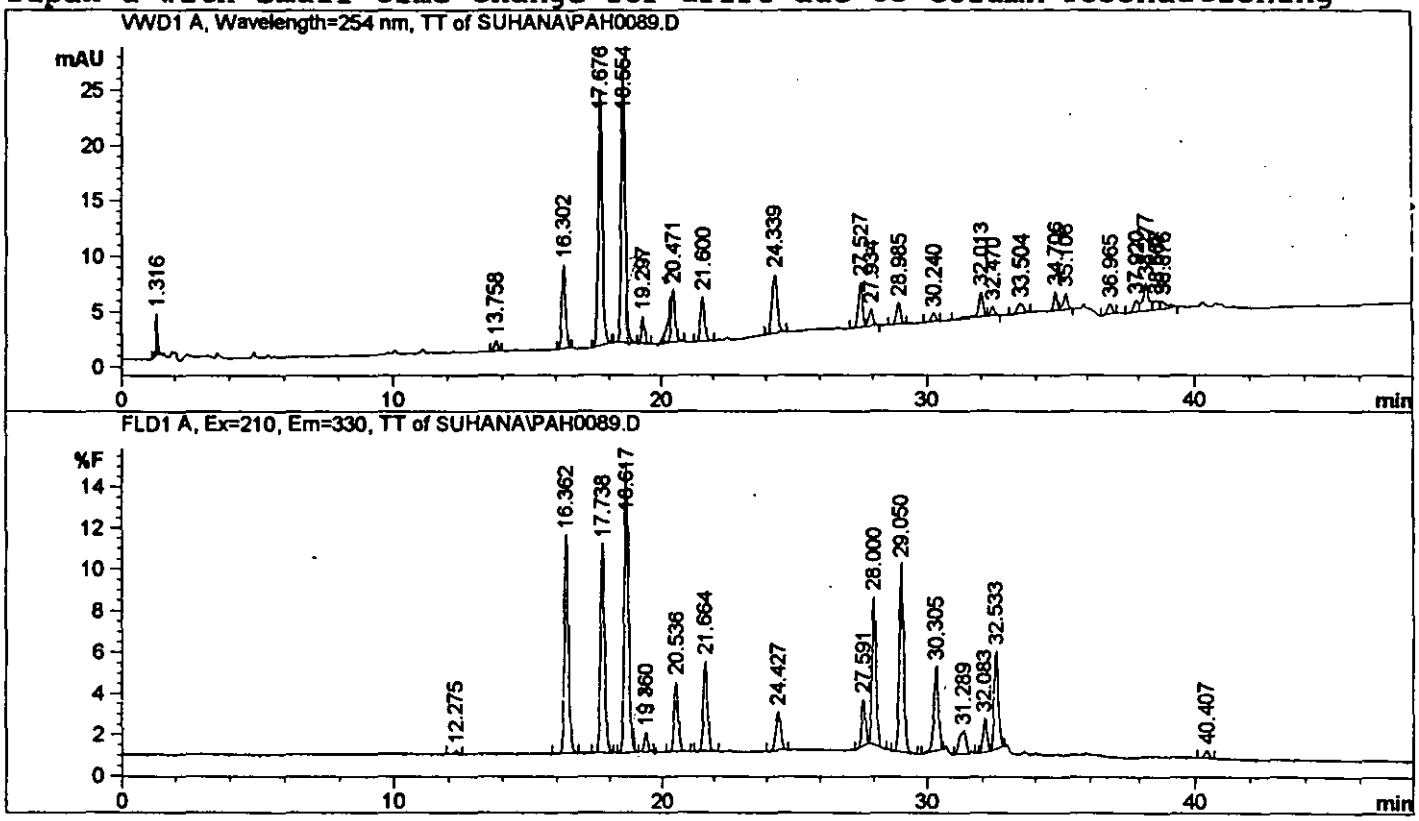
Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	1.344	BB	0.046	12.66413	3.93348	0.9346
2	13.759	BB	0.137	10.52890	1.15198	0.7770
3	16.300	BB	0.155	101.11118	10.06857	7.4616
4	17.670	BB	0.161	330.34067	31.63117	24.3778
5	18.547	BV	0.164	489.65540	45.99976	36.1345
6	19.293	VB	0.149	6.11557	6.24996e-1	0.4513
7	20.465	BB	0.169	79.28398	7.22710	5.8508
8	21.592	BB	0.169	65.45805	6.00677	4.8305
9	24.347	BB	0.229	88.42920	6.18289	6.5257
10	27.517	BV	0.172	56.67387	5.09697	4.1823
11	27.921	VB	0.172	13.59393	1.21610	1.0032
12	28.976	BB	0.168	23.26918	2.15147	1.7172
13	32.014	BV	0.178	29.15948	2.51029	2.1518
14	32.467	VB	0.191	7.15950	5.72421e-1	0.5283

File C:\HPCHEM\1\DATA\SUHANA\PAH0089.D Sample Name: pah 500 & decaf

25 ul. loop prefilled.new sample

Acq. Method	: SUPAHS.M	Seq. Line	: -
Acq. Operator	: suhana	Vial	: 1
Injection Date	: 9/9/96 17:04:52	Inj	: -
Sample Name	: pah 500 & decaf	Inj Volume	: Unknown

Analysis Method : C:\HPCHEM\1\METHODS\SUPAHS.M
supah d with small time change for drift due to column reconditioning



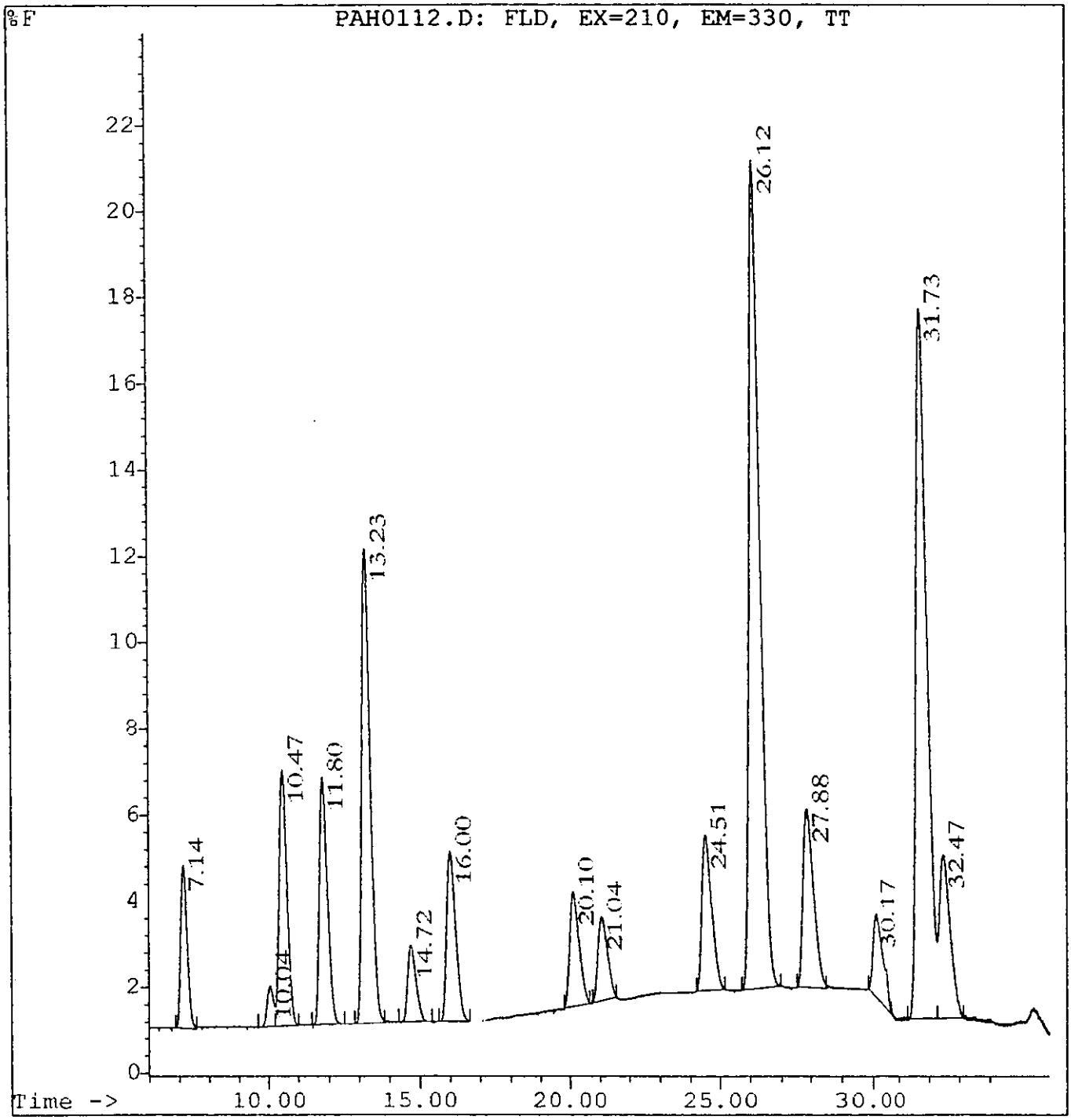
Area Percent Report

Sorted by Signal
Multiplier : 1.000000

Signal 1: VWD1 A, Wavelength=254 nm, TT

Peak #	RT [min]	Type	Width [min]	Area [mAU*sec]	Height [mAU]	Area %
1	1.316	BV	0.042	10.86340	3.77584	1.0160
2	13.758	BB	0.139	8.19570	9.01848e-1	0.7665
3	16.302	BB	0.156	76.29212	7.56762	7.1350
4	17.676	BB	0.160	240.91306	23.15698	22.5306
5	18.554	BV	0.163	269.35248	25.39883	25.1903
6	19.297	VB	0.142	23.04801	2.50248	2.1555
7	20.471	BB	0.167	51.97062	4.82458	4.8604
8	21.600	BB	0.173	45.30183	4.03076	4.2367
9	24.339	BB	0.231	76.59452	5.29838	7.1632
10	27.527	BV	0.171	45.08754	4.05957	4.2167
11	27.934	VB	0.171	16.61560	1.49190	1.5539
12	28.985	BB	0.167	20.92167	1.95080	1.9566
13	30.240	BB	0.171	8.39376	7.58953e-1	0.7850
14	32.013	BV	0.207	31.83551	2.24341	2.9773

File: A:\PAH0112.D
Operator: suhana
Date Acquired: 13/9/96 19:44:03
Method File Name: SUPAHS.M
Sample Name: pah 500
Misc Info:
Bottle Number: 1



Area Report

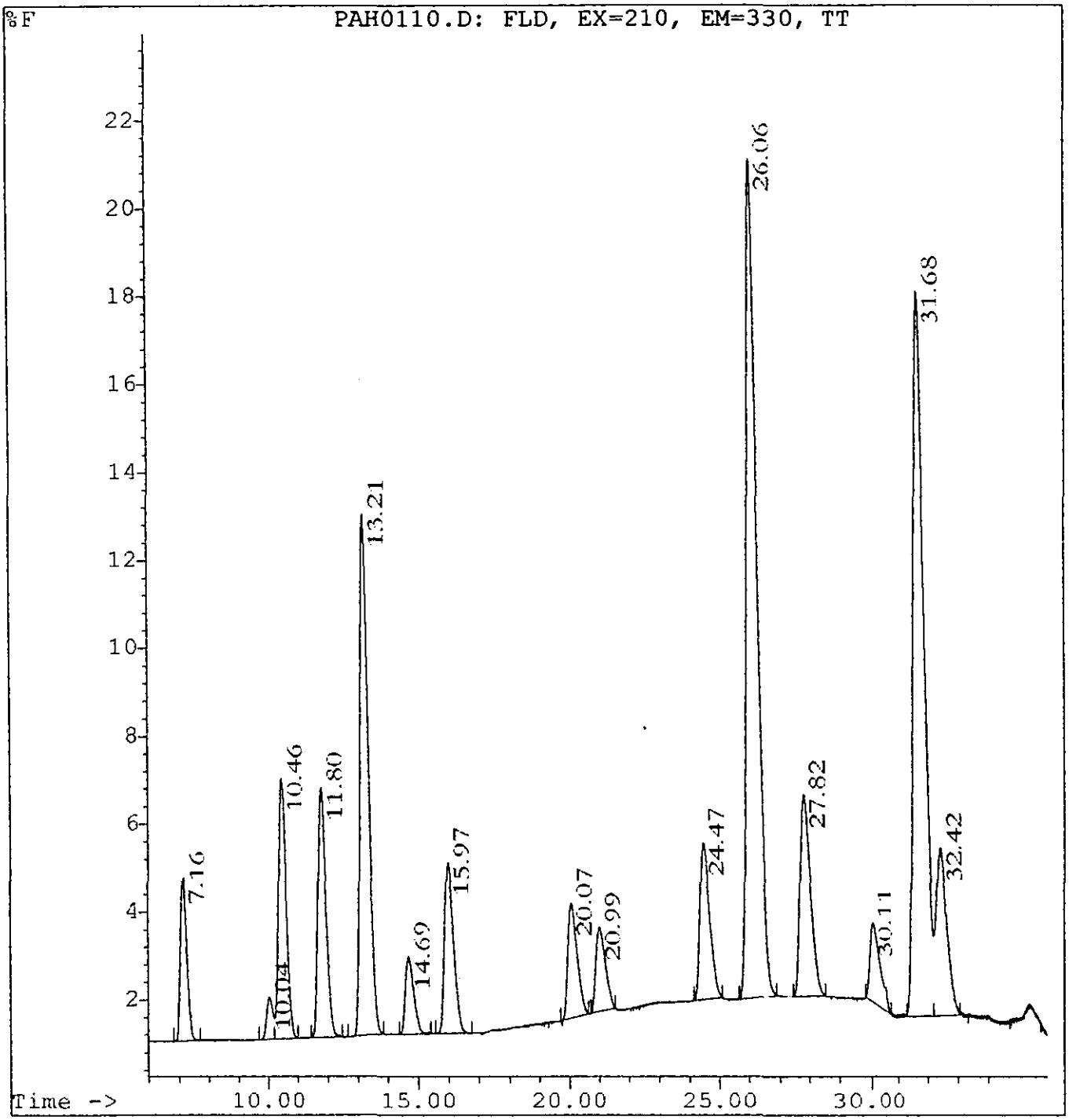
Data File Name : A :\PAH0112.D
Operator : suhana
Acquired on : 3/9/96 19:44
Sample Name : pah 500
Run Time Bar Code: :
Instrument Method: SUPAHS.M
Analysis Method : DEFAULT.M

FLD, EX=210, EM=330, TT

Pk#	Ret Time	Area	Height	Type	Width
1	7.141	57.704	3.787	BV	0.186
2	10.038	14.102	0.953	BV	0.182
3	10.474	105.062	5.921	VV	0.214
4	11.802	105.747	5.758	BB	0.219
5	13.225	213.417	11.012	BV	0.232
6	14.715	34.346	1.773	BB	0.232
7	16.002	81.984	3.952	BV	0.254
8	20.101	57.25	2.647	BB	0.265
9	21.037	41.725	1.943	BB	0.273
10	24.513	83.547	3.593	BB	0.284
11	26.118	459.666	19.202	BB	0.289
12	27.883	102.565	4.138	BB	0.304
13	30.167	52.483	1.937	BV	0.322
14	31.733	411.983	16.432	BV	0.3
15	32.470	95.194	3.773	VV	0.303

Total area = 1917

File: A:\PAH0110.D
Operator: suhana
Date Acquired: 13/9/96 18:37:27
Method File Name: SUPAHS.M
Sample Name: pah 500
Misc Info:
Bottle Number: 1



Area Perc ent Report

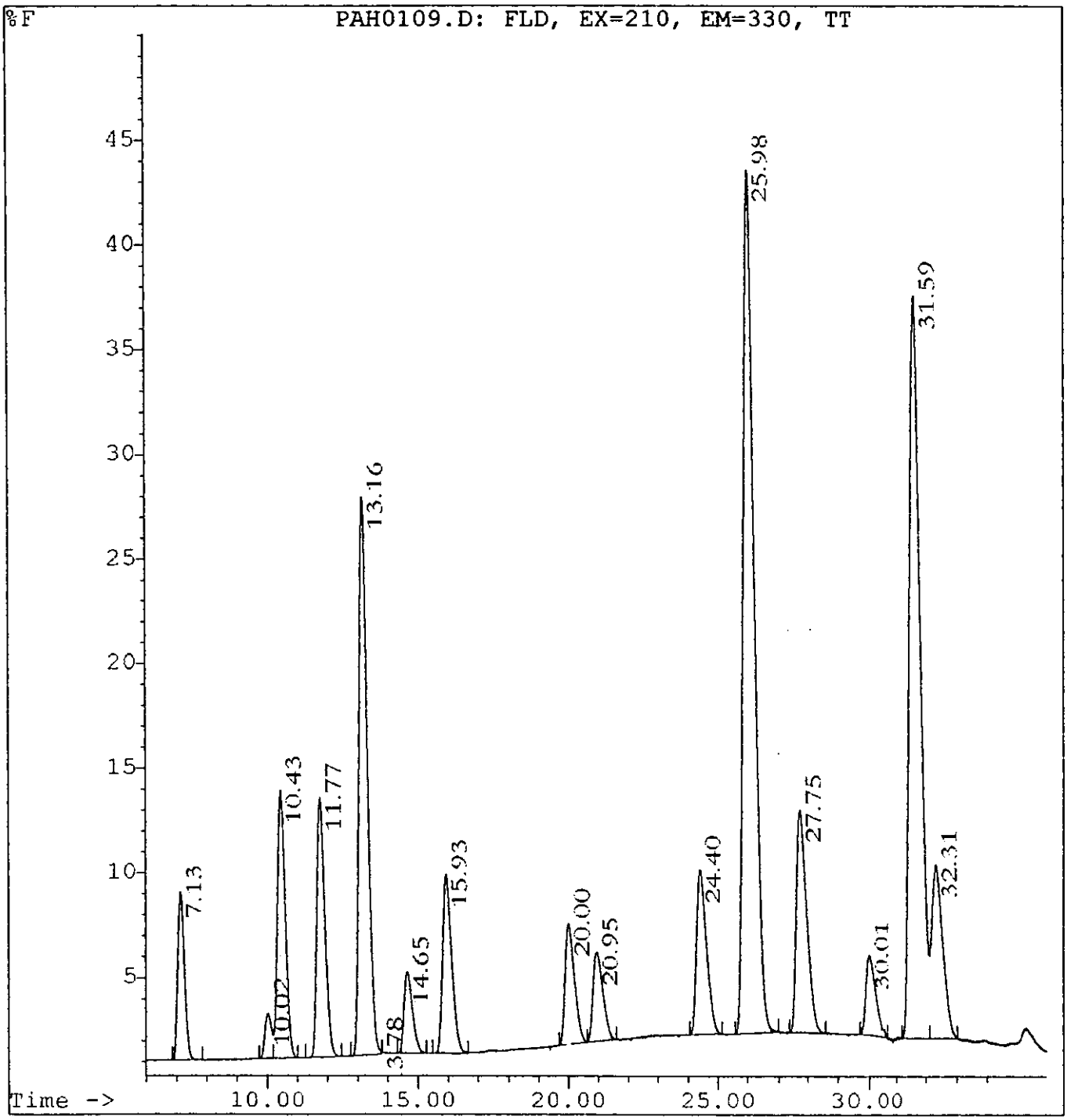
Data File Name : A:\ PAH0110.D
Operator : suhana
Acquired on : 13/9 /96 18:37:2
Sample Name : pah 500
Run Time Bar Code:
Instrument Method: SUPA HS.M
Analysis Method : DEFA ULT.M

VWD, Wavelength=254 nm TT

Pk#	Ret Time	Area	Height	Type	Width
1	7.090	18.522	1.122	BB	0.216
2	8.162	10.466	0.662	BB	0.204
3	9.955	5.701	0.386	BV	0.182
4	10.399	76.576	4.364	VB	0.257
5	11.722	195.349	10.793	BV	0.278
6	13.133	411.014	21.607	PV	0.29
7	14.615	47.198	2.427	PV	0.294
8	15.907	42.691	1.909	PV	0.327
9	19.999	112.134	5.196	BV	0.327
10	20.937	179.142	7.946	VB	0.341
11	24.402	133.263	5.562	BB	0.36
12	25.994	90.465	3.832	BB	0.355
13	27.758	136.509	4.969	BB	0.408
14	30.026	9.356	0.736	BV	0.215
15	31.608	57.618	1.999	BV	0.407
16	32.347	138.914	4.612	VV	0.414

Total area = 1665

File: A:\PAH0109.D
Operator: suhana
Date Acquired: 13/9/96 17:27:14
Method File Name: SUPAHS.M
Sample Name: pah 100
Misc Info:
Bottle Number: 1



Area Percent Report

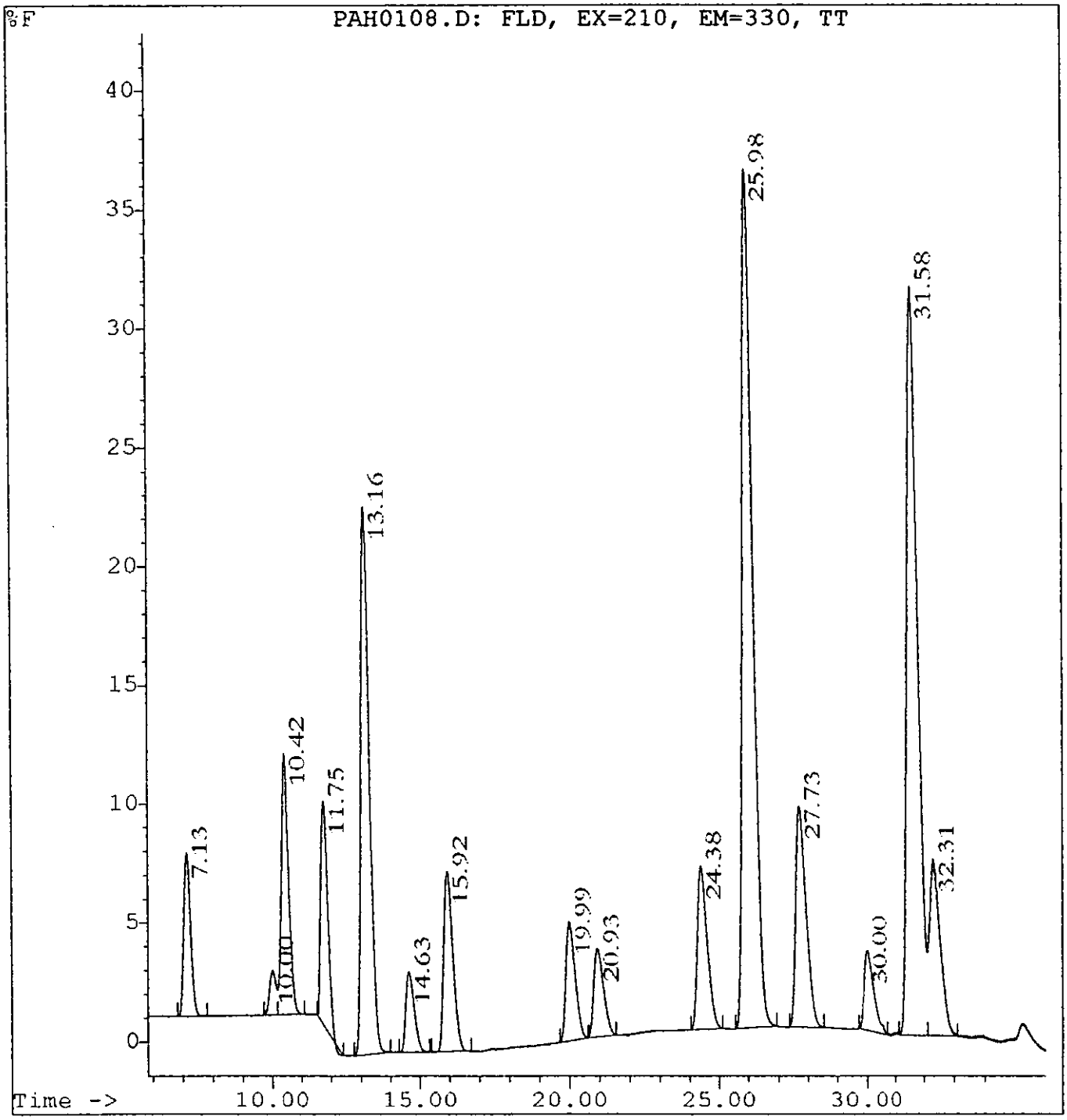
Data File Name : A :\PAH0109.D
Operator : suhana
Acquired on : 1 3/9/96 17:27
Sample Name : Pah 1000
Run Time Bar Code:
Instrument Method: SUPAHS.M
Analysis Method : DEFAULT.M

FLD, EX=210, EM=330, TT.

Pk#	Ret Time	Area	Height	Type	Width
1	7.132	123.768	8.019	BB	0.186
2	10.019	31.747	2.159	BV	0.182
3	10.427	229.154	12.782	VV	0.221
4	11.765	229.238	12.379	BV	0.225
5	13.158	522.341	26.656	BV	0.235
6	13.782	0.129	0.083	PV	0.026
7	14.650	77.424	3.922	BV	0.234
8	15.929	180.641	8.515	BV	0.252
9	20.005	125.595	5.788	BV	0.263
10	20.946	95.707	4.266	VB	0.269
11	24.397	183.063	7.831	BB	0.284
12	25.983	985.764	41.088	BB	0.284
13	27.748	261.391	10.601	BB	0.293
14	30.014	90.084	3.791	BV	0.283
15	31.593	880.315	35.4	BV	0.298
16	32.314	204.76	8.309	VV	0.291

Total area = 4221

File: A:\PAH0108.D
Operator: suhana
Date Acquired: 13/9/96 15:53:14
Method File Name: SUPAHS.M
Sample Name: pah 100
Misc Info:
Bottle Number: 1



Area Perce nt Report

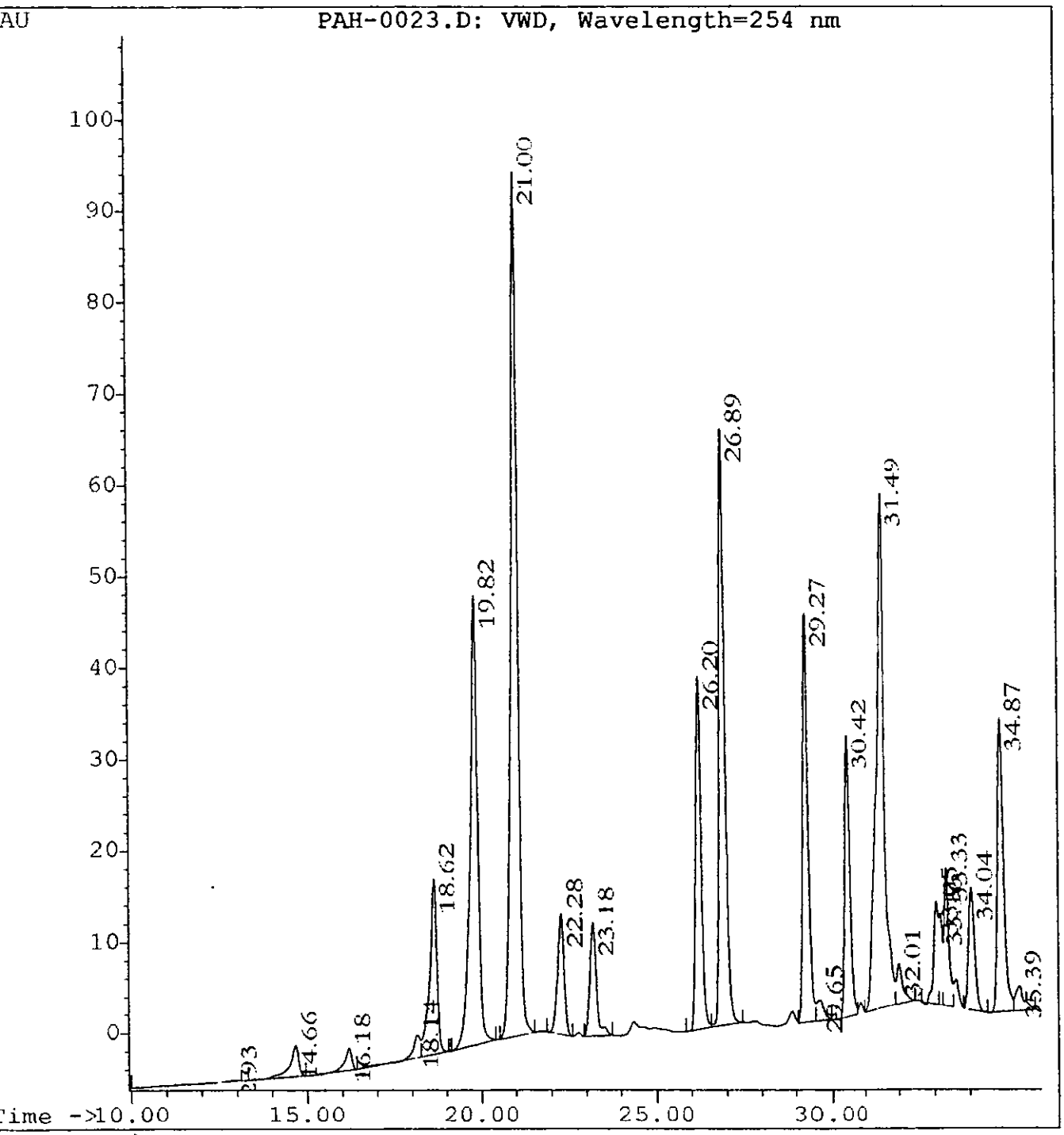
Data File Name : A:\PAH0108.D
Operator : suhana
Acquired on : 13/9/96 15:53:14
Sample Name : pah 1000
Run Time Bar Code:
Instrument Method: SUPAHS.M
Analysis Method : DEFAULT.M

FLD, EX=210, EM=33 0, TT

Pk#	Ret Time	Area	Height	Type	Width
1	7.126	108.731	6.838	BB	0.195
2	9.999	28.123	1.865	BV	0.181
3	10.422	199.95	11.022	VV	0.217
4	11.754	153.635	9.409	BV	0.197
5	13.155	454.796	23.073	PB	0.237
6	14.633	67.242	3.391	BB	0.238
7	15.922	158.544	7.571	BB	0.252
8	19.991	108.391	5.020	BB	0.265
9	20.927	82.723	3.730	BB	0.272
10	24.381	159.127	6.858	BB	0.281
11	25.977	860.917	36.105	BB	0.283
12	27.729	228.816	9.279	BB	0.298
13	30.005	81.261	3.361	BV	0.293
14	31.585	784.019	31.465	VV	0.305
15	32.310	181.367	7.442	VV	0.291

Total area = 3658

File: A:\SUHANA\PAH-0023.D
Operator: SUHANA
Date Acquired: Mon Apr 19 12:48:49 1993
Method File Name: SUPAH9.M
Sample Name: PAH.STD.2000mg/l
Misc Info:
Bottle Number: 1



Area Report

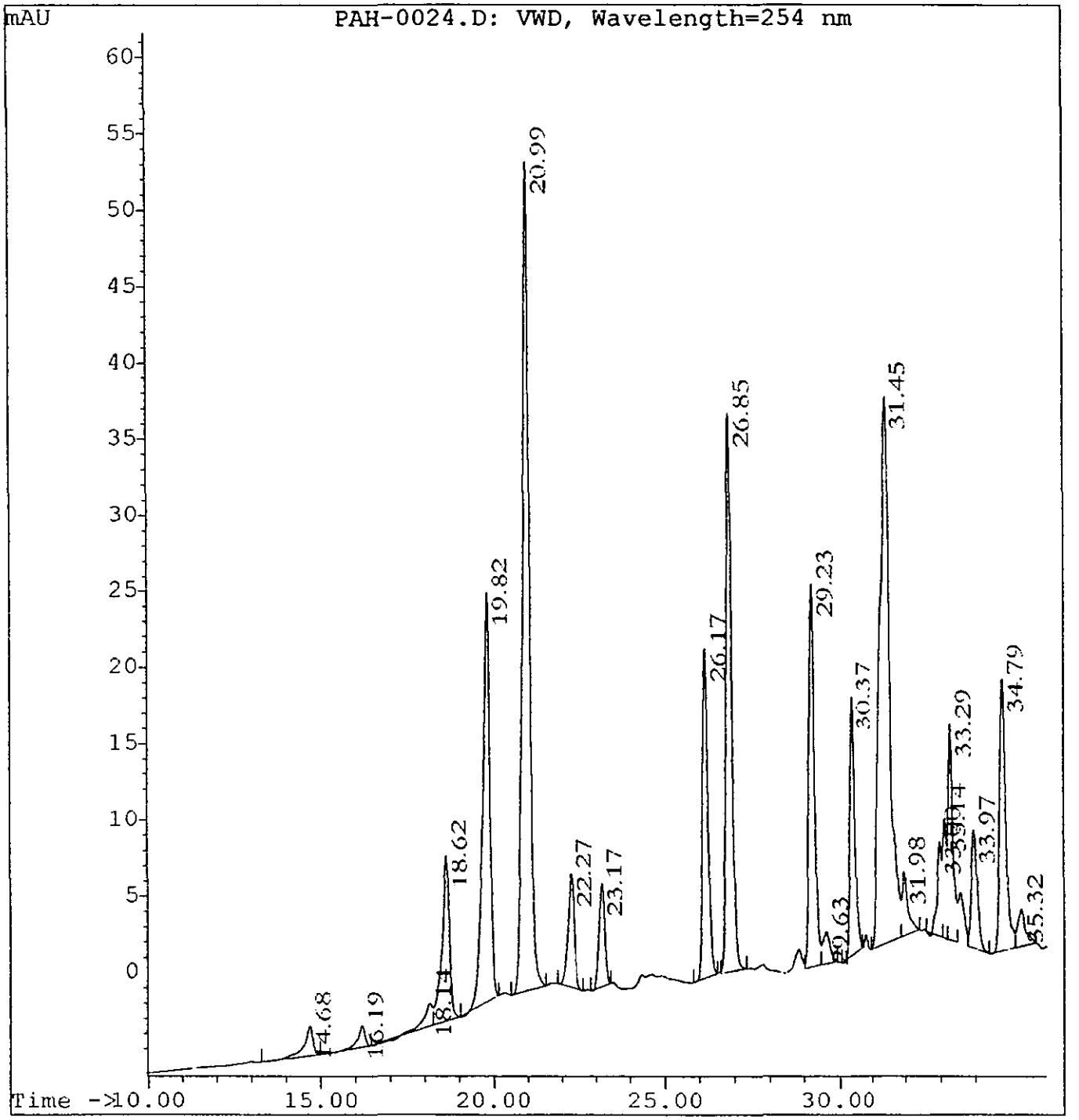
Data File Name : A:\SUHANA\PAH-0023.D
Operator : SUHANA
Acquired on : Mon Apr 19 12:48:49 1993
Sample Name : PAH.STD.2000mg/l
Run Time Bar Code:
Instrument Method: SUPAH9.M
Analysis Method : DEFAULT.M

VWD, Wavelength=254 nm

Pk#	Ret Time	Area	Height	Type	Width
1	14.658	59.552	3.406	BV	0.244
2	16.180	32.85	2.382	PV	0.2
3	18.140	35.582	2.452	PV	0.205
4	18.625	278.835	19.276	VB	0.206
5	19.824	720.822	49.289	BB	0.209
6	21.003	1319.464	94.626	BB	0.203
7	22.283	168.707	13.313	BV	0.189
8	23.184	163.81	12.509	BB	0.198
9	26.204	432.5	38.712	BV	0.173
10	26.892	723.799	65.373	VB	0.171
11	29.274	477.946	44.764	VV	0.164
12	29.653	29.773	2.310	VB	0.188
13	30.418	326.515	30.876	BV	0.161
14	31.495	980.711	56.410	VV	0.246
15	32.011	53.623	4.489	VB	0.169
16	33.054	97.578	11.235	BV	0.129
17	33.160	65.201	10.144	VV	0.107
18	33.331	141.297	15.135	VV	0.136
19	34.043	159.469	13.462	VB	0.184
20	34.667	390.492	32.190	BV	0.186
21	35.386	45.713	2.776	VB	0.222

Total area = 6704

File: A:\SUHANA\PAH-0024.D
Operator: SUHANA
Date Acquired: Mon Apr 19 13:47:01 1993
Method File Name: SUPAH9.M
Sample Name: PAH.STD.1000mg/l
Misc Info:
Bottle Number: 1



Area Report

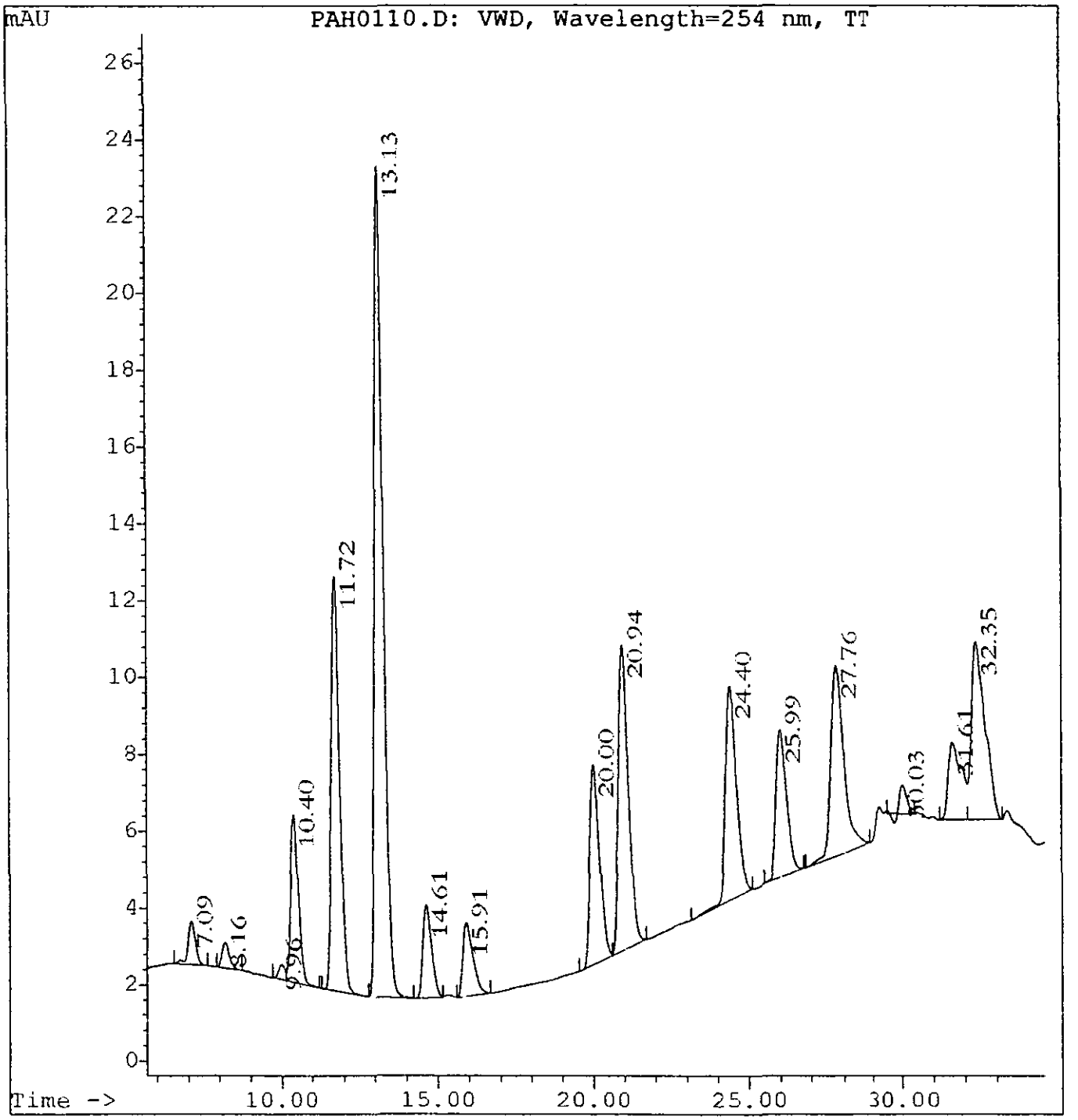
Data File Name : A:\SUHANA\PAH-0 024.D
Operator : SUHANA
Acquired on : Mon Apr 19 13:4 7:01 1993
Sample Name : PAH.STD.1000mg/ l
Run Time Bar Code:
Instrument Method: SUPAH9.M
Analysis Method : DEFAULT.M

VWD, Wavelength=254 nm

Pk#	Ret Time	Area	Height	Type	Width
1	14.682	34.284	1.945	BV	0.246
2	16.193	19.854	1.395	PV	0.204
3	18.140	24.674	1.488	PV	0.229
4	18.624	161.868	10.848	VB	0.211
5	19.816	372.904	26.738	BB	0.201
6	20.991	756.121	54.376	BB	0.202
7	22.266	95.265	7.451	BB	0.19
8	23.166	78.841	6.746	BB	0.181
9	26.169	236.292	21.562	BB	0.17
10	26.854	399.398	36.579	BB	0.169
11	29.227	266.907	25.047	VV	0.163
12	29.626	28.25	2.091	VB	0.202
13	30.368	175.751	16.921	BV	0.159
14	31.451	743.553	35.834	BV	0.291
15	31.975	50.688	4.212	VB	0.169
16	32.996	54.975	6.210	BV	0.13
17	33.138	55.738	7.819	VV	0.104
18	33.294	134.604	14.123	VV	0.138
19	33.970	91.913	7.696	VB	0.184
20	34.788	219.645	17.768	BV	0.189
21	35.321	38.555	2.407	VB	0.218

Total area = 4040

File: A:\PAH0110.D
Operator: suhana
Date Acquired: 13/9/96 18:37:27
Method File Name: SUPAHS.M
Sample Name: pah 500
Misc Info:
Bottle Number: 1



Area Percent Report

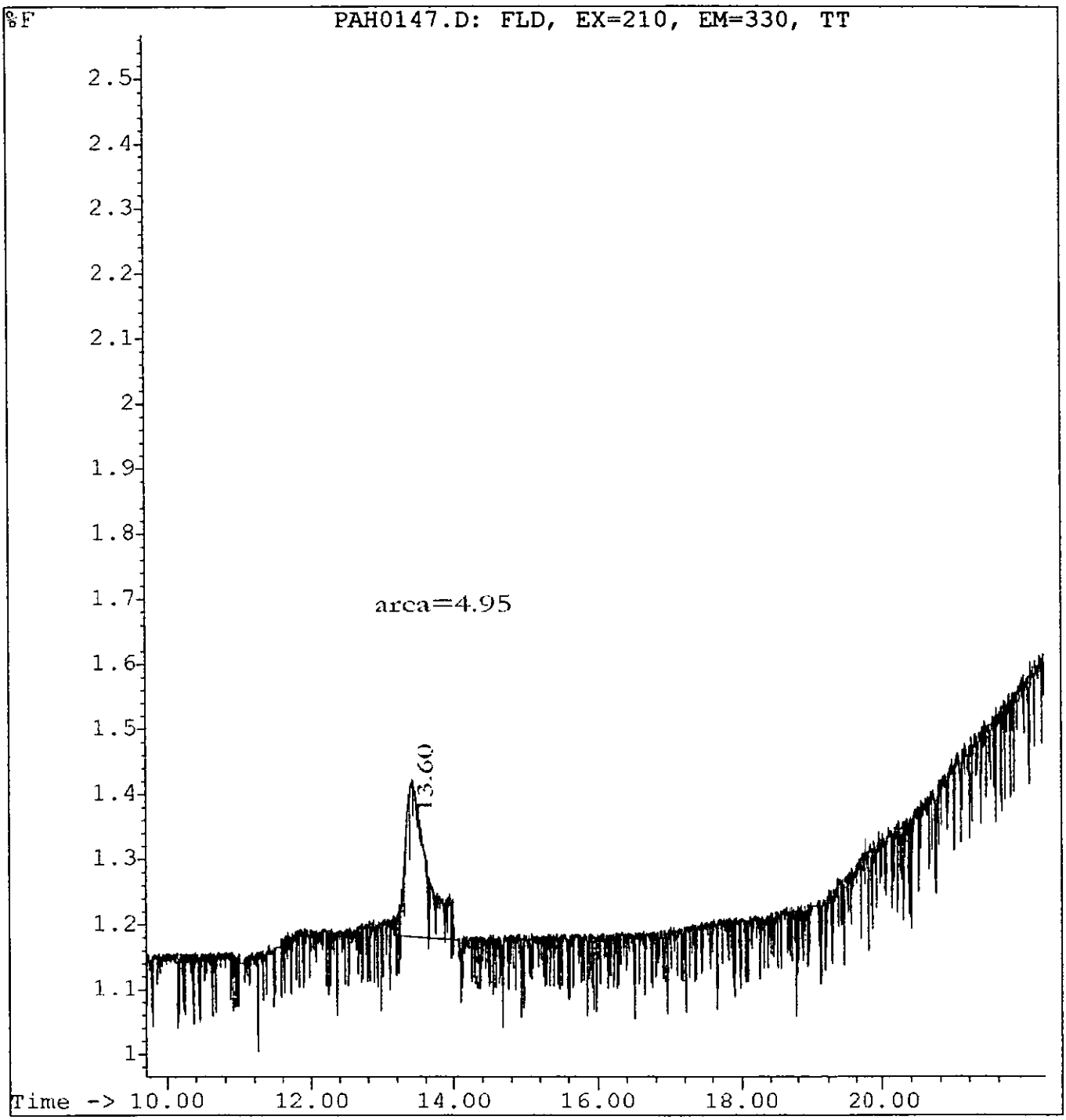
Data File Name : A :\PAH0110.D
Operator : suhana
Acquired on : 13/9/1996 6:37:27 PM
Sample Name : pah 500
Run Time Bar Code:
Instrument Method: SUPAHS.M
Analysis Method : DEFAULT.M

FLD, EX=210, EM=330, TT

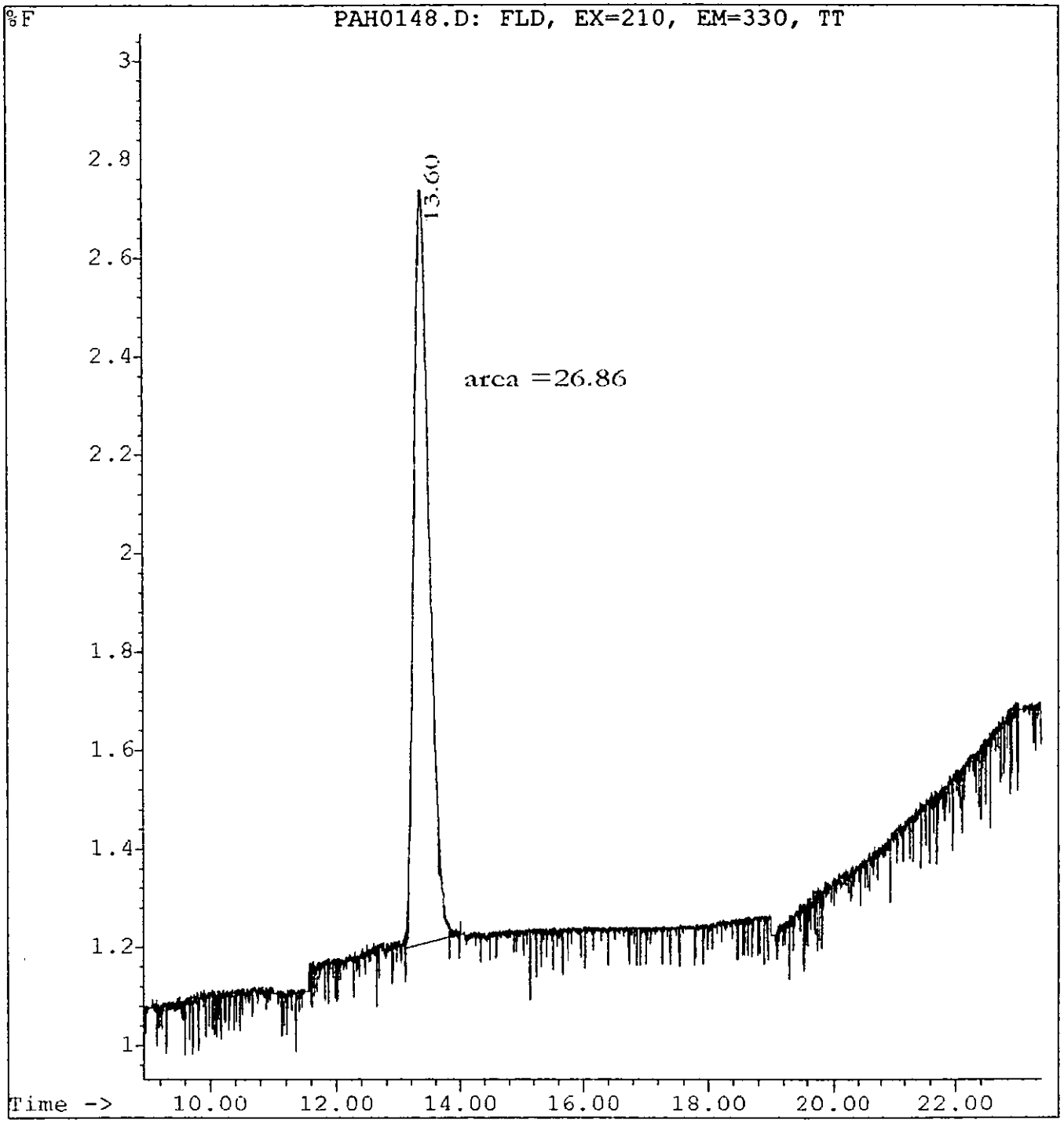
Pk#	Ret Time	Area	Height	Type	Width
1	7.160	56.357	3.712	BB	0.189
2	10.037	14.331	0.969	BV	0.184
3	10.464	105.339	5.929	VV	0.212
4	11.798	105.267	5.692	BV	0.22
5	13.207	229.645	11.822	BV	0.23
6	14.692	33.856	1.77	BB	0.231
7	15.975	80.405	3.898	BB	0.249
8	20.067	56.533	2.619	BB	0.268
9	20.995	41.259	1.92	BB	0.269
10	24.466	82.049	3.554	BB	0.286
11	26.065	455.664	19.075	BB	0.289
12	27.820	112.68	4.569	BB	0.306
13	30.112	47.152	1.818	BV	0.314
14	31.677	410.092	16.46	VV	0.297
15	32.424	95.694	3.817	VV	0.298

Total area = 1926

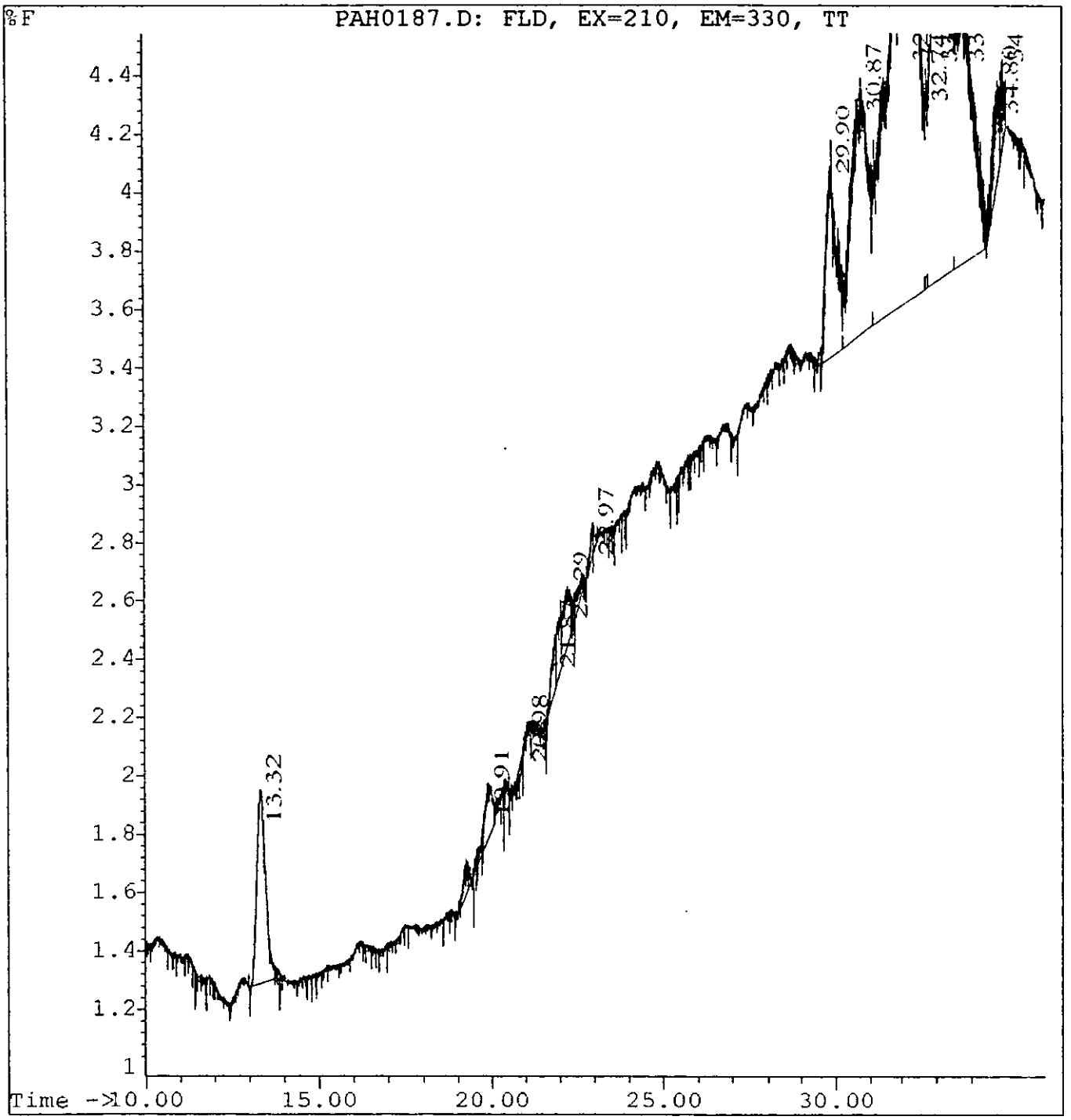
File: A:\PAH0147.D
Operator: suhana
Date Acquired: 20/9/96 15:15:48
Method File Name: SUPAHS.M
Sample Name: decaf4000
Misc Info:
Bottle Number: 1



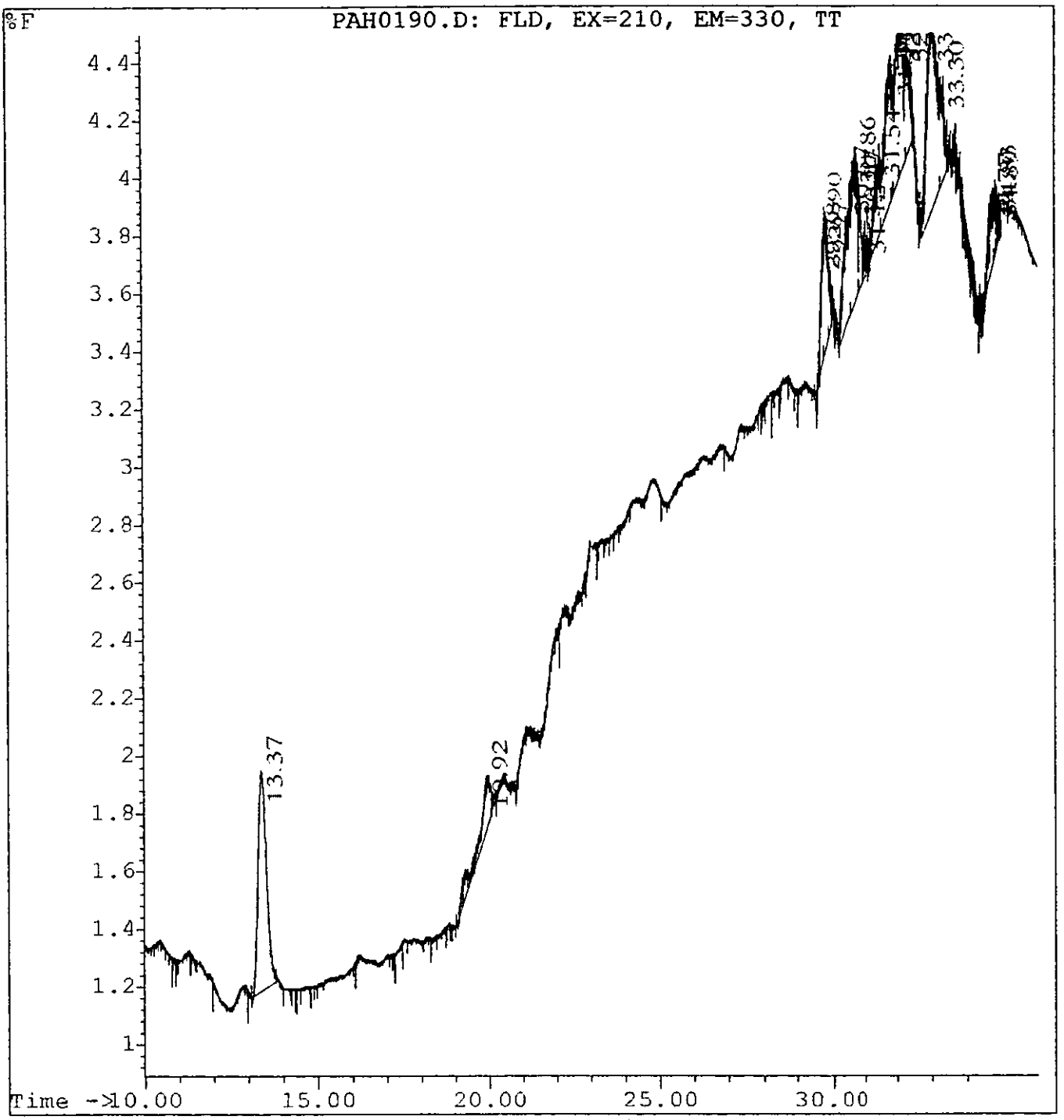
File: A:\PAH0148.D
Operator: suhana
Date Acquired: 20/9/96 16:19:17
Method File Name: SUPAHS.M
Sample Name: decaf40000
Misc Info:
Bottle Number: 1



File: A:\PAH0187.D
Operator: suhana
Date Acquired: 30/9/96 14:31:29
Method File Name: SUPAHS.M
Sample Name: cstr day 58
Misc Info:
Bottle Number: 1



File: A:\PAH0190.D
Operator: suhana
Date Acquired: 30/9/96 16:37:17
Method File Name: SUPAHS.M
Sample Name: cstr day 58
Misc Info:
Bottle Number: 1



Area Report

Data File Name : **A:\PAH0187.D**
Operator : suhana
Acquired on : 30/9/96
Sample Name : cstr day 58
Run Time Bar Code:
Instrument Method: SUPAHS.M
Analysis Method : DEFAULT.M
Instrument FLD
FLD, EX=210, EM=330 , TT

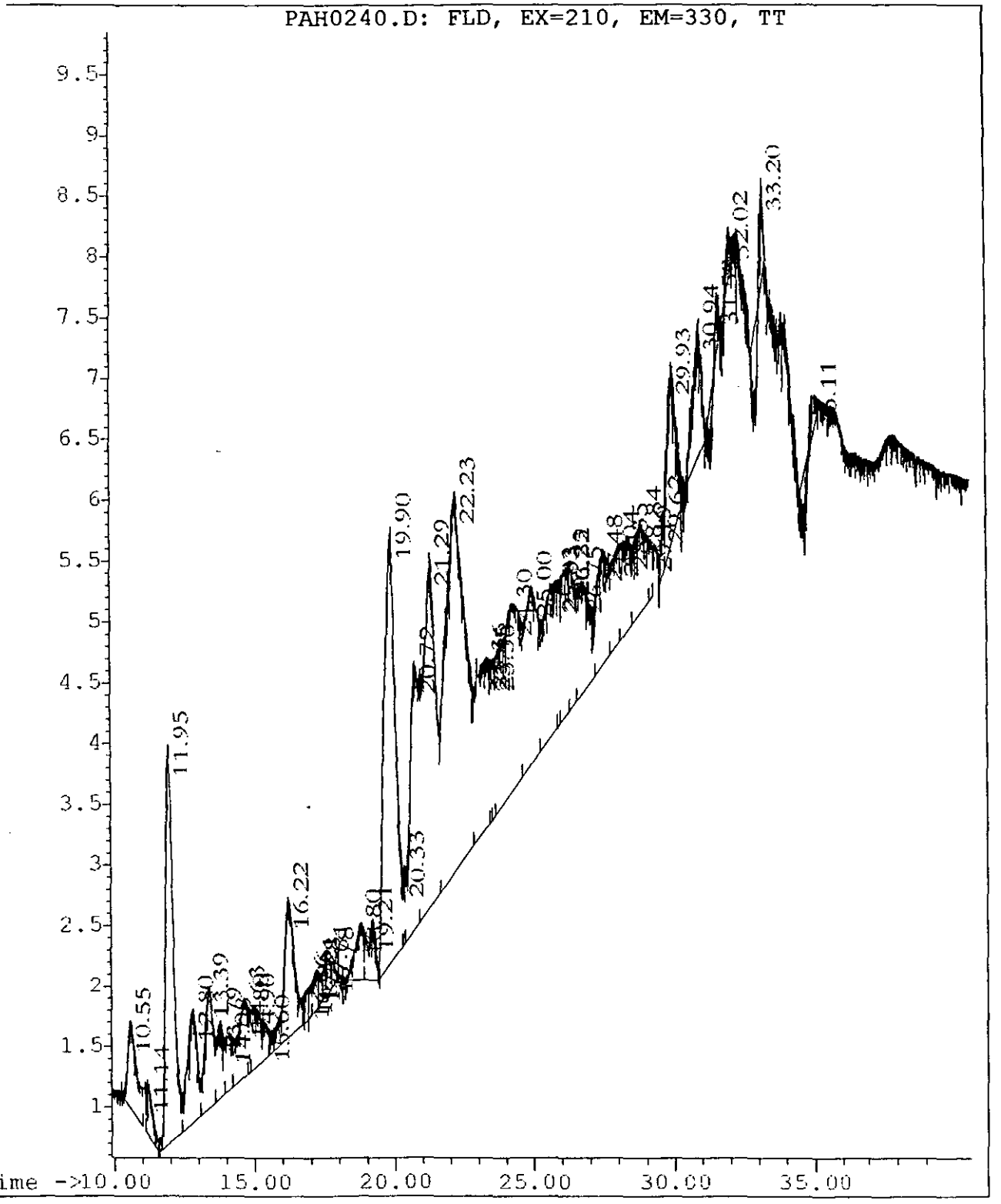
Pk#	Ret Time	Area	Height	Type	Width
9	12.832	2.532	0.118	BV	0.251
10	13.324	15.639	0.748	PV	0.253
11	13.771	0.961	0.126	VV	0.121
29	29.178	1.944	0.099	VB	0.29
30	29.897	10.738	0.572	BB	0.257

Data File Name : **A:\PAH0190.D**
Operator : suhana
Acquired on : 30/9/96
Sample Name : cstr day 58
Analysis Method : DEFAULT.M
Instrument : FLD
FLD, EX=210, EM=330 , TT

Pk#	Ret Time	Area	Height	Type	Width
6	12.979	0.252	0.070	PB	0.059
7	13.372	13.425	0.779	BV	0.205
8	13.801	0.121	0.038	VB	0.042
23	27.436	2.93	0.134	VV	0.314
24	28.735	13.75	0.203	VV	0.806
25	29.216	3.756	0.149	VV	0.331
26	29.858	11.885	0.565	PV	0.279
27	30.226	0.432	0.104	VB	0.069

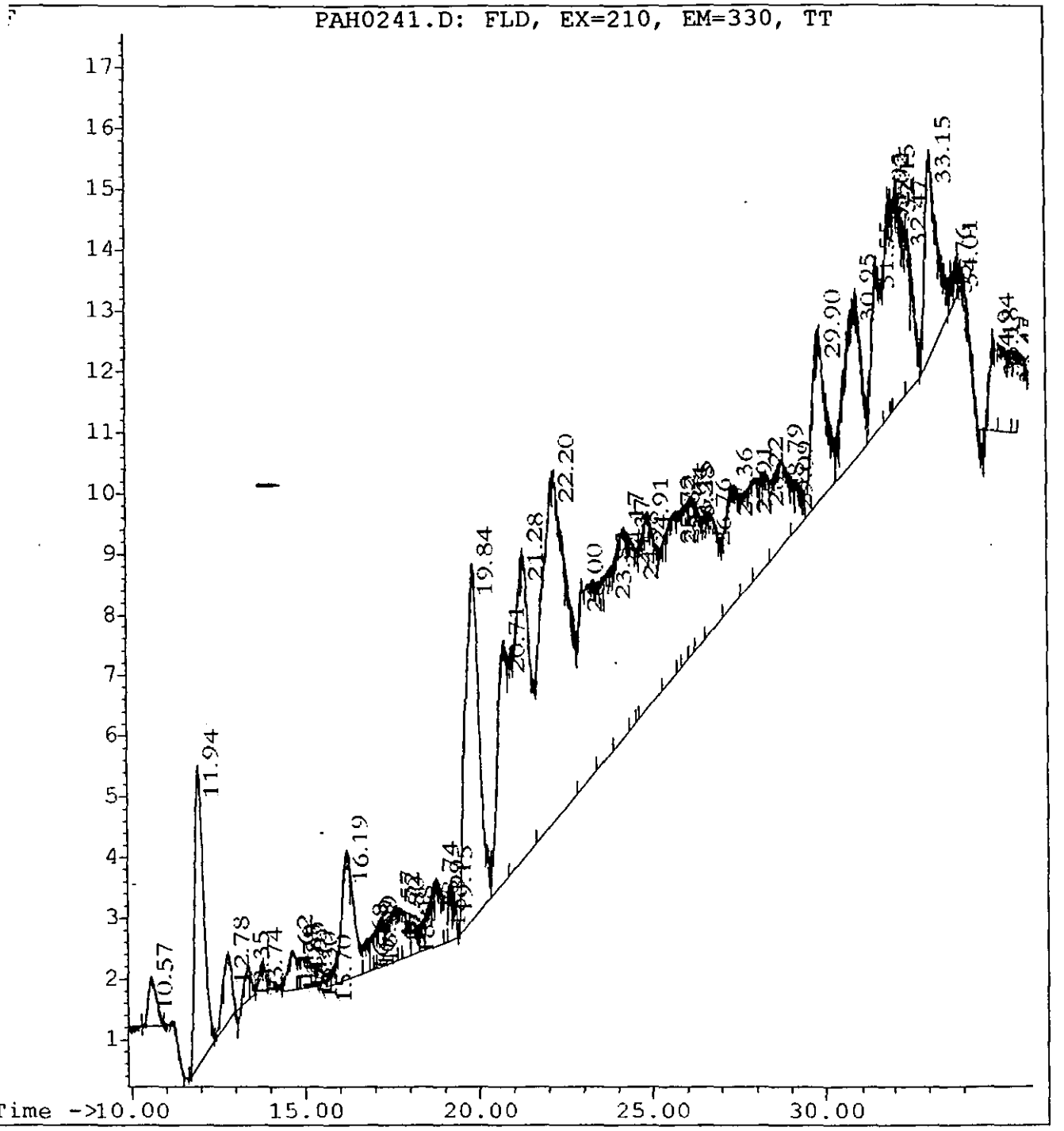
	Baseline 1										
	Sample	baseline 240		Multiplication factor to convert subsampled oil to ng/L							
	O&G/kg	336.1g/kg		PAH =	108419						
	Subsampled	0.0062									
	Concentration O&G in ACN	0.0031g/ml									
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm	UTS
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	**ug/L**		ppm
4	fluorene	8.63	104.85	0.21	214.44	0.21	0.21	40.69459	4412.07	4.41	3.4
5	phenanthrene	65.06	106.37	0.21	190.85	0.19	0.20	322.4064	34954.98	34.95	5.60
6	anthracene	9.66	222.14	0.44	488.58	0.49	0.47	20.7105	2245.41	2.25	3.4
7	fluoranthrene	5	33.89	0.07	144.67	0.14	0.11	47.0699	5103.27	5.10	
8	pyrene	26	81.74	0.16	169.80	0.17	0.17	156.025	16916.07	16.92	8.2
9	benzo(a) anthracene	95	108	0.22	212	0.21	0.21	443.9252	48129.93	48.13	3.4
10	chrysene										4.8
11	benzo(b)fluoranthene	10.7	84.84	0.17	173.90	0.17	0.17	62.28535	6752.92	6.75	
12	*benzo(k)Fluoranthene*	*22.35*	*459.50*	*0.92*	*920.50*	*0.92*	*0.92*	24.30008	2634.59	2.63	
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			0.00	*3.4*
14	dibenzo(a,h)anthracene	39.76	52.54	0.11	78.78	0.08	0.09	432.503	46891.54	46.89	
15	benzo(ghi) perelene	37.76	358.80	0.72	730.90	0.73	0.72	52.13669	5652.61	5.65	
16	Indeno(1,23cd)pyrene	27.37	53.75	0.11	110.89	0.11	0.11	250.6525	27175.49	27.18	

File: A:\PAH0240.D
Operator: suhana
Date Acquired: 9/10/96 12:43:33
Method File Name: SUPAHS.M
Sample Name: baseline .0062
Misc Info:
Bottle Number: 1



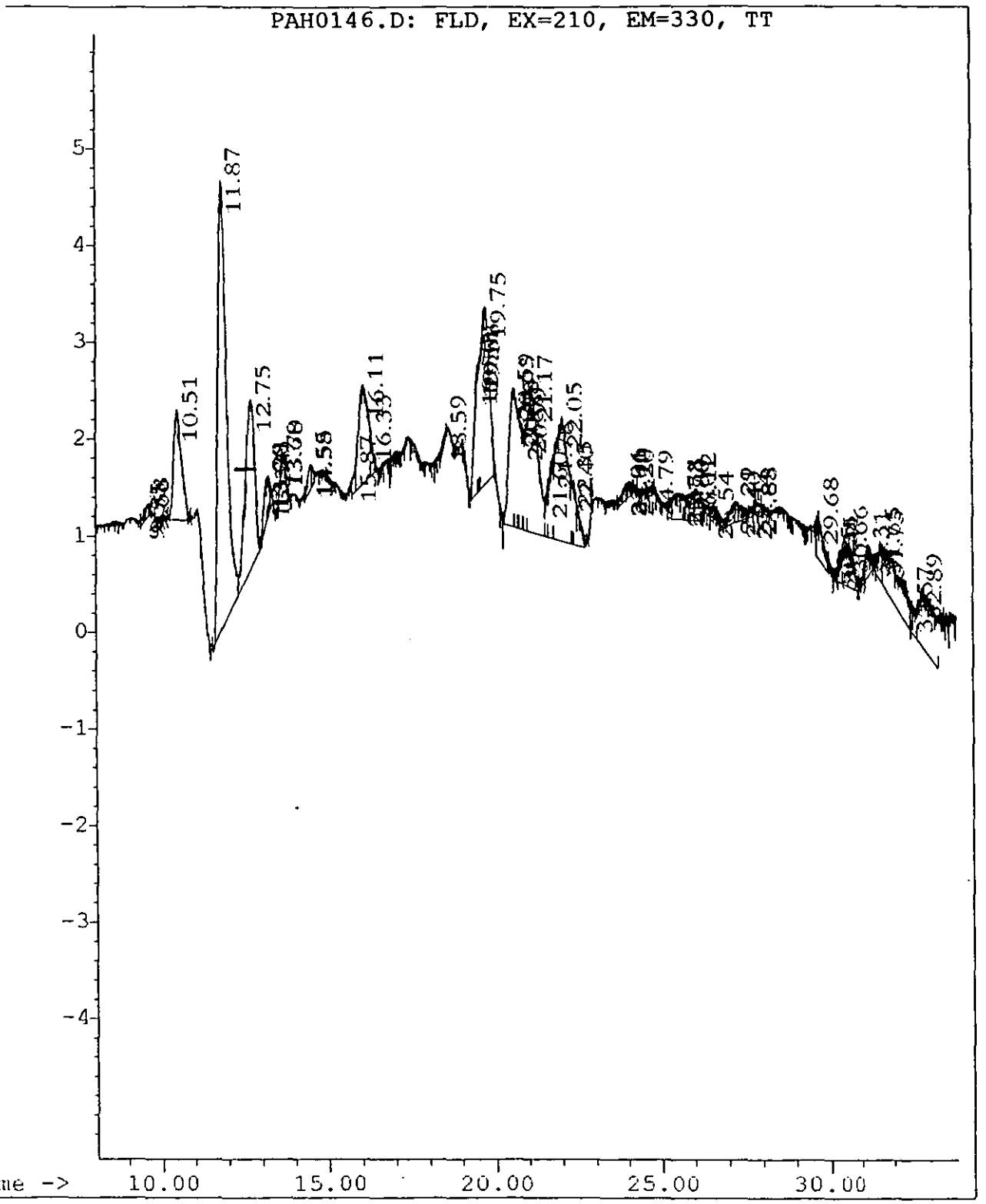
Baseline 2													
Sample	Baseline 241		Multiplication factor to convert subsampled oil to ng/L										
O&G/kg	336.1		PAH =	67220									
Subsampled	0.011												
Concentration O&G in AC	0.005								241	240	unfilt		
	FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000		ppm	254		
Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L	ppm		ppm	average	UTS
Fluorene	13.24	104.85	0.21	214.44	0.21	0.21	62.43295	4196.74	4.20	4.41	14.76	4.31	3.4
phenanthrene	88.04	106.37	0.21	190.85	0.19	0.20	436.2843	29327.03	29.33	34.95	49.97	32.14	5.6
anthracene	16.35	222.14	0.44	488.58	0.49	0.47	35.05349	2356.30	2.36	2.25	2.44	2.31	3.4
fluoranthrene	6.81	33.89	0.07	144.67	0.14	0.11	64.1092	4309.42	4.31	5.10	7.75	4.71	
pyrene	49.06	81.74	0.16	169.80	0.17	0.17	294.4071	19790.05	19.79	16.92		18.36	8.2
benzo(a) anthracene	153	108	0.22	212	0.21	0.21	714.9533	48059.16	48.06	48.13		48.10	3.4
chrysene													4.8
benzo(b)fluoranthene	15.2	84.84	0.17	173.90	0.17	0.17	88.48012	5947.63	5.95	6.75		6.35	
benzo(k)Fluoranthene	*8*	*459.50*	*0.92*	*920.50*	*0.92*	*0.92*	8.698016	584.68	0.58	2.63			
benzo(a)pyrene		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*							3.4
dibenzo(a,h)anthracene	75.66	52.54	0.11	78.78	0.08	0.09	823.0175	55323.24	55.32	46.89		51.11	
benzo(ghi) perelene	97	358.80	0.72	730.90	0.73	0.72	133.9317	9002.89	9.00	5.65		7.33	
Indeno(1,23cd)pyrene	77.5	53.75	0.11	110.89	0.11	0.11	709.7395	47708.69	47.71	27.18		37.45	

File: A:\PAH0241.D
Operator: suhana
Date Acquired: 9/10/96 14:23:44
Method File Name: SUPAHS.M
Sample Name: baseline .11
Misc Info:
Bottle Number: 1



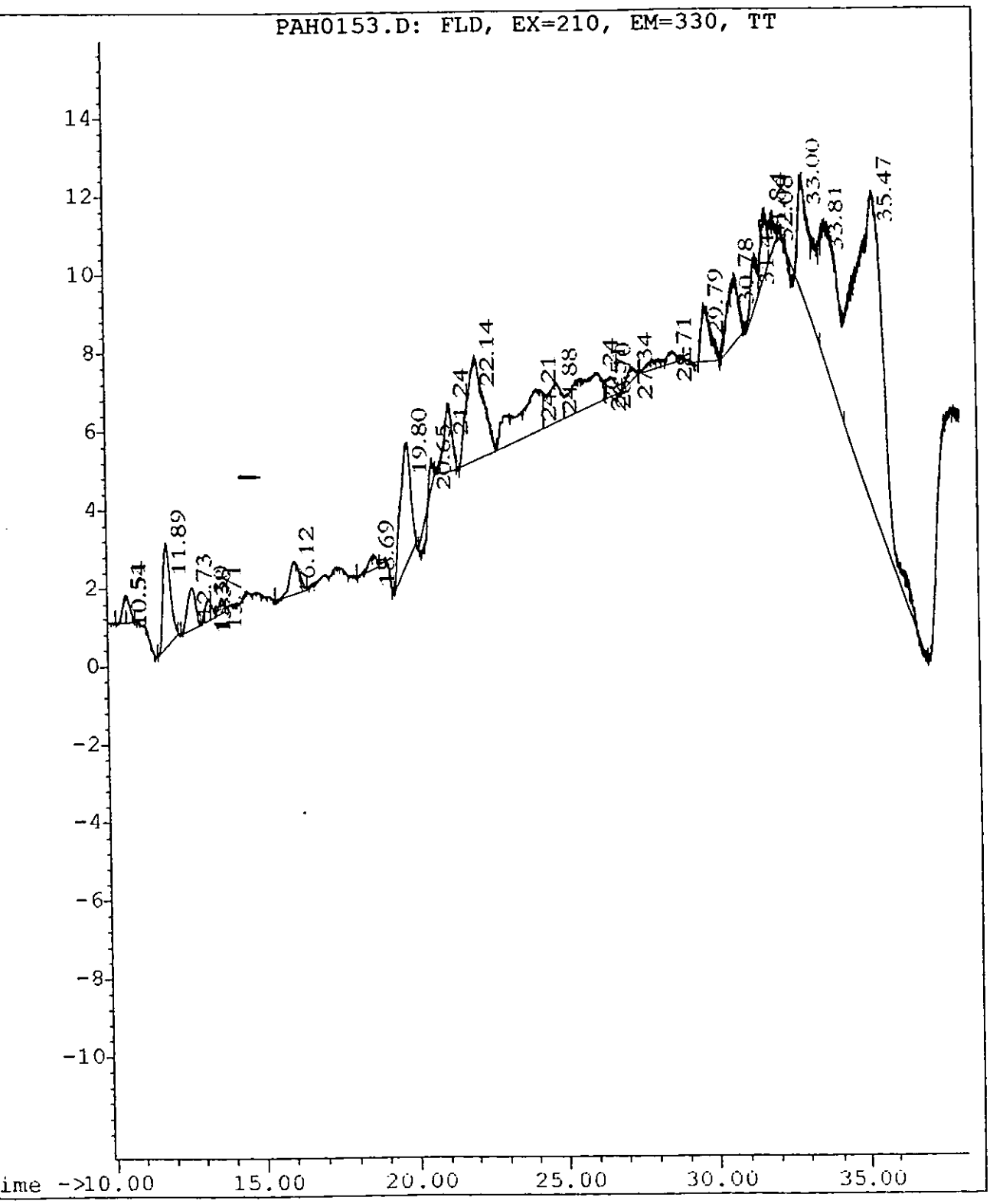
	BSTR Day 0 ML									
	Sample	BSTR d0 ML		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L	11.62		PAH =	2324					
	Subsampled	0.0502 in 10 mls								
	Concentration O&G in ACN	0.005								mg/L
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L	
3	acenapthene	1.52								
4	Fluorene	19.21	104.85	0.21	214.44	0.21	0.21	90.58	210.52	0.21
5	phenanthrene	84.04	106.37	0.21	190.85	0.19	0.20	416.46	967.86	0.97
6	anthracene	5.6	222.14	0.44	488.58	0.49	0.47	12.01	27.90	0.03
7	fluoranthrene	1.99	33.89	0.07	144.67	0.14	0.11	18.73	43.54	0.04
8	pyrene	21.99	81.74	0.16	169.80	0.17	0.17	131.96	306.68	0.31
9	benzo(a)anthracene	32.3	108	0.22	212	0.21	0.21	150.93	350.77	0.35
10	chrysene									
11	benzo(b)fluoranthene	0.8	84.84	0.17	173.90	0.17	0.17	4.66	10.82	0.01
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(e)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	11.89	52.54	0.11	78.78	0.08	0.09	129.34	300.58	0.30
15	benzo(ghi) perelene	0.9	358.80	0.72	730.90	0.73	0.72	1.24	2.89	0.0029
16	Indeno(1,23cd)pyrene	12	53.75	0.11	110.89	0.11	0.11	109.90	255.40	0.26

File: A:\PAH0146.D
Operator: suhana
Date Acquired: 20/9/96 14:06:48
Method File Name: SUPAHS.M
Sample Name: CSTR DAY 0
Misc Info:
Bottle Number: 1



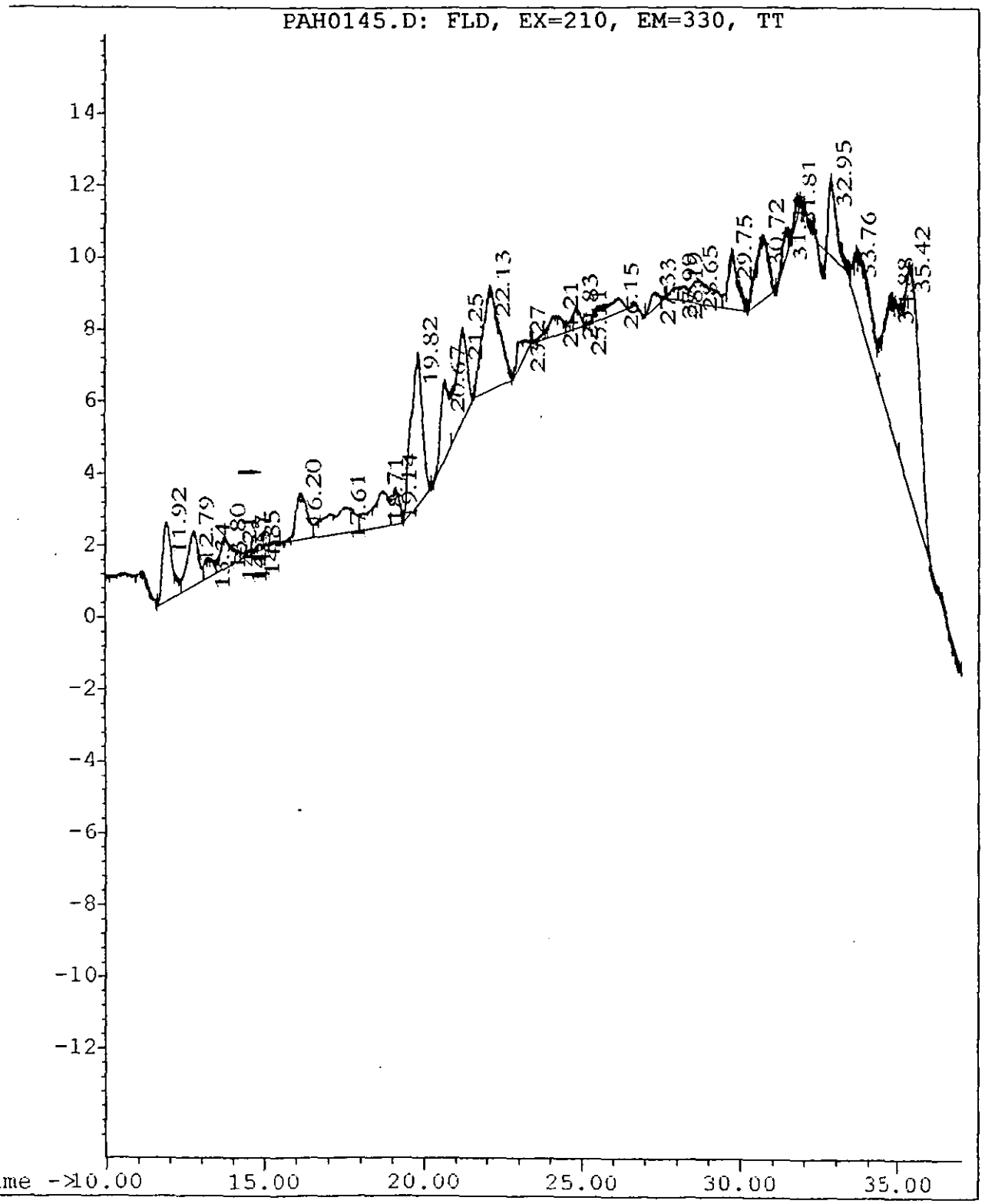
	BSTR Day 12 ML									
	Sample	BSTRd12ml		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L	24.98		PAH =	1752.9					
	Subsampled	0.0069/4								
	Concentration O&G in ACN		0.0017							
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L	
4	Fluorene	6.57	104.85	0.21	214.44	0.21	0.21	30.98	54.31	0.05
5	phenanthrene	47.13	106.37	0.21	190.85	0.19	0.20	233.55	409.42	0.41
6	anthracene	bdl	222.14	0.44	488.58	0.49	0.47			
7	fluoranthrene	bdl	33.89	0.07	144.67	0.14	0.11			
8	pyrene	18.77	81.74	0.16	169.80	0.17	0.17	112.64	197.45	0.20
9	benzo(a) anthracene	71.09	108	0.22	212	0.21	0.21	332.20	582.34	0.58
10	chrysene									
11	benzo(b)fluoranthene	bdl	84.84	0.17	173.90	0.17	0.17			
12	*benzo(k)Fluoranthene*	bdl	*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(a)pyrene*	bdl	*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracen	29.2	52.54	0.11	78.78	0.08	0.09	317.63	556.81	0.56
15	benzo(ghi) perelene	35.29	358.80	0.72	730.90	0.73	0.72	48.73	85.42	0.09
16	Indeno(1,23cd)pyrene	52.52	53.75	0.11	110.89	0.11	0.11	480.97	843.15	0.84

File: A:\PAH0153.D
Operator: suhana
Date Acquired: 23/9/96 12:41:15
Method File Name: SUPAHS.M
Sample Name: CSTR DAY 12
Misc Info:
Bottle Number: 1



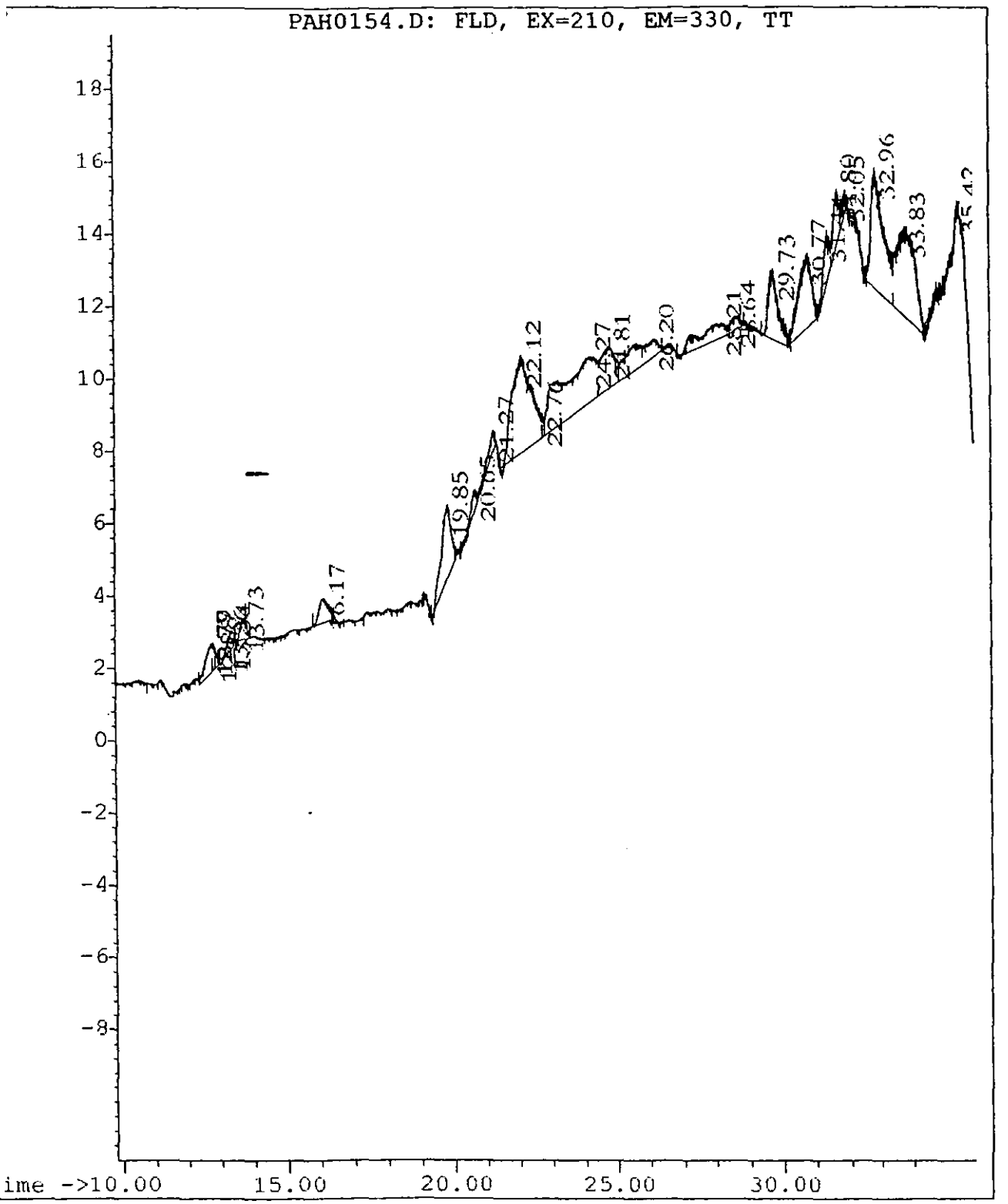
	BSTR Day 17 ML									
	Sample	BSTRd17ml		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L	23.79		PAH =	11895					
	Subsampled	0.0511/25								
	Concentration O&G in ACN	0.002								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L	
4	Fluorene		104.85	0.21	214.44	0.21	0.21			
5	phenanthrene	46.73	106.37	0.21	190.85	0.19	0.20	231.57	2754.54	2.75
6	anthracene	20.66	222.14	0.44	488.58	0.49	0.47	44.29	526.88	0.53
7	fluoranthrene		33.89	0.07	144.67	0.14	0.11			
8	pyrene	32.38	81.74	0.16	169.80	0.17	0.17	194.31	2311.33	2.31
9	benzo(a) anthracene	104.76	108	0.22	212	0.21	0.21	489.53	5822.99	5.82
10	chrysene									
11	benzo(b)fluoranthene	11.25	84.84	0.17	173.90	0.17	0.17	65.49	778.97	0.78
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	34.08	52.54	0.11	78.78	0.08	0.09	370.72	4409.68	4.41
15	benzo(ghi) perelene	35.29	358.80	0.72	730.90	0.73	0.72	48.73	579.60	0.58
16	Indeno(1,23cd)pyrene	31.35	53.75	0.11	110.89	0.11	0.11	287.10	3415.07	3.42

File: A:\PAH0145.D
Operator: suhana
Date Acquired: 20/9/96 12:37:19
Method File Name: SUPAHS.M
Sample Name: CSTR DAY 17
Misc Info:
Bottle Number: 1



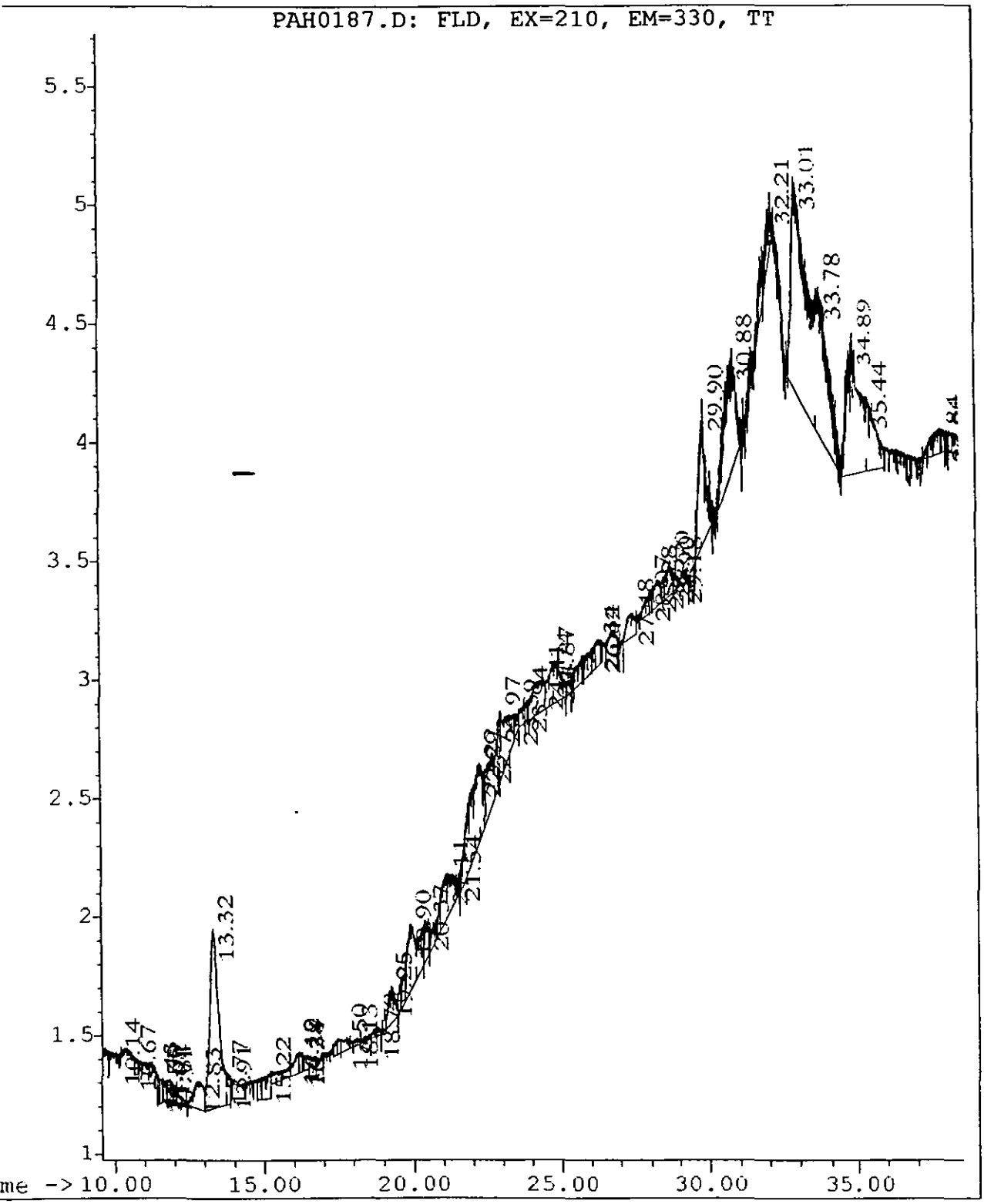
	BSTR Day 37 ML									
	Sample	BSTRd37ml		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L	2.97		PAH =	1237.5					
	Subsampled	0.0048/2								
	Concentration O&G in ACN	0.0024								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L	
4	Fluorene		104.85	0.21	214.44	0.21	0.21			
5	phenanthrene		106.37	0.21	190.85	0.19	0.20			
6	anthracene	6.81	222.14	0.44	488.58	0.49	0.47	14.60	18.07	0.02
7	fluoranthrene		33.89	0.07	144.67	0.14	0.11			
8	pyrene	13.45	81.74	0.16	169.80	0.17	0.17	80.71	99.88	0.10
9	benzo(a) anthracene	104.76	108	0.22	212	0.21	0.21	489.53	605.80	0.61
10	chrysene									
11	benzo(b)fluoranthene	11.25	84.84	0.17	173.90	0.17	0.17	65.49	81.04	0.08
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	37.09	52.54	0.11	78.78	0.08	0.09	403.46	499.28	0.50
15	benzo(ghi) perelene	106.46	358.80	0.72	730.90	0.73	0.72	146.99	181.90	0.18
16	Indeno(1,23cd)pyrene	60.19	53.75	0.11	110.89	0.11	0.11	551.22	682.13	0.68

File: A:\PAH0154.D
Operator: suhana
Date Acquired: 23/9/96 14:05:07
Method File Name: SUPAHS.M
Sample Name: CSTR DAY 37
Misc Info:
Bottle Number: 1



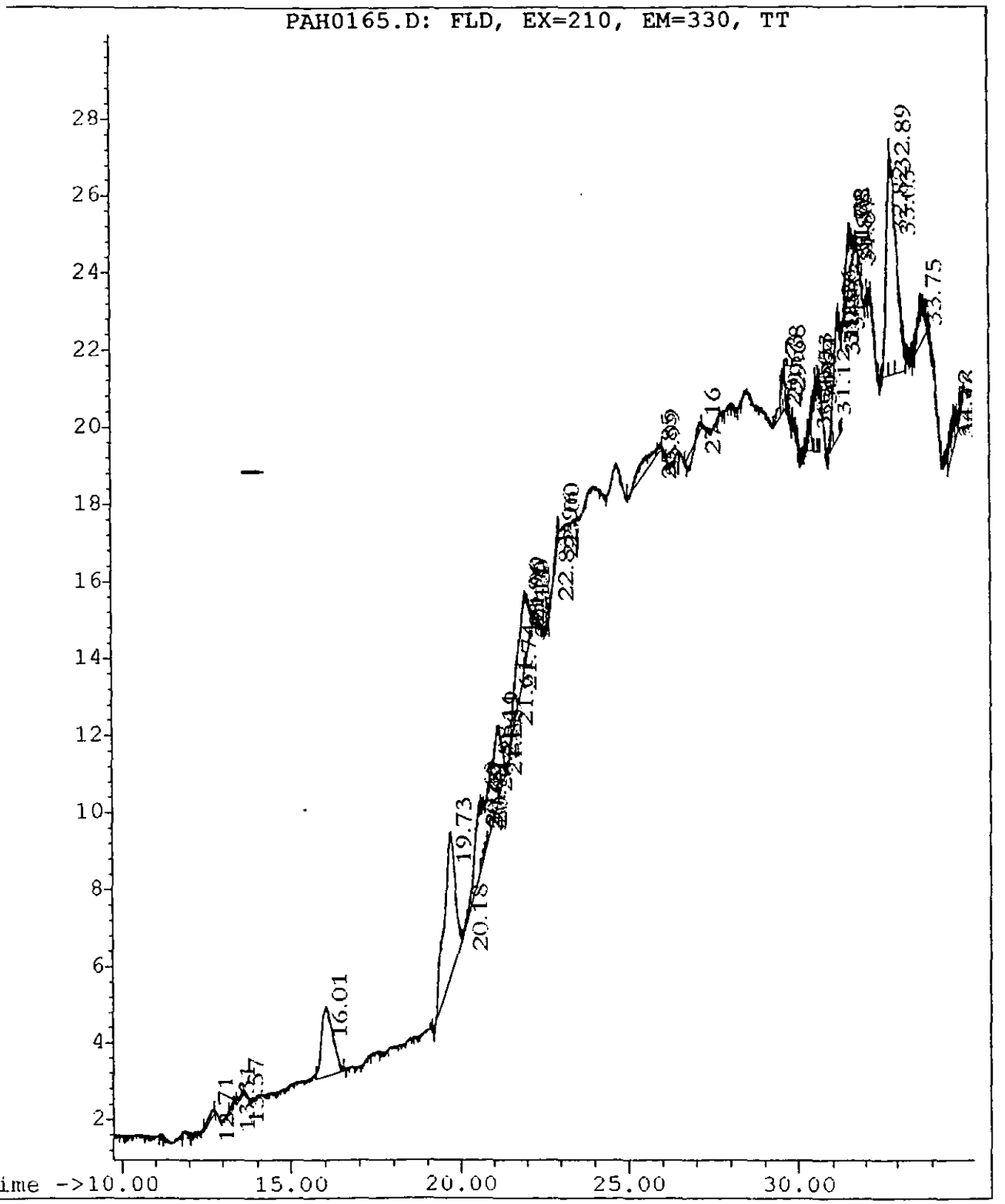
	BSTR day 58 ML									
	Sample	BSTRd58ml		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L	0.55		PAH =	207.5					
	Subsampled	0.0053/2								
	Concentration O&G in ACN	0.00265								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	**ug/L**	
4	Fluorene		104.85	0.21	214.44	0.21	0.21			
5	phenanthrene		106.37	0.21	190.85	0.19	0.20			
6	anthracene		222.14	0.44	488.58	0.49	0.47			
7	fluoranthrene		33.89	0.07	144.67	0.14	0.11			
8	pyrene	3.07	81.74	0.16	169.80	0.17	0.17	18.42	3.82	0.0038
9	benzo(a) anthracene	6.02	108	0.22	212	0.21	0.21	28.13	5.84	0.0058
10	chrysene									
11	benzo(b)fluoranthene	4.61	84.84	0.17	173.90	0.17	0.17	26.84	5.57	0.0056
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	10.1	52.54	0.11	78.78	0.08	0.09	109.87	22.80	0.0228
15	benzo(ghi) perelene	35.83	358.80	0.72	730.90	0.73	0.72	49.47	10.27	0.0103
16	Indeno(1,23cd)pyrene	32.8	53.75	0.11	110.89	0.11	0.11	300.38	62.33	0.0623

File: A:\PAH0187.D
Operator: suhana
Date Acquired: 30/9/96 14:31:29
Method File Name: SUPAHS.M
Sample Name: cstr day 58
Misc Info:
Bottle Number: 1



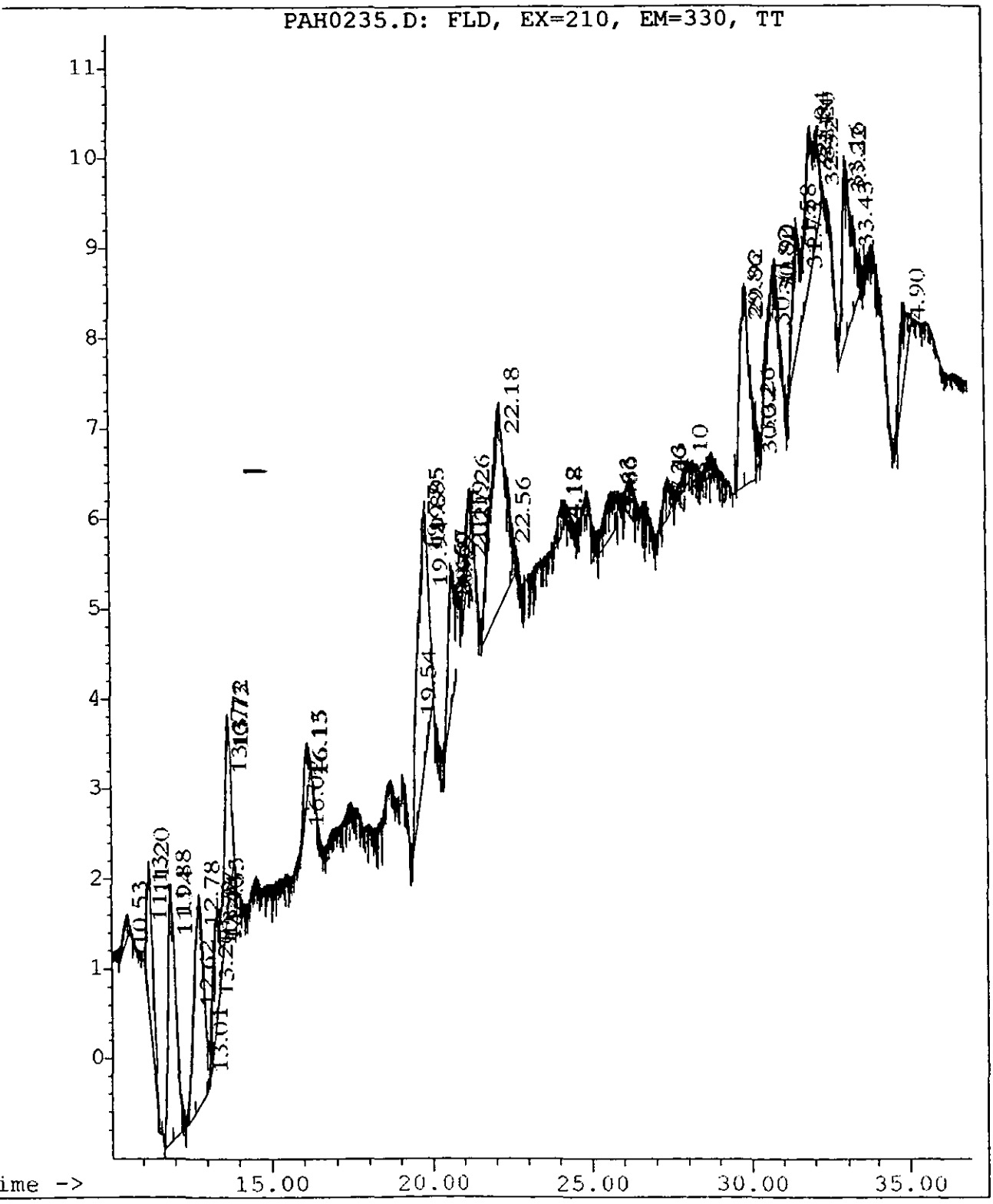
	BSTR Day 65 settled solids										
	Sample	BSTRd65bs		Multiplication factor to convert subsampled oil to ng/L							
	O&G/kg	194g/kg		PAH =	66896.5						
	Subsampled	0.0058/2									
	Concentration O&G in ACN	0.0029									
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm	UTS
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	**ug/L**		ppm
4	Fluorene		104.85	0.21	214.44	0.21	0.21				
5	phenanthrene	1.74	106.37	0.21	190.85	0.19	0.20	8.62	576.8226	0.58	5.60
6	anthracene	1.88	222.14	0.44	488.58	0.49	0.47	4.03	269.6341	0.27	3.4
7	fluoranthrene		33.89	0.07	144.67	0.14	0.11				
8	pyrene	41	81.74	0.16	169.80	0.17	0.17	246.04	16459.17	**16.46**	8.2
9	benzo(a) anthracene	87.39	108	0.22	212	0.21	0.21	408.36	27318.15	**27.32**	3.4
10	chrysene										4.8
11	benzo(b)fluoranthene	16	84.84	0.17	173.90	0.17	0.17	93.14	6230.537	6.23	
12	*benzo(k)Fluoranthene*	11.16	*459.50*	*0.92*	*920.50*	*0.92*	*0.92*	12.13	811.7042	0.81	
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*				3.4
14	dibenzo(a,h)anthracene	31.21	52.54	0.11	78.78	0.08	0.09	339.50	22711.19	22.71	3.4
15	benzo(ghi) perelene	45.28	358.80	0.72	730.90	0.73	0.72	62.52	4182.359	4.18	
16	Indeno(1,23cd)pyrene	60	53.75	0.11	110.89	0.11	0.11	549.48	36758	36.76	

File: A:\PAH0165.D
Operator: suhana
Date Acquired: 24/9/96 14:14:30
Method File Name: SUPAHS.M
Sample Name: cstr bs day 65
Misc Info:
Bottle Number: 1



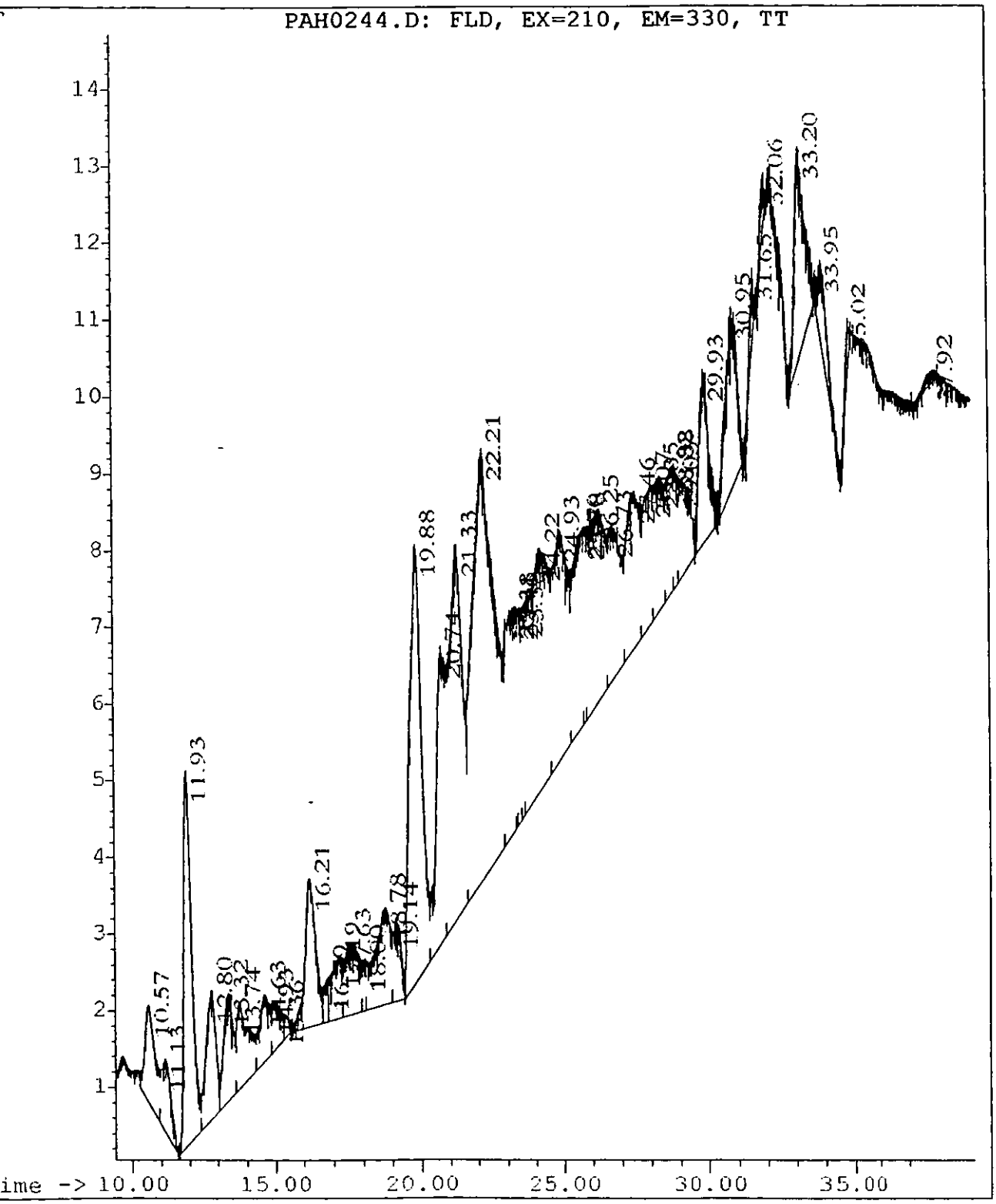
	Airlift Day 0 ML									
	Sample	alft d0 ml		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L	1.53		PAH =	566.66					
	Subsampled	0.0054g								
2mls	Concentration O&G in ACN	0.0027								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L	
4	Fluorene	11.01	104.85	0.21	214.44	0.21	0.21	51.92	29.42	0.02942
5	phenanthrene	47.11	106.37	0.21	190.85	0.19	0.20	233.45	132.29	0.132289
6	anthracene	26.26	222.14	0.44	488.58	0.49	0.47	56.30	31.90	0.031903
7	fluoranthrene	1.6	33.89	0.07	144.67	0.14	0.11	15.06	8.54	0.008535
8	pyrene	33.83	81.74	0.16	169.80	0.17	0.17	203.01	115.04	0.115039
9	benzo(a) anthracene	99.88	108	0.22	212	0.21	0.21	466.73	264.48	0.264477
10	chrysene									
11	benzo(b)fluoranthene	9.83	84.84	0.17	173.90	0.17	0.17	57.22	32.42	0.032425
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	50.24	52.54	0.11	78.78	0.08	0.09	546.50	309.68	0.309681
15	benzo(ghi) perelene	82.15	358.80	0.72	730.90	0.73	0.72	113.43	64.27	0.064275
16	Indeno(1,23cd)pyrene	41.15	53.75	0.11	110.89	0.11	0.11	376.85	213.55	0.213545

File: A:\PAH0235.D
Operator: suhana
Date Acquired: 8/10/96 18:26:42
Method File Name: SUPAHS.M
Sample Name: airlift day 0
Misc Info:
Bottle Number: 1



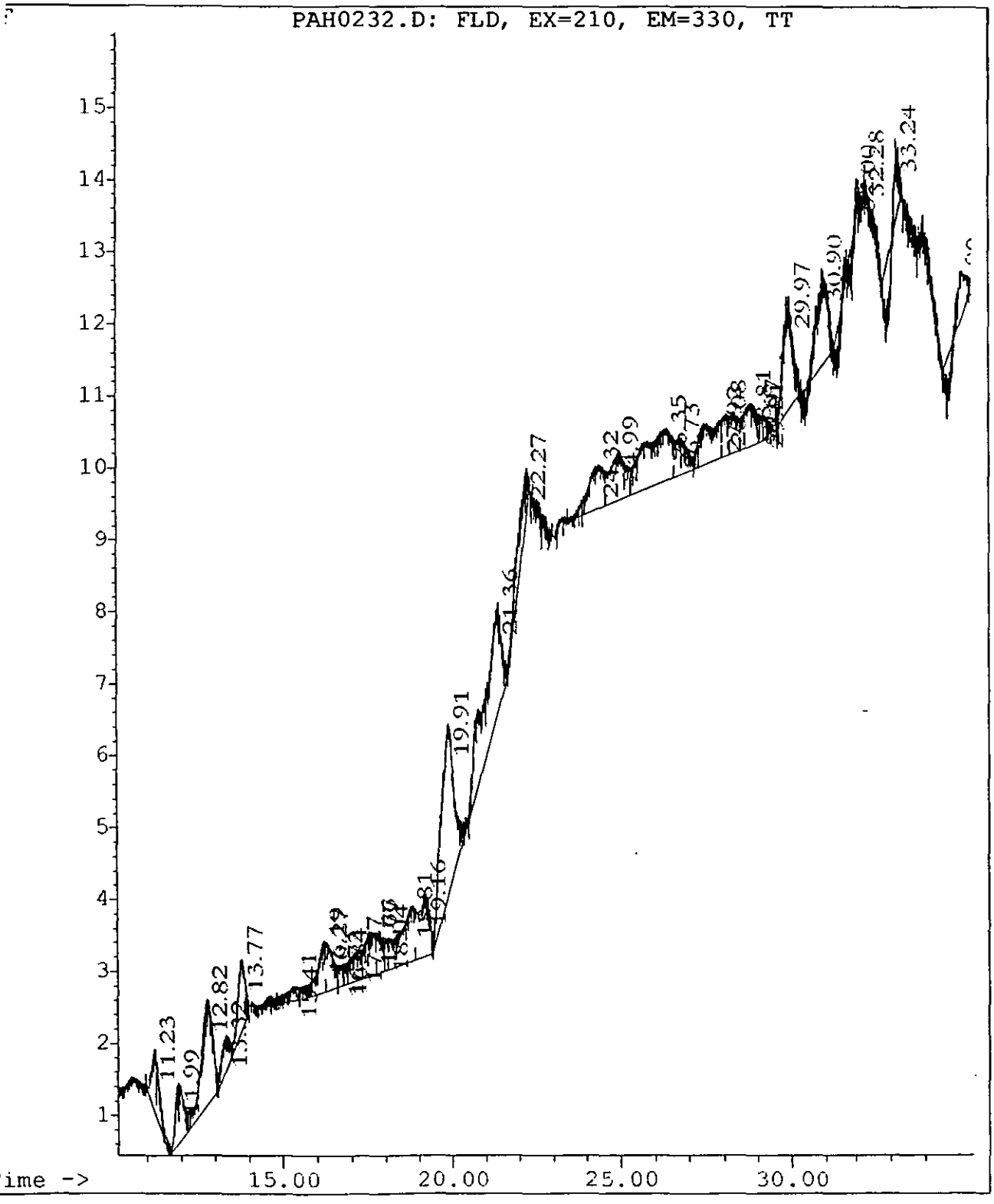
	Airlift second start ,sludge sample									
bs	Sample	alft 2nd st		Multiplication factor to convert subsampled oil to ng/L						
	O&G/kg	202 g		PAH =	66229.5					
	Subsampled	0.0061								
2ml	Concentration O&G in ACN	0.00305								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L	
4	Fluorene	15.85	104.85	0.21	214.44	0.21	0.21	74.74	4950.016	4.9500
5	phenanthrene	88.64	106.37	0.21	190.85	0.19	0.20	439.26	29091.82	29.0918
6	anthracene	12.12	222.14	0.44	488.58	0.49	0.47	25.98	1720.947	1.7209
7	fluoranthrene	bdl	33.89	0.07	144.67	0.14	0.11			bdl
8	pyrene	27.76	81.74	0.16	169.80	0.17	0.17	166.59	11032.95	11.0330
9	benzo(a) anthracene	136.8	108	0.22	212	0.21	0.21	639.25	42337.36	42.3374
10	chrysene									
11	benzo(b)fluoranthene	12.05	84.84	0.17	173.90	0.17	0.17	70.14	4645.587	4.6456
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(e)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	66.94	52.54	0.11	78.78	0.08	0.09	728.16	48225.85	48.2259
15	benzo(ghi) perelene	61.54	358.80	0.72	730.90	0.73	0.72	84.97	5627.564	5.6276
16	Indeno(1,23cd)pyrene	91.9	53.75	0.11	110.89	0.11	0.11	841.61	55739.65	55.7396

File: A:\PAH0244.D
Operator: suhana
Date Acquired: 9/10/96 18:33:05
Method File Name: SUPAHS.M
Sample Name: airlft 2nd start
Misc Info:
Bottle Number: 1



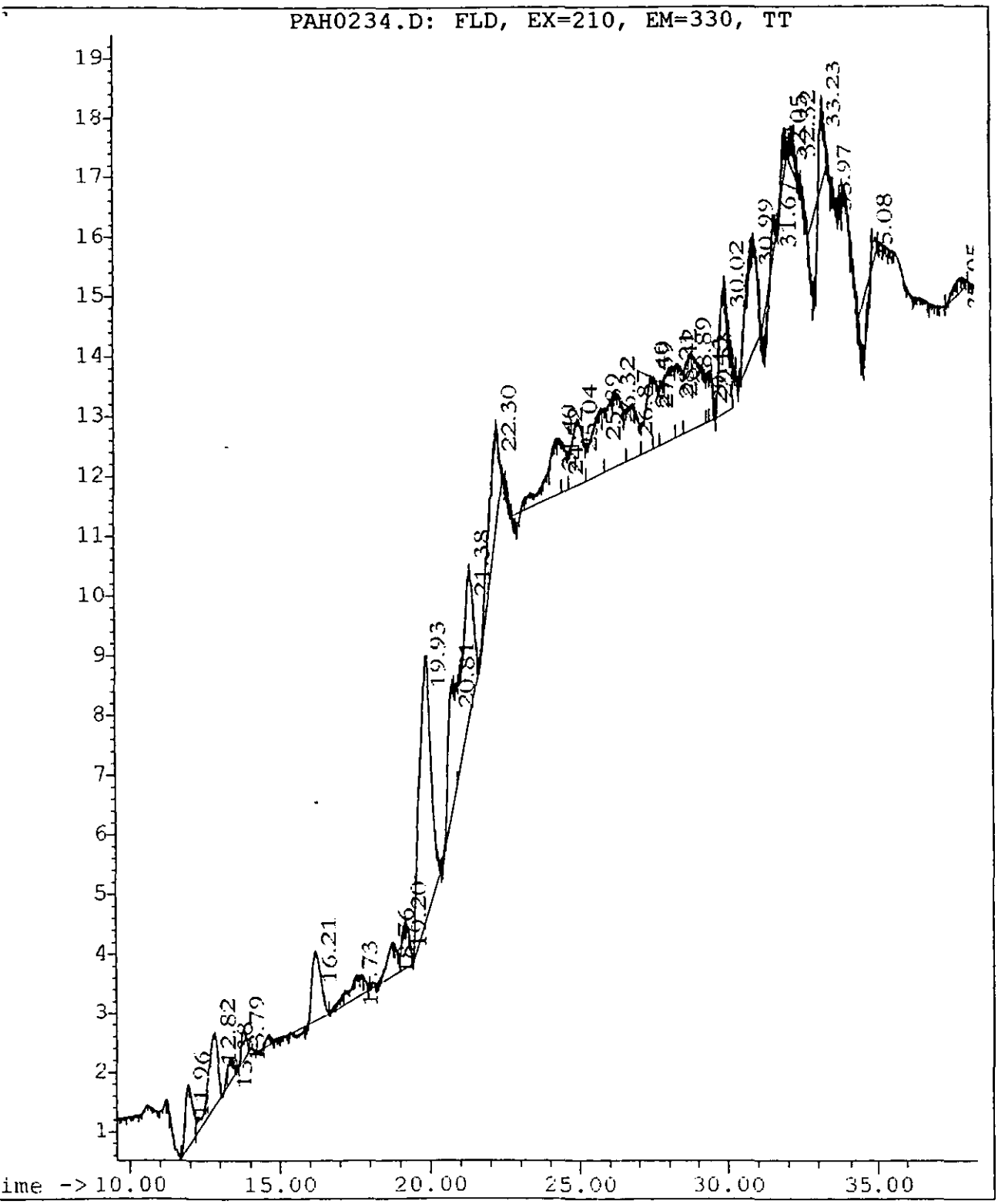
	Airlift Day 21 ML									
restart	Sample	alft d21 ml		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L (g/L)	3.83		PAH =	1532					
	Subsampled (g)	0.005								
2mls	Concentration O&G in ACN	0.0025g/ml								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L	
4	Fluorene	bdl	104.85	0.21	214.44	0.21	0.21			bdl
5	phenanthrene	11.76	106.37	0.21	190.85	0.19	0.20	58.28	89.28	0.08928
6	anthracene	13.32	222.14	0.44	488.58	0.49	0.47	28.56	43.75	0.04375
7	fluoranthrene	bdl	33.89	0.07	144.67	0.14	0.11			bdl
8	pyrene	11.48	81.74	0.16	169.80	0.17	0.17	68.89	105.54	0.105541
9	benzo(a) anthracene	64.98	108	0.22	212	0.21	0.21	303.64	465.18	0.465184
10	chrysene									
11	benzo(b)fluoranthene	4.65	84.84	0.17	173.90	0.17	0.17	27.07	41.47	0.041468
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	43.18	52.54	0.11	78.78	0.08	0.09	469.71	719.59	0.719588
15	benzo(ghi) perelene	65	358.80	0.72	730.90	0.73	0.72	89.75	137.49	0.137494
16	Indeno(1,23cd)pyrene	34.31	53.75	0.11	110.89	0.11	0.11	314.21	481.37	0.481367

File: A:\PAH0232.D
Operator: suhana
Date Acquired: 8/10/96 13:44:22
Method File Name: SUPAHS.M
Sample Name: airlift day 12
Misc Info:
Bottle Number: 1



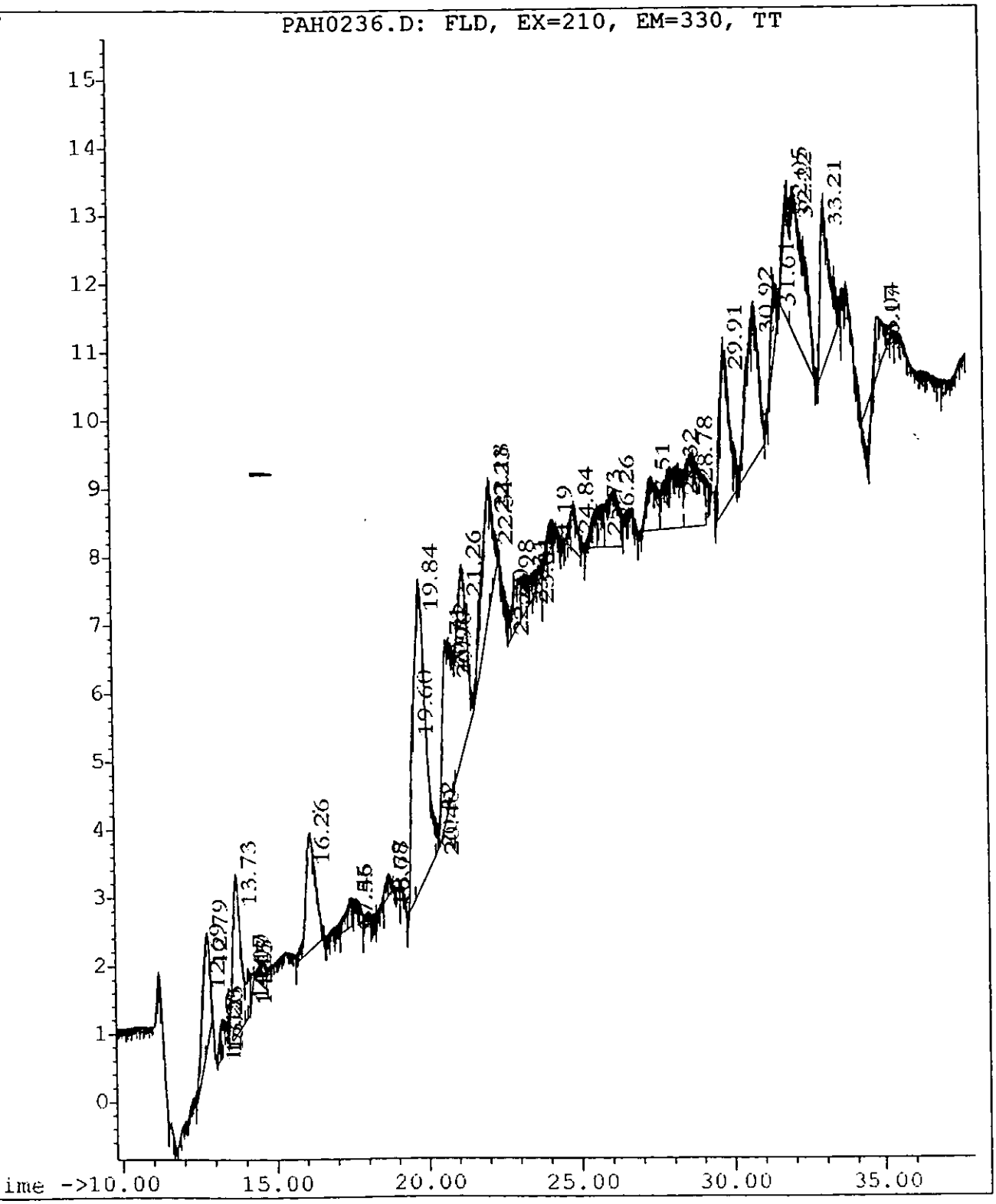
	Airlift Day 26 ML									
	Sample	alft day 26		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L (g/L)	11.27		PAH =	7761.76					
	Subsampled (g)	0.00489								
2.5mls	Concentration O&G in ACN	0.001956								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	**ug/L**	
4	Fluorene	bdl	104.85	0.21	214.44	0.21	0.21			bdl
5	phenanthrene	17.17	106.37	0.21	190.85	0.19	0.20	85.09	660.4198	0.66042
6	anthracene	5.65	222.14	0.44	488.58	0.49	0.47	12.11	94.02042	0.09402
7	fluoranthrene	bdl	33.89	0.07	144.67	0.14	0.11			bdl
8	pyrene	25.26	81.74	0.16	169.80	0.17	0.17	151.58	1176.561	1.176561
9	benzo(a) anthracene	82	108	0.22	212	0.21	0.21	383.18	2974.132	2.974132
10	chrysene									
11	benzo(b)fluoranthene	12.76	84.84	0.17	173.90	0.17	0.17	74.28	576.5182	0.576518
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	62.55	52.54	0.11	78.78	0.08	0.09	680.41	5281.171	5.281171
15	benzo(ghi) perelene	147	358.80	0.72	730.90	0.73	0.72	202.97	1575.393	1.575393
16	Indeno(1,23cd)pyrene	64.17	53.75	0.11	110.89	0.11	0.11	587.66	4561.309	4.561309

File: A:\PAH0234.D
Operator: suhana
Date Acquired: 8/10/96 15:58:30
Method File Name: SUPAHS.M
Sample Name: airlift day 26
Misc Info:
Bottle Number: 1



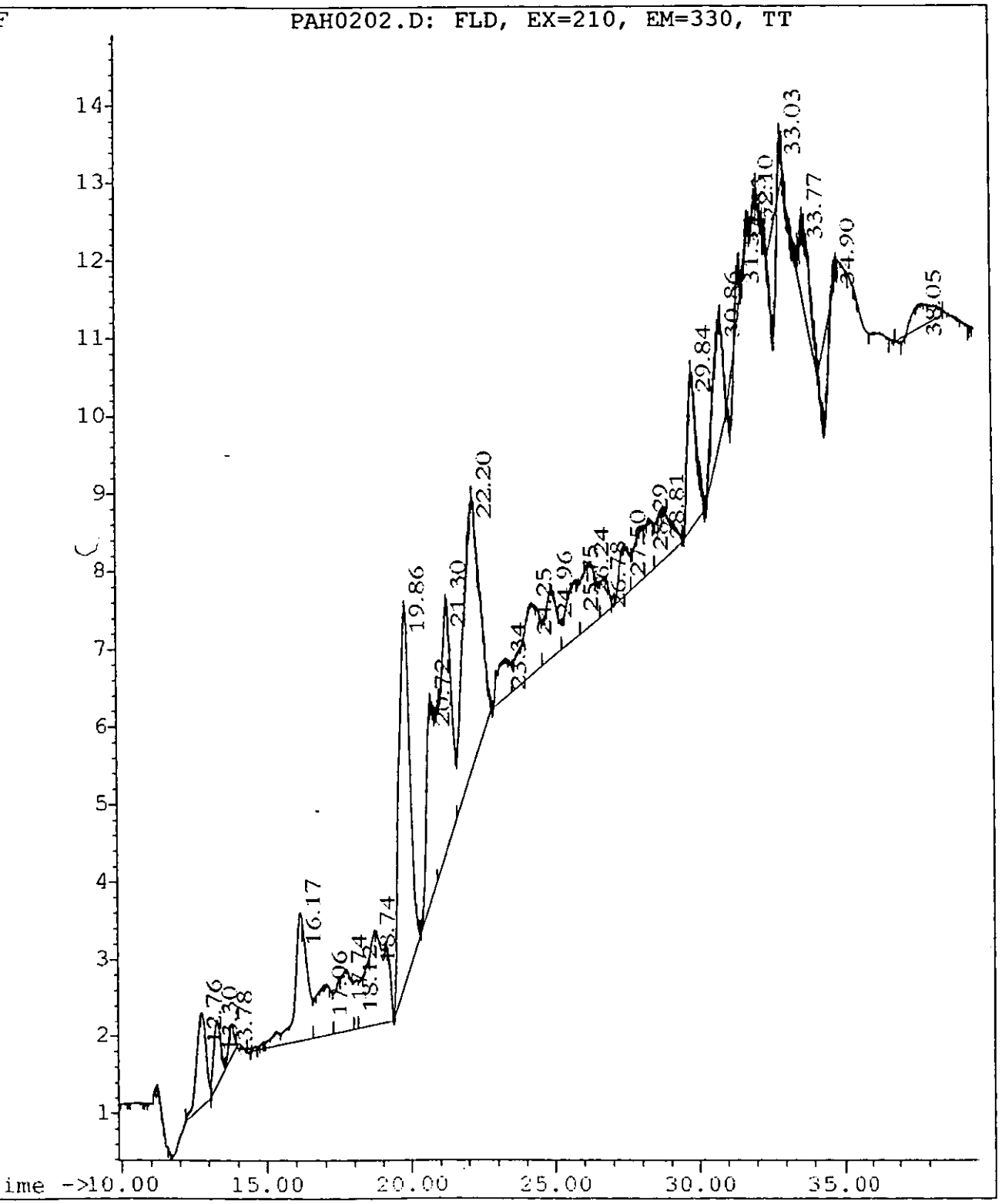
	Airlift Day 31 ML									
	Sample	alft d31 ml		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L (g/L)	2.16		PAH =	830.77					
	Subsampled (g)	0.0052								
2mls	Concentration O&G in ACN	0.0026								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L	
4	Fluorene	bdl	104.85	0.21	214.44	0.21	0.21			bdl
5	phenanthrene	bdl	106.37	0.21	190.85	0.19	0.20			bdl
6	anthracene	41.33	222.14	0.44	488.58	0.49	0.47	88.61	73.61	0.0736
7	fluoranthrene	bdl	33.89	0.07	144.67	0.14	0.11			bdl
8	pyrene	37.75	81.74	0.16	169.80	0.17	0.17	226.54	188.20	0.1882
9	benzo(a) anthracene	105	108	0.22	212	0.21	0.21	490.65	407.62	0.4076
10	chrysene									
11	benzo(b)fluoranthene	9.93	84.84	0.17	173.90	0.17	0.17	57.80	48.02	0.0480
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	69.38	52.54	0.11	78.78	0.08	0.09	754.70	626.99	0.6270
15	benzo(ghi) perelene	83	358.80	0.72	730.90	0.73	0.72	114.60	95.21	0.0952
16	Indeno(1,23cd)pyrene	54.36	53.75	0.11	110.89	0.11	0.11	497.82	413.58	0.4136

File: A:\PAH0236.D
Operator: suhana
Date Acquired: 8/10/96 19:34:35
Method File Name: SUPAHS.M
Sample Name: airlift day 31
Misc Info:
Bottle Number: 1



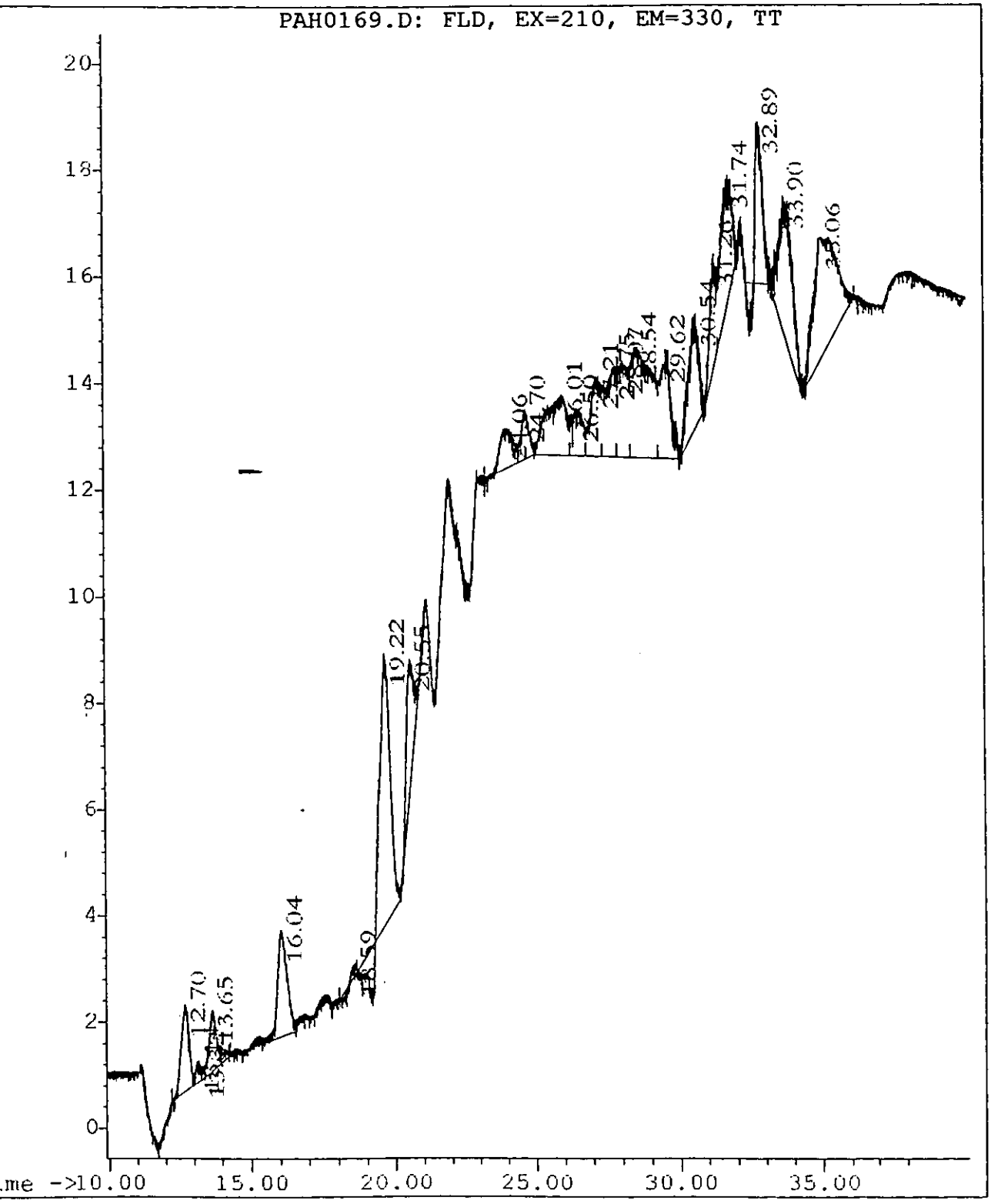
	Airlift Day 43 ML									
	Sample	alft d43 ml		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L (g/L)	13.74		PAH =	5608.16					
	Subsampled (g)	0.0049								
2mls	Concentration O&G in ACN	0.00245								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L	
4	Fluorene	bdl	104.85	0.21	214.44	0.21	0.21			bdl
5	phenanthrene		106.37	0.21	190.85	0.19	0.20			bdl
6	anthracene	5.96	222.14	0.44	488.58	0.49	0.47	12.78	71.66	0.0717
7	fluoranthrene		33.89	0.07	144.67	0.14	0.11			bdl
8	pyrene	26.21	81.74	0.16	169.80	0.17	0.17	157.29	882.08	0.8821
9	benzo(a) anthracene	131	108	0.22	212	0.21	0.21	612.15	3433.03	3.4330
10	chrysene									
11	benzo(b)fluoranthene	8.86	84.84	0.17	173.90	0.17	0.17	51.57	289.24	0.2892
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(e)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	20.06	52.54	0.11	78.78	0.08	0.09	218.21	1223.75	1.2238
15	benzo(ghi) perelene	113	358.80	0.72	730.90	0.73	0.72	156.02	875.00	0.8750
16	Indeno(1,23cd)pyrene	45.05	53.75	0.11	110.89	0.11	0.11	412.56	2313.73	2.3137

File: A:\PAH0202.D
Operator: suhana
Date Acquired: 2/10/96 16:37:44
Method File Name: SUPAHS.M
Sample Name: alift d43 ml #3
Misc Info:
Bottle Number: 1



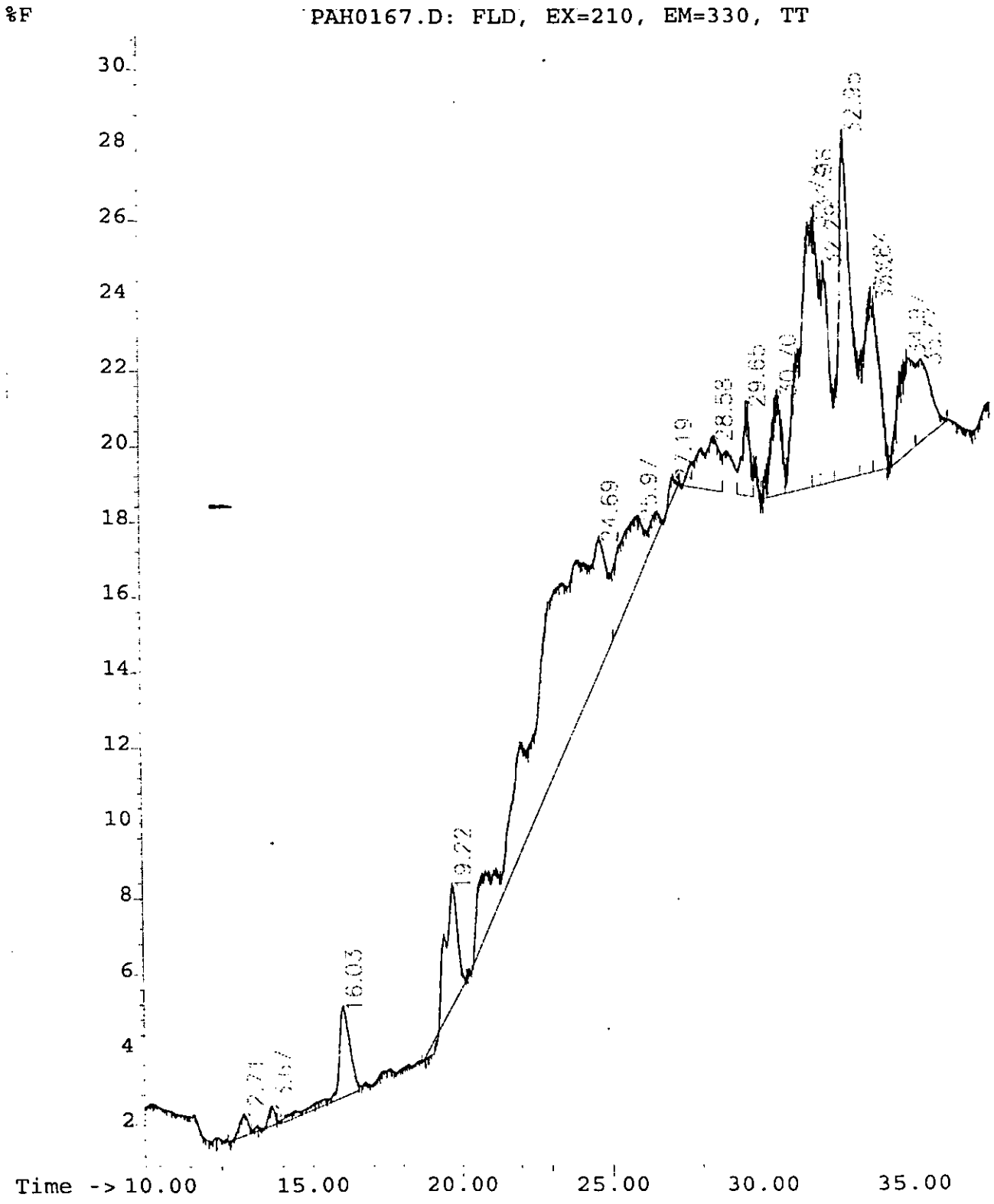
	Airlift Day 48 ML									
	Sample	alft d48 ml		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L	10.38		PAH =	4070.59					
	Subsampled	0.0051								
2 mls	Concentration O&G in ACN	0.00255								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L	
4	Fluorene	bdl	104.85	0.21	214.44	0.21	0.21			bdl
5	phenanthrene	bdl	106.37	0.21	190.85	0.19	0.20			bdl
6	anthracene	22.9	222.14	0.44	488.58	0.49	0.47	49.10	199.851	0.199851
7	fluoranthrene	bdl	33.89	0.07	144.67	0.14	0.11			bdl
8	pyrene	48.8	81.74	0.16	169.80	0.17	0.17	292.85	1192.059	1.192059
9	benzo(a) anthracene	109	108	0.22	212	0.21	0.21	509.35	2073.338	2.073338
10	chrysene									
11	benzo(b)fluoranthene	17.05	84.84	0.17	173.90	0.17	0.17	99.25	404.0023	0.404002
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	50.74	52.54	0.11	78.78	0.08	0.09	551.94	2246.728	2.246728
15	benzo(ghi) perelene	96	358.80	0.72	730.90	0.73	0.72	132.55	539.5604	0.53956
16	Indeno(1,23cd)pyrene	42.47	53.75	0.11	110.89	0.11	0.11	388.94	1583.204	1.583204

File: A:\PAH0169.D
Operator: suhana
Date Acquired: 24/9/96 19:07:56
Method File Name: SUPAHS.M
Sample Name: D48 airlift
Misc Info:
Bottle Number: 1



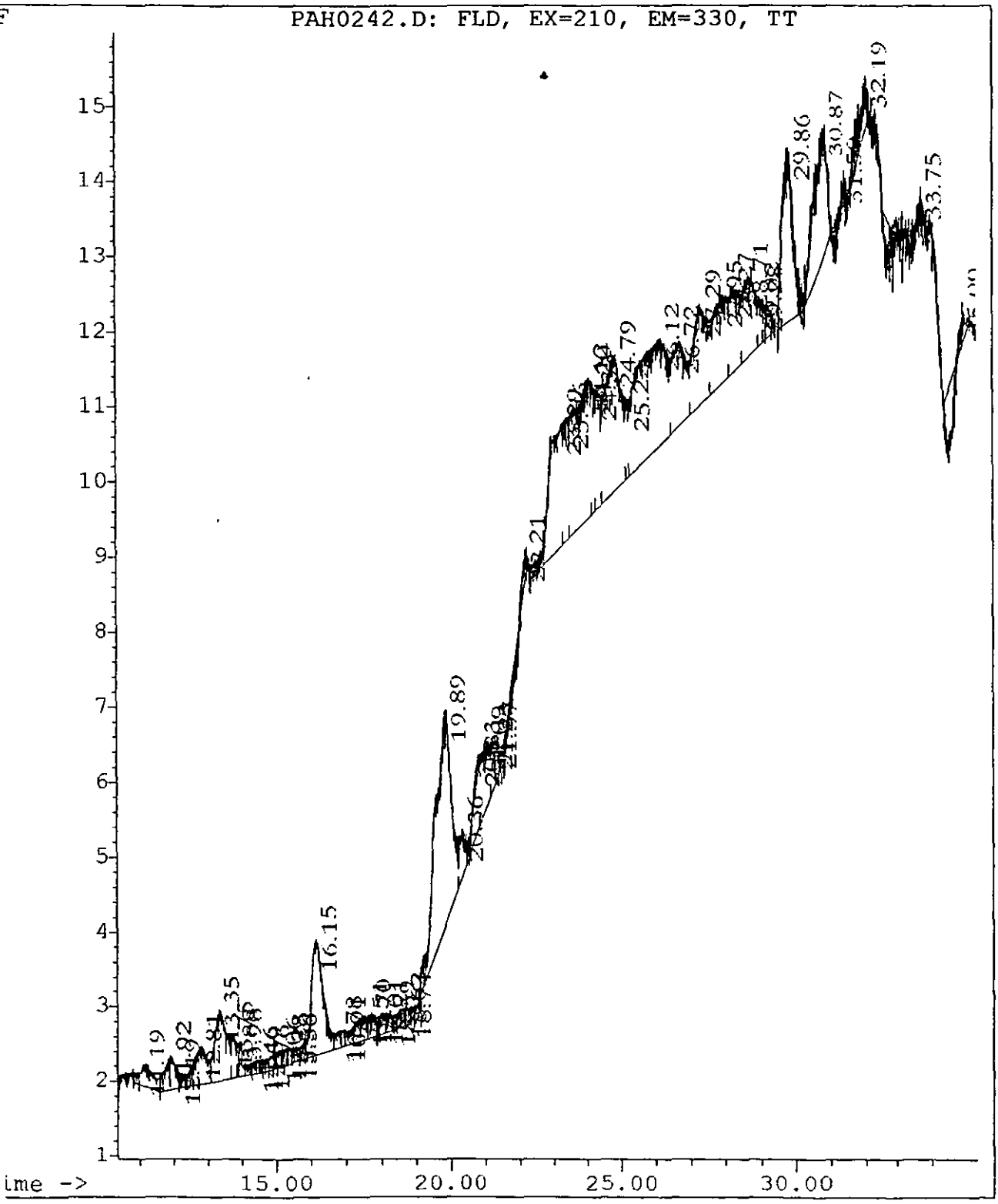
	Airlift Day 68 ML									
	Sample	alft d68 ml		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L	2.24		PAH =	896					
	Subsampled	0.005								
	Concentration O&G in ACN	0.0025								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	**ug/L**	
4	Fluorene	bdl	104.85	0.21	214.44	0.21	0.21			bdl
5	phenanthrene	bdl	106.37	0.21	190.85	0.19	0.20			bdl
6	anthracene	8.26	222.14	0.44	488.58	0.49	0.47	17.71	15.87	0.0159
7	fluoranthrene	bdl	33.89	0.07	144.67	0.14	0.11			bdl
8	pyrene	69.97	81.74	0.16	169.80	0.17	0.17	419.89	376.22	0.3762
9	benzo(a) anthracene	85.28	108	0.22	212	0.21	0.21	398.50	357.06	0.3571
10	chrysene									
11	benzo(b)fluoranthene	15.88	84.84	0.17	173.90	0.17	0.17	92.44	82.82	0.0828
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	58.37	52.54	0.11	78.78	0.08	0.09	634.94	568.91	0.5689
15	benzo(ghi) perelene	162	358.80	0.72	730.90	0.73	0.72	223.68	200.42	0.2004
16	Indeno(1,23cd)pyrene	120	53.75	0.11	110.89	0.11	0.11	1098.95	984.66	0.9847

File: A:\PAH0167.D
Operator: suhana
Date Acquired: 24/9/96 16:47:19
Method File Name: SUPAHS.M
Sample Name: D68 airlift
Misc Info:
Bottle Number: 1



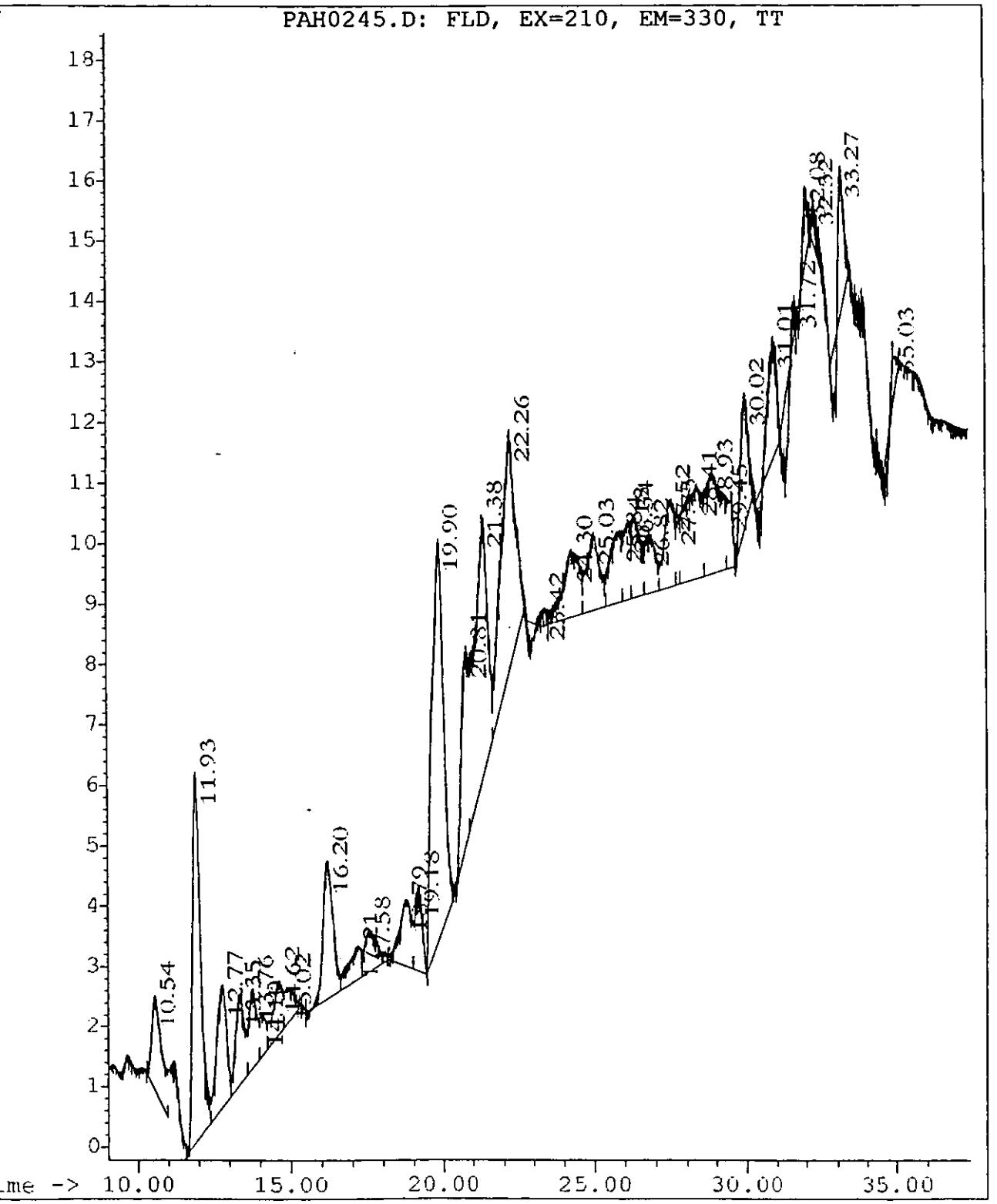
	Airlift Day 68 Final Settled Solids											
	Sample	alftbsd68		Multiplication factor to convert subsampled oil to ng/L								
	O&G/kg	105g/kg		PAH =	37500							
	Subsampled	0.0056										
2ml	Concentration O&G in ACN	0.0028										
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm	UTS	BDAT
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L		ppm	
4	Fluorene	bdl	104.85	0.21	214.44	0.21	0.21			bdl		
5	phenanthrene	5.34	106.37	0.21	190.85	0.19	0.20	26.46	992.3437	0.9923	5.60	34
6	anthracene	6.94	222.14	0.44	488.58	0.49	0.47	14.88	557.9615	0.5580	3.4	28
7	fluoranthrene	bdl	33.89	0.07	144.67	0.14	0.11			bdl		
8	pyrene	36	81.74	0.16	169.80	0.17	0.17	216.03	8101.296	8.1013	8.2	36
9	benzo(a) anthracene	57.14	108	0.22	212	0.21	0.21	267.01	10012.85	10.0129	8.2	35
10	chrysene											
11	benzo(b)fluoranthene	19.9	84.84	0.17	173.90	0.17	0.17	115.84	4343.966	4.3440		
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*					
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*				3.4	12
14	dibenzo(a,h)anthracene	45.64	52.54	0.11	78.78	0.08	0.09	496.46	18617.43	18.6174		
15	benzo(ghi) perelene	75.78	358.80	0.72	730.90	0.73	0.72	104.63	3923.714	3.9237		
16	Indeno(1,23cd)pyrene	63.17	53.75	0.11	110.89	0.11	0.11	578.51	21693.99	21.6940		

File: A:\PAH0242.D
Operator: suhana
Date Acquired: 9/10/96 15:57:02
Method File Name: SUPAHS.M
Sample Name: bottom solids AL
Misc Info:
Bottle Number: 1



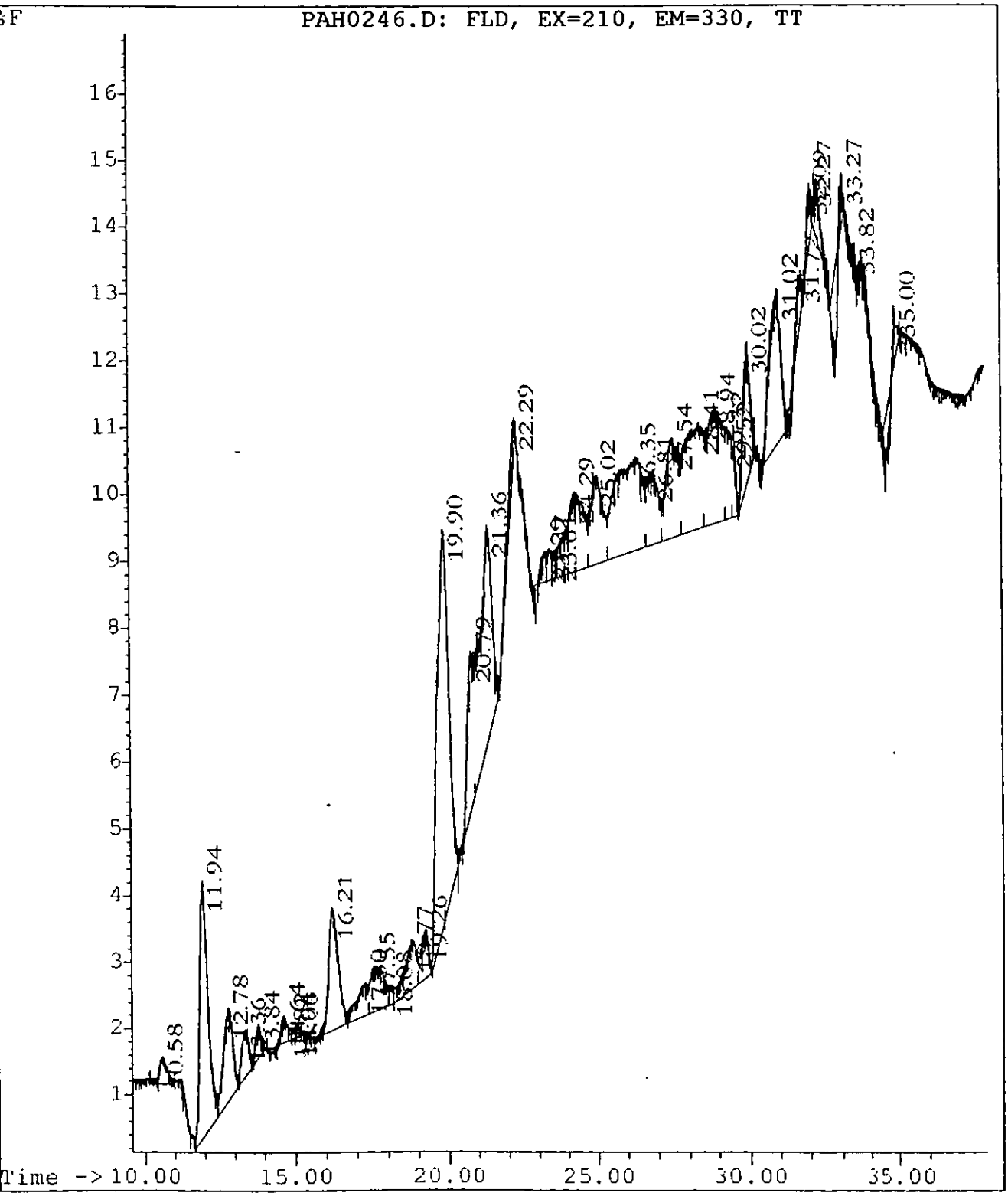
	Inipol Day 0 ML									
	Sample	Ini d0 ml		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L	6.9933		PAH =	2497.6					
	Subsampled	0.0055								
	Concentration O&G in ACN	0.0028								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L	
3	acenapthene	0.37	9.278	0.0186	18.2904	0.0183	0.0185	20	49.952	0.0500
4	Fluorene	34.1	104.85	0.21	214.44	0.21	0.21	160.80	401.6087	0.4016
5	phenanthrene	44.26	106.37	0.21	190.85	0.19	0.20	219.33	547.8024	0.5478
6	anthracene	8.76	222.14	0.44	488.58	0.49	0.47	18.78	46.90731	0.0469
7	fluoranthrene	0.87	33.89	0.07	144.67	0.14	0.11	8.19	20.45575	0.0205
8	pyrene	47.11	81.74	0.16	169.80	0.17	0.17	282.71	706.0846	0.7061
9	benzo(a) anthracene	57.95	108	0.22	212	0.21	0.21	270.79	676.3361	0.6763
[redacted]	chrysene	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
11	benzo(b)fluoranthene	18.61	84.84	0.17	173.90	0.17	0.17	108.33	270.5649	0.2706
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	57.91	52.54	0.11	78.78	0.08	0.09	629.94	1573.328	1.5733
15	benzo(ghi) perelene	199	358.80	0.72	730.90	0.73	0.72	274.77	686.2581	0.6863
16	Indeno(1,23cd)pyrene	108.23	53.75	0.11	110.89	0.11	0.11	991.16	2475.528	2.4755

File: A:\PAH0245.D
Operator: suhana
Date Acquired: 9/10/96 19:52:54
Method File Name: SUPAHS.M
Sample Name: icstr2 day 0
Misc Info:
Bottle Number: 1



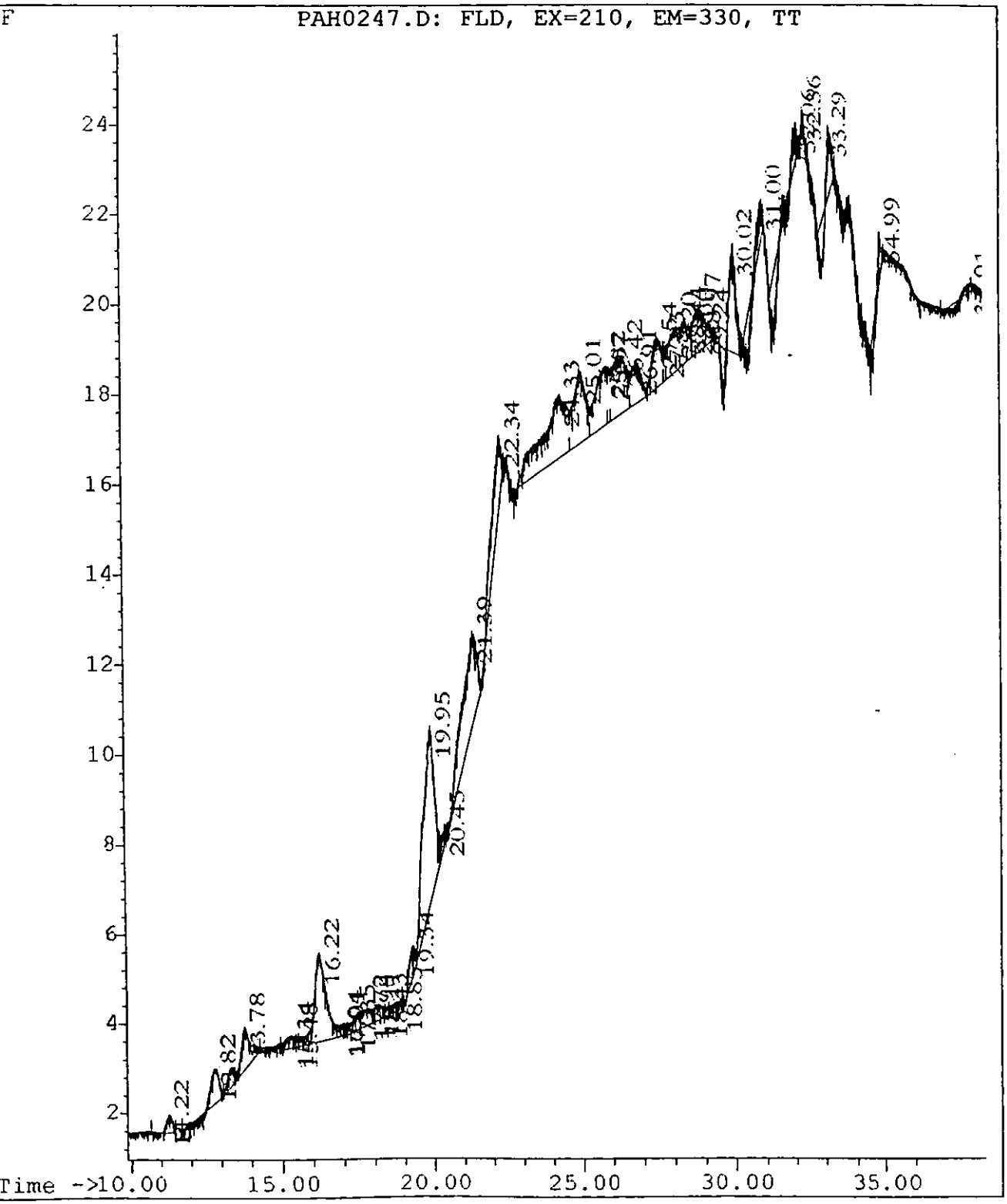
	Inipol Day 4 ML									
	Sample	Ini d4 ML		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L	19.13		PAH =	7357.692					
	Subsampled	0.0051								
	Concentration O&G in ACN	0.0026								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L	
4	Fluorene	8.36	104.85	0.21	214.44	0.21	0.21	39.42	290.05	0.2901
5	phenanthrene	66.2	106.37	0.21	190.85	0.19	0.20	328.06	2413.73	2.4137
6	anthracene	17.62	222.14	0.44	488.58	0.49	0.47	37.78	277.95	0.2779
7	fluoranthrene	15	33.89	0.07	144.67	0.14	0.11	141.21	1038.98	1.0390
8	pyrene	34.66	81.74	0.16	169.80	0.17	0.17	207.99	1530.35	1.5304
9	benzo(a) anthracene	160.5	108	0.22	212	0.21	0.21	750.00	5518.27	5.5183
10	chrysene	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
11	benzo(b)fluoranthene	13.37	84.84	0.17	173.90	0.17	0.17	77.83	572.63	0.5726
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	45.06	52.54	0.11	78.78	0.08	0.09	490.16	3606.41	3.6064
15	benzo(ghi) perelene	179.05	358.80	0.72	730.90	0.73	0.72	247.22	1818.98	1.8190
16	Indeno(1,23cd)pyrene	43.48	53.75	0.11	110.89	0.11	0.11	398.19	2929.74	2.9297

File: A:\PAH0246.D
Operator: suhana
Date Acquired: 9/10/96 20:54:45
Method File Name: SUPAHS.M
Sample Name: icstr2 day 4
Misc Info:
Bottle Number: 1



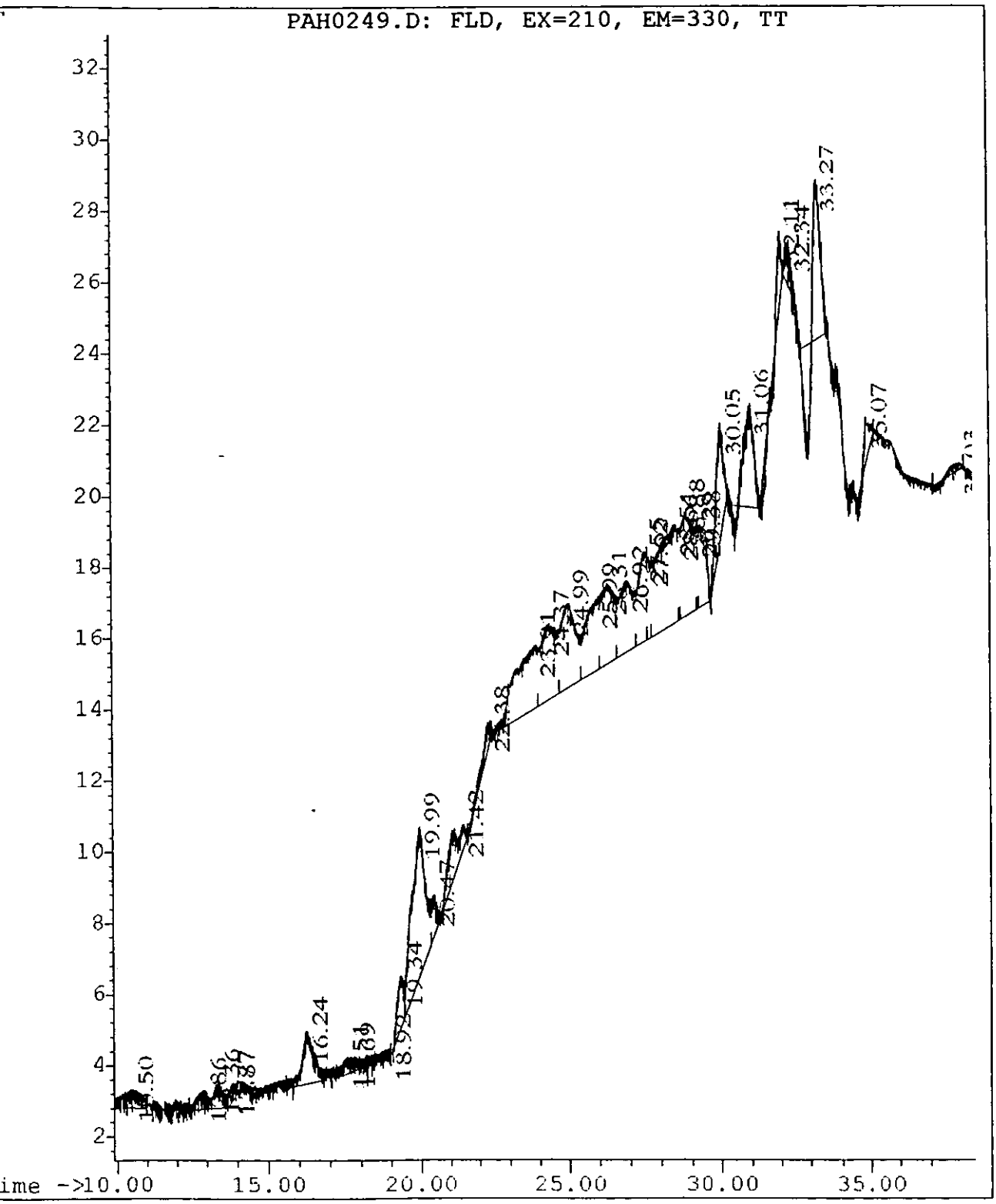
	Inipol Day 25 ML									
	Sample	Ini d25 ML		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L	7.43		PAH =	3032.653					
	Subsampled	0.0049								
	Concentration O&G in ACN	0.00245								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L	
4	Fluorene	nd	104.85	0.21	214.44	0.21	0.21			
5	phenanthrene	nd	106.37	0.21	190.85	0.19	0.20			
6	anthracene	7.07	222.14	0.44	488.58	0.49	0.47	15.16	45.97	0.0460
7	fluoranthrene	nd	33.89	0.07	144.67	0.14	0.11			
8	pyrene	38.63	81.74	0.16	169.80	0.17	0.17	231.82	703.02	0.7030
9	benzo(a) anthracene	105.48	108	0.22	212	0.21	0.21	492.90	1494.79	1.4948
10	chrysene									
11	benzo(b)fluoranthene	13.44	84.84	0.17	173.90	0.17	0.17	78.24	237.26	0.2373
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	87.86	52.54	0.11	78.78	0.08	0.09	955.73	2898.39	2.8984
15	benzo(ghi) perelene	193	358.80	0.72	730.90	0.73	0.72	266.48	808.15	0.8081
16	Indeno(1,23cd)pyrene	115.14	53.75	0.11	110.89	0.11	0.11	1054.44	3197.76	3.1978

File: A:\PAH0247.D
Operator: suhana
Date Acquired: 9/10/96 22:26:37
Method File Name: SUPAHS.M
Sample Name: icstr2 day 25
Misc Info:
Bottle Number: 1



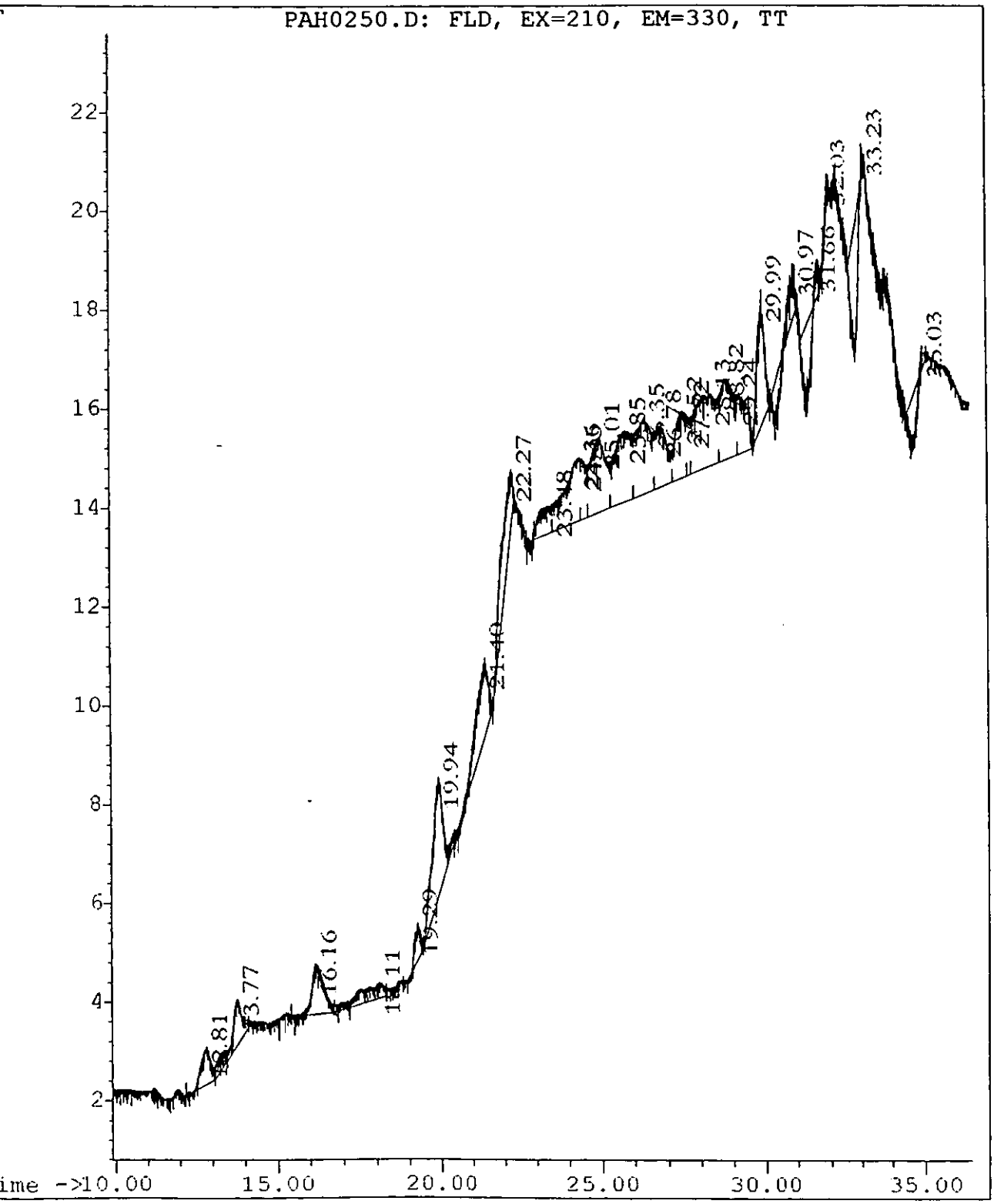
	Inipol Day 32 ML									
	Sample	Ini d32 ML		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L	5.7		PAH =	2280					
	Subsampled	0.005								
	Concentration O&G in ACN	0.0025								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	**ug/L**	
4	Fluorene	6.04	104.85	0.21	214.44	0.21	0.21	28.48	64.94	0.0649
5	phenanthrene	nd	106.37	0.21	190.85	0.19	0.20			
6	anthracene	16.44	222.14	0.44	488.58	0.49	0.47	35.25	80.36	0.0804
7	fluoranthrene	nd	33.89	0.07	144.67	0.14	0.11			
8	pyrene	29.75	81.74	0.16	169.80	0.17	0.17	178.53	407.05	0.4070
9	benzo(a) anthracene	153.6	108	0.22	212	0.21	0.21	717.76	1636.49	1.6365
10	chrysene									
11	benzo(b)fluoranthene	19.52	84.84	0.17	173.90	0.17	0.17	113.63	259.07	0.2591
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	126.9	52.54	0.11	78.78	0.08	0.09	1380.40	3147.31	3.1473
15	benzo(ghi) perelene	185.66	358.80	0.72	730.90	0.73	0.72	256.35	584.47	0.5845
16	Indeno(1,23cd)pyrene	110	53.75	0.11	110.89	0.11	0.11	1007.37	2296.81	2.2968

File: A:\PAH0249.D
Operator: suhana
Date Acquired: 10/10/96 11:37:20
Method File Name: SUPAHS.M
Sample Name: icstr2 day 32
Misc Info:
Bottle Number: 1



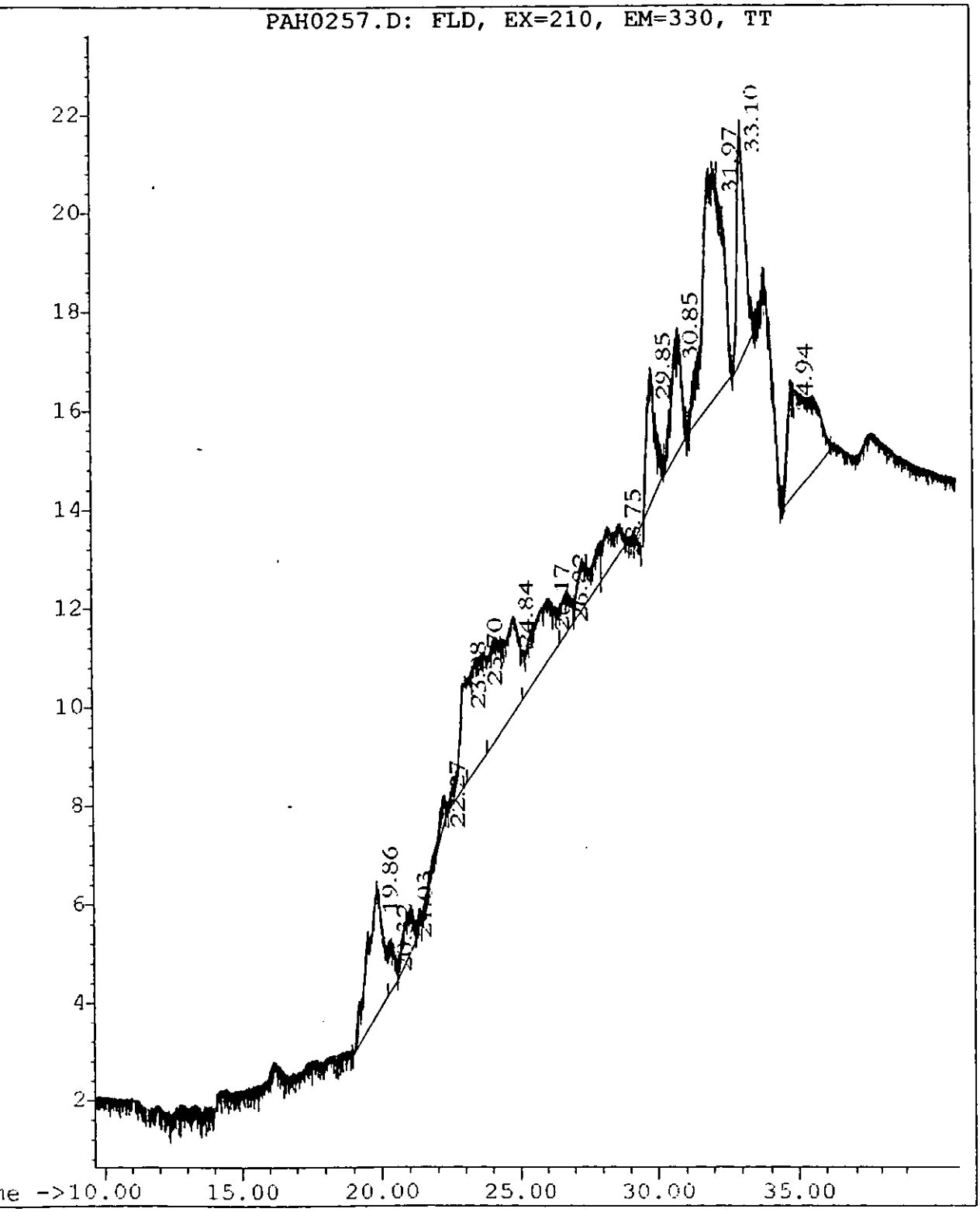
	Inipol Day 48 ML									
	Sample	Ini d48ML		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L	5.47		PAH =	2064.151					
	Subsampled	0.0053								
	Concentration O&G in ACN	0.00265								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L	
4	Fluorene	nd	104.85	0.21	214.44	0.21	0.21			
5	phenanthrene	nd	106.37	0.21	190.85	0.19	0.20			
6	anthracene	24.9	222.14	0.44	488.58	0.49	0.47	53.38	110.19	0.1102
7	fluoranthrene	nd	33.89	0.07	144.67	0.14	0.11			
8	pyrene	25.17	81.74	0.16	169.80	0.17	0.17	151.04	311.78	0.3118
9	benzo(a) anthracene	54.64	108	0.22	212	0.21	0.21	255.33	527.03	0.5270
10	chrysene									
11	benzo(b)fluoranthene	25.6	84.84	0.17	173.90	0.17	0.17	149.02	307.60	0.3076
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	53.96	52.54	0.11	78.78	0.08	0.09	586.97	1211.59	1.2116
15	benzo(ghi) perelene	187.3	358.80	0.72	730.90	0.73	0.72	258.61	533.81	0.5338
16	Indeno(1,23cd)pyrene	79.2	53.75	0.11	110.89	0.11	0.11	725.31	1497.14	1.4971

File: A:\PAH0250.D
Operator: suhana
Date Acquired: 10/10/96 13:26:28
Method File Name: SUPAHS.M
Sample Name: icstr2 day 48
Misc Info:
Bottle Number: 1



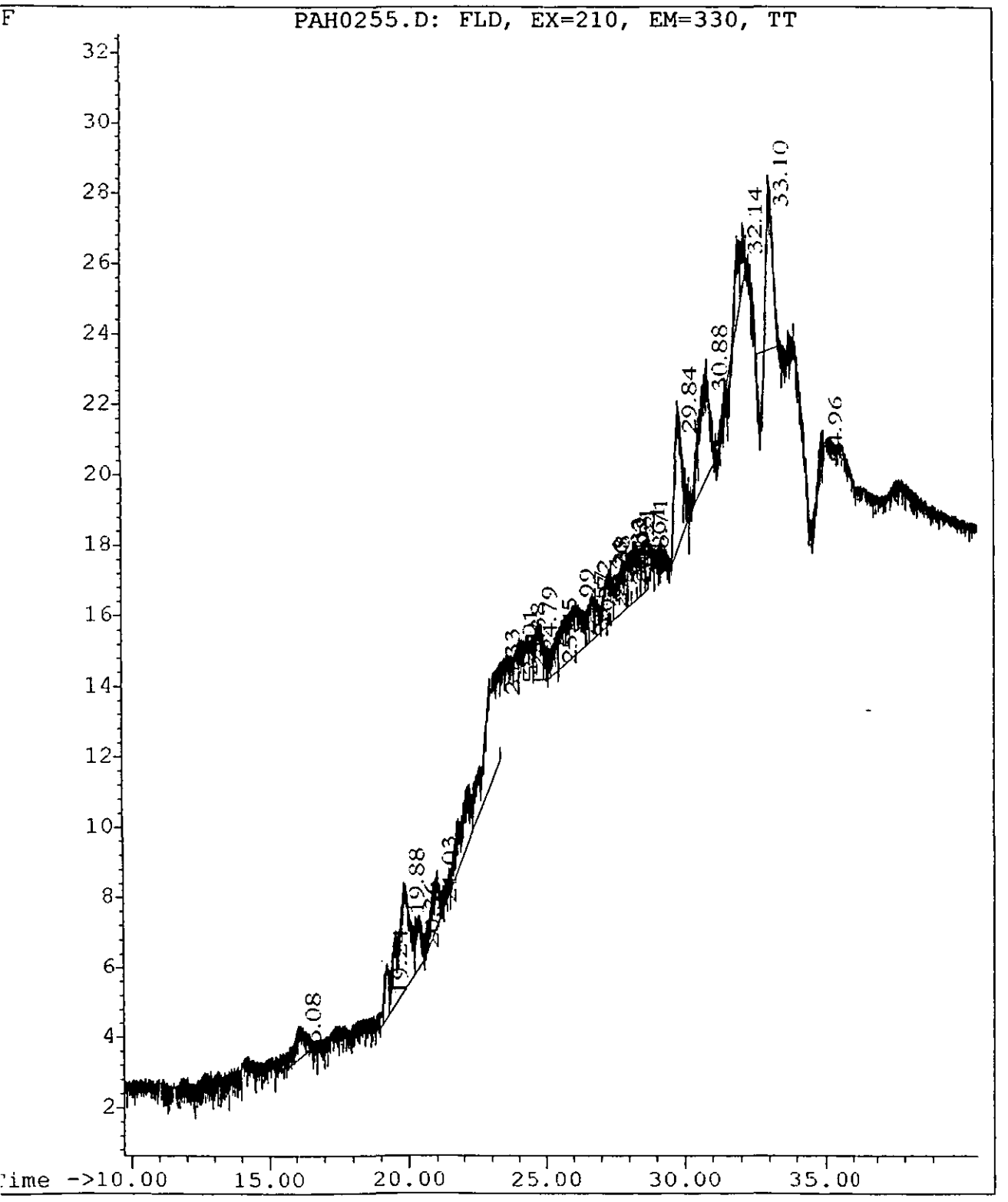
	Inipol Day 62 ML									
	Sample	Ini d 62		Multiplication factor to convert subsampled oil to ng/L						
	O&G/L	5.2267		PAH =	1979.811					
	Subsampled	0.00528								
	Concentration O&G in ACN	0.00264								
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L	
4	Fluorene	nd	104.85	0.21	214.44	0.21	0.21			
5	phenanthrene	2.77	106.37	0.21	190.85	0.19	0.20	13.7268	27.17632	0.0272
6	anthracene	nd	222.14	0.44	488.58	0.49	0.47			
7	fluoranthrene	nd	33.89	0.07	144.67	0.14	0.11			
8	pyrene	nd	81.74	0.16	169.80	0.17	0.17			
9	benzo(a) anthracene	53.39	108	0.22	212	0.21	0.21	249.486	493.9323	0.4939
10	chrysene									
11	benzo(b)fluoranthene	15.48	84.84	0.17	173.90	0.17	0.17	90.11002	178.3998	0.1784
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*			
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*			
14	dibenzo(a,h)anthracene	62.63	52.54	0.11	78.78	0.08	0.09	681.2792	1348.797	1.3488
15	benzo(ghi) perelene	144	358.80	0.72	730.90	0.73	0.72	198.8264	393.6365	0.3936
16	Indeno(1,23cd)pyrene	99.87	53.75	0.11	110.89	0.11	0.11	914.6023	1810.73	1.8107

File: A:\PAH0257.D
Operator: suhana
Date Acquired: 25/10/96 17:00:54
Method File Name: SUPAHS.M
Sample Name: CSTRI sett MLd62
Misc Info:
Bottle Number: 1



	Inipol Day 62 Final Settled Solids										
	Sample	Inipol d62 bs		Multiplication factor to convert subsampled oil to ng/L							
	O&G/kg (g/kg)	166/kg		PAH =	75333.3						
	Subsampled	0.0060g									
2mls	Concentration O&G in ACN	0.003									
		FLD	Area	factor	Area	factor	avg factor	equivalent	x MF/1000	ppm	UTS
	Peak number	Area	std 500ng/ml		std 1000ng/ml			ng/ml	ug/L		ppm
4	Fluorene		104.85	0.21	214.44	0.21	0.21				
5	phenanthrene	3.03	106.37	0.21	190.85	0.19	0.20	15.02	1131.147	1.13	5.60
6	anthracene	6.58	222.14	0.44	488.58	0.49	0.47	14.11	1062.738	1.06	3.4
7	fluoranthrene		33.89	0.07	144.67	0.14	0.11				
8	pyrene	13.25	81.74	0.16	169.80	0.17	0.17	79.51	5989.956	5.99	8.2
9	benzo(a) anthracene	94.12	108	0.22	212	0.21	0.21	439.81	33132.57	33.13	8.2
10	chrysene										
11	benzo(b)fluoranthene	13.26	84.84	0.17	173.90	0.17	0.17	77.19	5814.771	5.81	
12	*benzo(k)Fluoranthene*		*459.50*	*0.92*	*920.50*	*0.92*	*0.92*				
13	*benzo(a)pyrene*		*109.20*	*0.22*	*247.71*	*0.25*	*0.23*				3.4
14	dibenzo(a,h)anthracene	69.12	52.54	0.11	78.78	0.08	0.09	751.88	56641.33	56.64	
15	benzo(ghi) perelene	79	358.80	0.72	730.90	0.73	0.72	109.08	8217.233	8.22	
16	Indeno(1,23cd)pyrene	120	53.75	0.11	110.89	0.11	0.11	1098.95	82787.64	82.79	

File: A:\PAH0255.D
Operator: suhana
Date Acquired: 25/10/96 14:27:24
Method File Name: SUPAHS.M
Sample Name: cstrI d62
Misc Info:
Bottle Number: 1



File: A:\PAH0243.D
Operator: suhana
Date Acquired: 9/10/96 17:16:40
Method File Name: SUPAHS.M
Sample Name: mousse air lift
Misc Info:
Bottle Number: 1