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APPENDIX A

Calculation of Air Volume

Calculations for Air Volume from Hi-Volume Air Sampler

The most common expression of high-volume air sampling data is in micrograms of suspended particulate per cubic metre of air, representing a 24 hr sampling period. Using typical results of such a sampling, an example calculation would proceed as follows:

VOLUME OF AIR. Sample airflow, corrected rotameter reading:

Clean filter	56 cfm
Filter after exposure	52 cfm
Average	54 cfm

Therefore,

$$\frac{54\ ft^3}{min} \times \frac{1440\ min}{24\ hr} = \frac{76{,}760\ ft^3}{24\ hr}$$

and

$$\frac{76{,}760\ ft^3}{24\ hr} \times \frac{0.0283\ m^3}{ft^3} = \frac{2172\ m^3}{24\ hr}$$

WEIGHT OF PARTICULATE, Tare weight of filter:

Before exposure	3.417
After exposure	3.925
	0.508 g = 508×10^3 µg

SUSPENDED-PARTICULATE CONCENTRATION

$$\frac{508 \times 10^3\ \mu g}{2172\ m^3} = \frac{234\ \mu g}{m^3},$$ per 24-hr sample

APPENDIX B

Selected PNA Standard

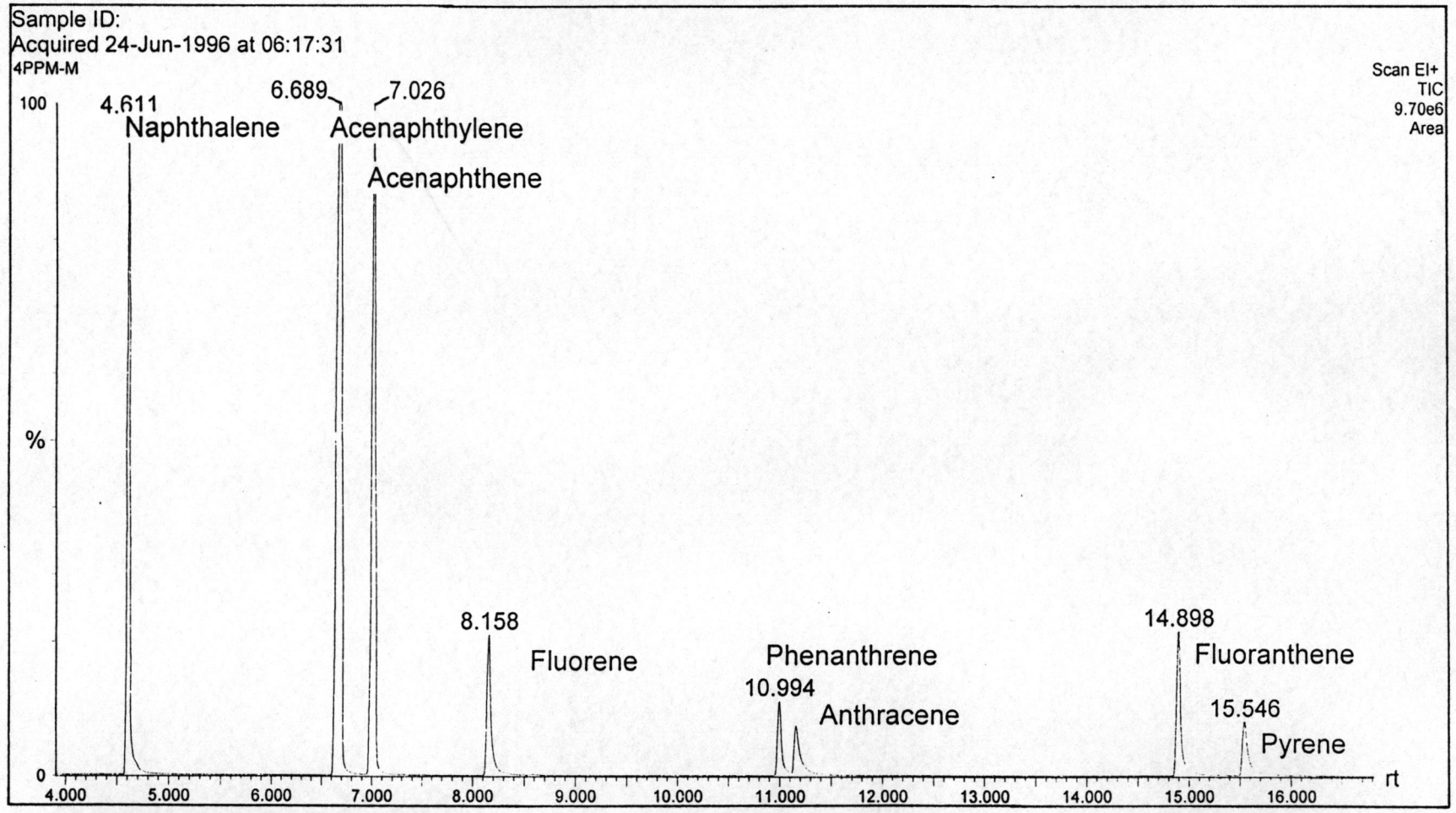


Figure B1 Gas Chromatogram of Standard PNA

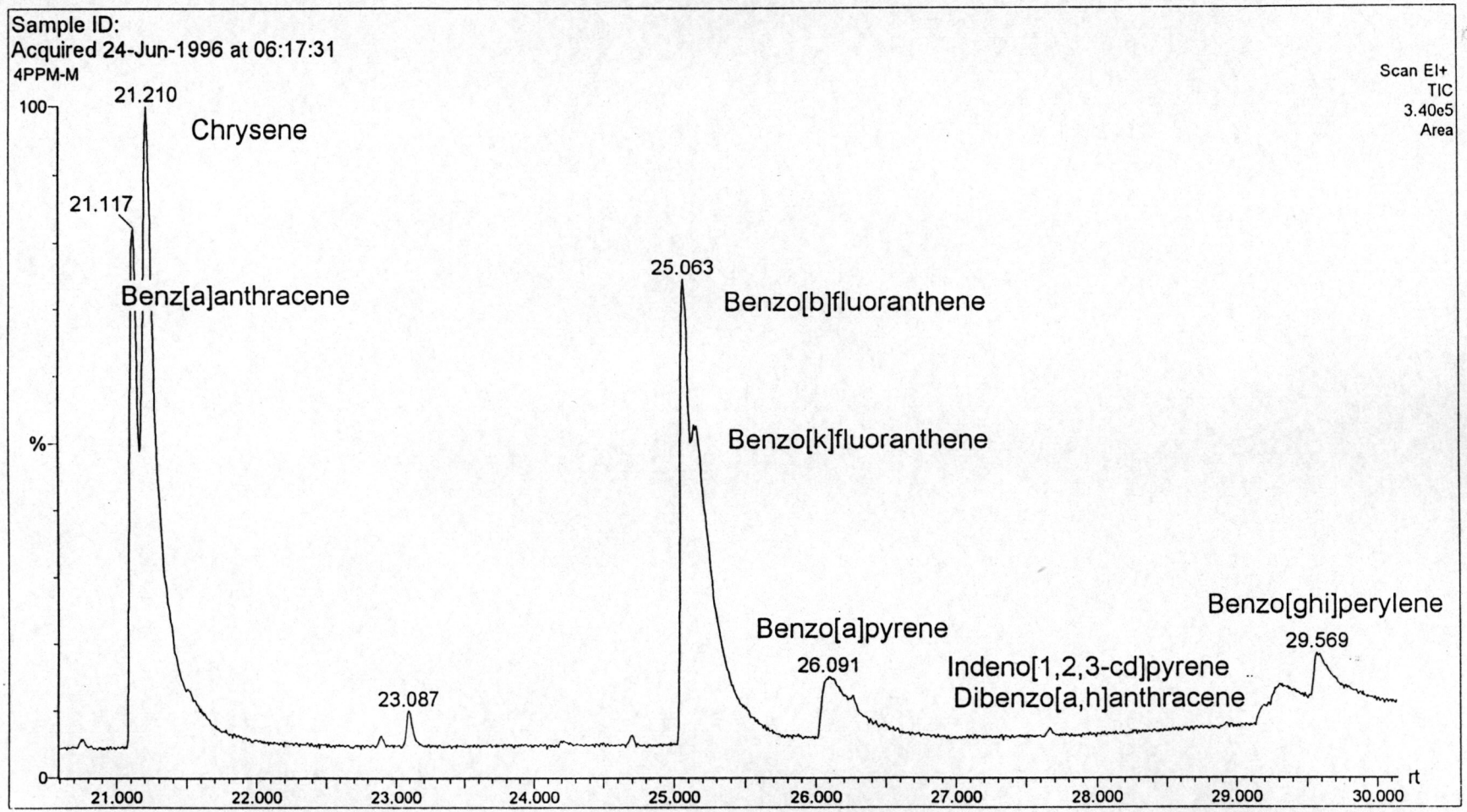
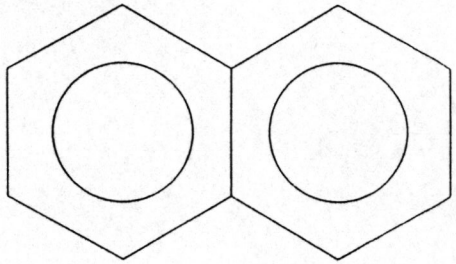
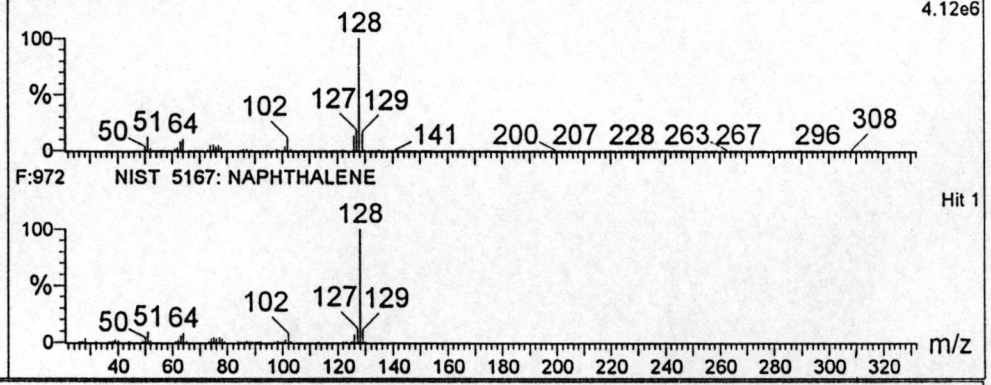


Figure B1 (continued) Gas Chromatogram of Standard PNA

Compound Name: NAPHTHALENE
Synonym: Albocarbon
Molecular Weight: 128



Sample ID:
Acquired 24-Jun-1996 at 06:17:31
Library: NIST
Forward Fit: 972, Reverse Fit: 978

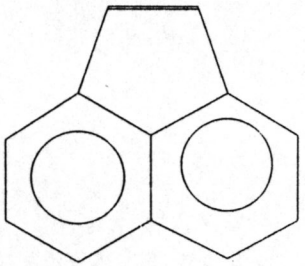


Data File: 4PPM-M
Sample ID:
Acquired 06:17:31 at 06:17:31

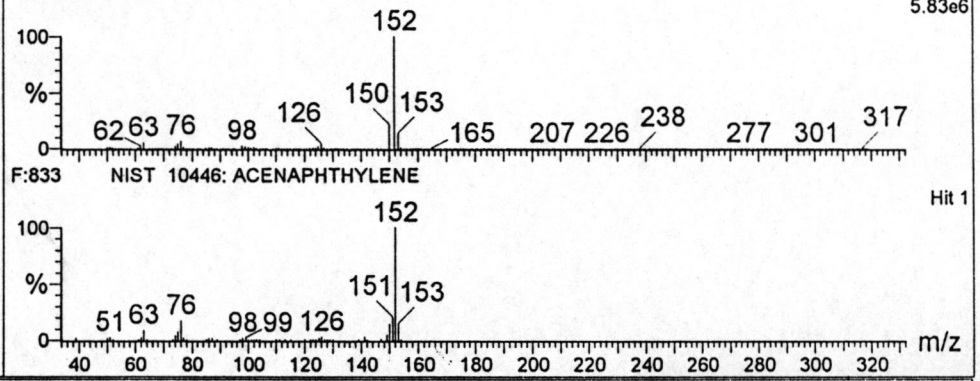
Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	NAPHTHALENE	C10H8	128	972	976	91-20-3	NIST	5167
2	AZULENE	C10H8	128	960	964	275-51-4	NIST	5166
3	1H-INDENE, 1-METHYLENE-	C10H8	128	940	978	2471-84-3	NIST	5168
4	CYCLOPROP A INDENE, 6-BROMO-1,1A,6,6A-TETRA	C10H9Br	208	712	720	55780-41-1	NIST	24774
5	1H-INDENE, 1-METHYL-	C10H10	130	487	490	767-59-9	NIST	5574

Figure B2 Comparison of Mass Spectrum of Standard Naphthalene with Mass Spectrum in NIST Library

Compound Name: ACENAPHTHYLENE
Synonym: Cyclopenta[de]naphthalene
Molecular Weight: 152



Sample ID:
Acquired 24-Jun-1996 at 06:17:31
Library: NIST
Forward Fit: 833, Reverse Fit: 838

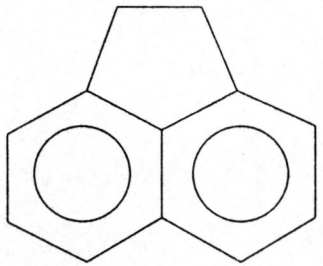


Data File: 4PPM-M
Sample ID:
Acquired 06:17:31 at 06:17:31

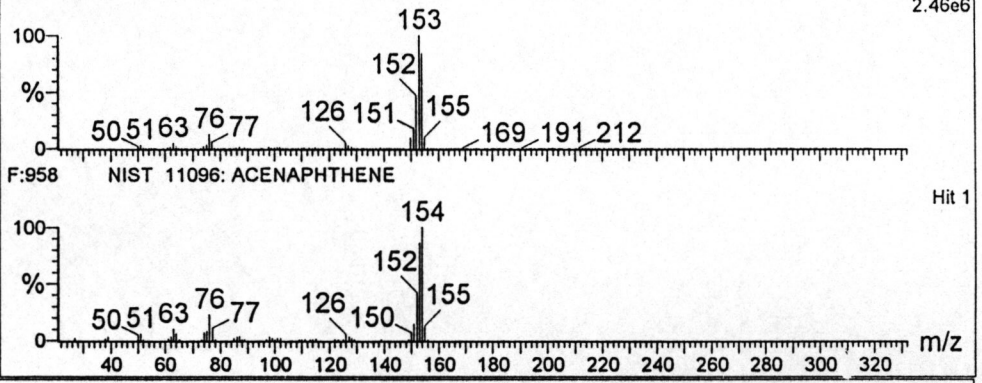
Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	ACENAPHTHYLENE	C12H8	152	833	838	208-96-8	NIST	10446
2	BIPHENYLENE	C12H8	152	773	779	259-79-0	NIST	10447
3	1H-PHENALEN-1-ONE	C13H8O	180	662	669	548-39-0	NIST	17920
4	BENZO C CINNOLINE	C12H8N2	180	550	562	230-17-1	NIST	17854
5	ACENAPHTHENE	C12H10	154	501	504	83-32-9	NIST	11096
6	9H-FLUOREN-9-ONE	C13H8O	180	477	484	486-25-9	NIST	17921
7	5-IODOACENAPHTHENE	C12H9I	280	455	472	0-00-0	NIST	39358
8	9,10-PHENANTHRENEDIONE	C14H8O2	208	455	467	84-11-7	NIST	24944
9	1,1'-BIPHENYL, 2-CHLORO-	C12H9Cl	188	451	458	2051-60-7	NIST	19889
10	1,1'-BIPHENYL, 4-CHLORO-	C12H9Cl	188	433	442	2051-62-9	NIST	19891
11	1,1'-BIPHENYL, 3-CHLORO-	C12H9Cl	188	424	431	2051-61-8	NIST	19890
12	1,2-BENZENEDICARBOXYLIC ACID, 4-HYDROXY-	C8H6O5	182	209	227	610-35-5	NIST	18219

Figure B3 Comparison of Mass Spectrum of Standardstandard Acenaphthylene with Mass Spectrum in NIST Library

Compound Name: ACENAPHTHENE
Synonym: Acenaphthylene, 1,2-dihydro-
Molecular Weight: 154



Sample ID:
Acquired 24-Jun-1996 at 06:17:31
Library: NIST
Forward Fit: 958, Reverse Fit: 960
4PPM-M 488 (7.026) Rf (6,3.000)

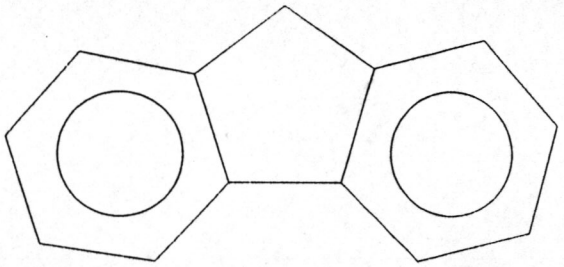


Data File: 4PPM-M
Sample ID:
Acquired 06:17:31 at 06:17:31

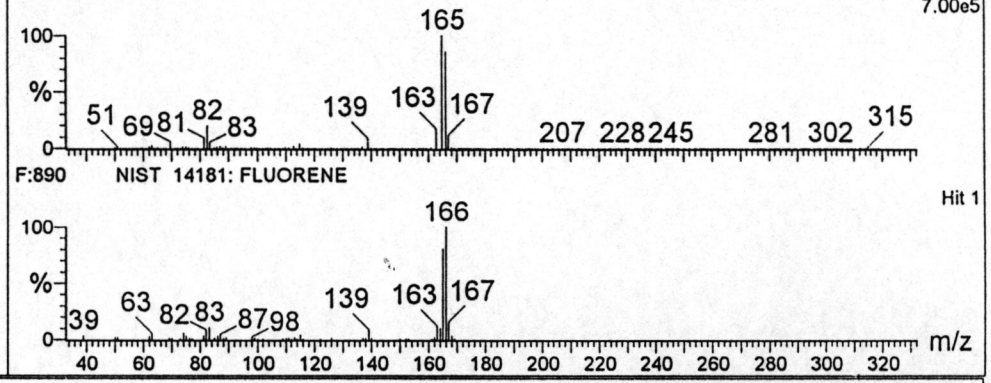
Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	ACENAPHTHENE	C12H10	154	958	960	83-32-9	NIST	11096
2	NAPHTHALENE, 2-ETHENYL-	C12H10	154	902	904	827-54-3	NIST	11097
3	1,4-ETHENONAPHTHALENE, 1,4-DIHYDRO-	C12H10	154	886	909	7322-47-6	NIST	11095
4	BIPHENYL	C12H10	154	859	865	92-52-4	NIST	11094
5	BENZENE, (2,4-CYCLOPENTADIEN-1-YLIDENEMETHY	C12H10	154	789	916	7338-50-3	NIST	11092
6	ACENAPHTHYLENE, 5-BROMO-1,2-DIHYDRO-	C12H9Br	232	689	696	2051-98-1	NIST	30279
7	5,10-METHANOBENZOCYCLOOCTEN-11-ONE, 5-CHLOR	C13H9OCl	216	605	618	33655-73-1	NIST	26755
8	1,1'-BIPHENYL, 3-NITRO-	C12H9O2N	199	558	561	2113-58-8	NIST	22640
9	1,1'-BIPHENYL, 2-IODO-	C12H9I	280	458	464	2113-51-1	NIST	39360
10	5-IODOACENAPHTHENE	C12H9I	280	457	487	0-00-0	NIST	39358
11	1,4-ANTHRACENEDIONE	C14H8O2	208	350	362	635-12-1	NIST	24946

Figure B4 Comparison of Mass Spectrum of Standard Acenaphthene with Mass Spectrum in NIST Library

Compound Name: FLUORENE
Synonym: 9H-Fluorene
Molecular Weight: 166



Sample ID:
Acquired 24-Jun-1996 at 06:17:31
Library: NIST
Forward Fit: 890, Reverse Fit: 897

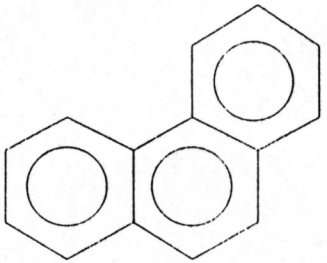


Data File: 4PPM-M
Sample ID:
Acquired 06:17:31 at 06:17:31

Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	FLUORENE	C13H10	166	890	897	86-73-7	NIST	14181
2	1H-PHENALENE	C13H10	166	862	887	203-80-5	NIST	14180
3	9H-FLUORENE-9-CARBOXYLIC ACID	C14H10O2	210	800	891	1989-33-9	NIST	25424
4	FLUORENE-9-METHANOL	C14H12O	196	732	773	24324-17-2	NIST	21953
5	2-FLUORENECARBOXALDEHYDE	C14H10O	194	730	739	30084-90-3	NIST	21400
6	ETHANONE, DIAZODIPHENYL-	C14H10ON2	222	636	681	3469-17-8	NIST	28140
7	FLUORENE, 2,4A-DIHYDRO-	C13H12	168	565	632	59247-36-8	NIST	14805
8	BENZENE, 1,1'-(CHLOROMETHYLENE)BIS-	C13H11Cl	202	517	551	90-99-3	NIST	23396
9	BENZO C CINNOLINE, 4-METHYL-	C13H10N2	194	517	584	19174-78-8	NIST	21358
10	DIPHENYLMETHOXY ACETIC ACID	C15H14O3	242	431	463	21409-25-6	NIST	32370

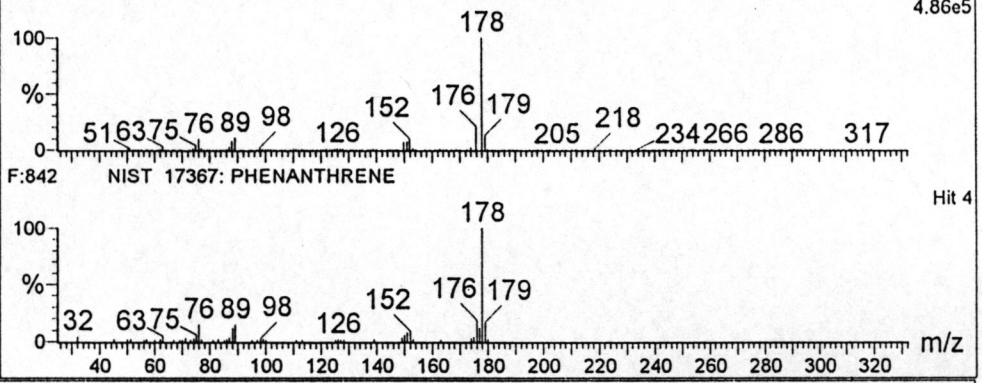
Figure B5 Comparison of Mass Spectrum of Standard Fluorene with Mass Spectrum in NIST Library

Compound Name: PHENANTHRENE
Synonym: Phenanthren
Molecular Weight: 178



Sample ID:
Acquired 24-Jun-1996 at 06:17:31
Library: NIST
Forward Fit: 842, Reverse Fit: 855

4PPM-M 1081 (10.994) Cm (1080:1082-(1098:1100+1063:1068))

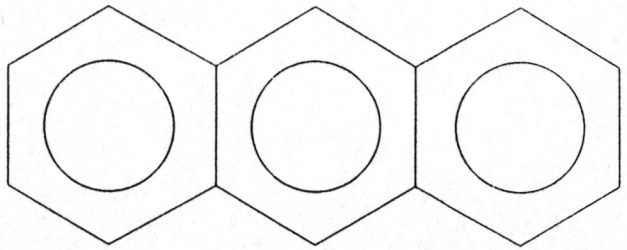


Data File: 4PPM-M
Sample ID:
Acquired 06:17:31 at 06:17:31

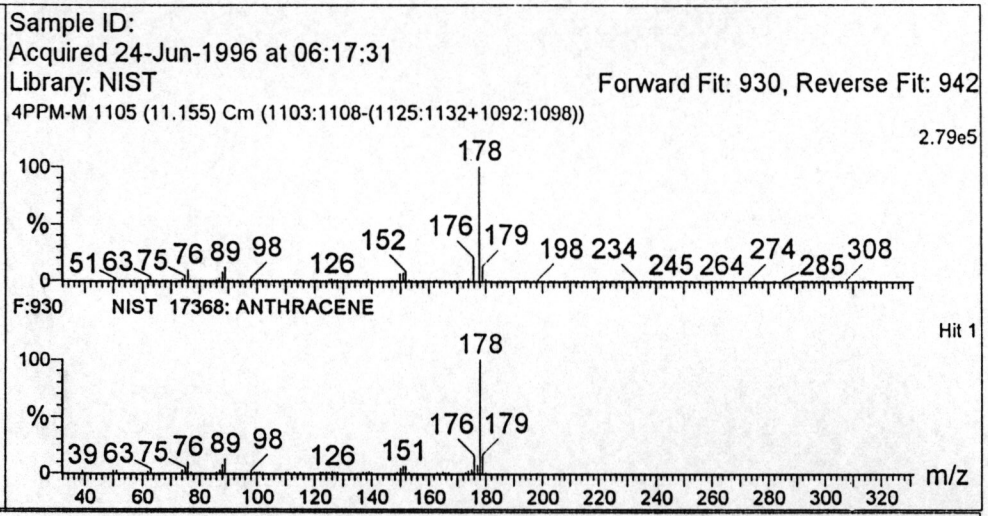
Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	ANTHRACENE	C14H10	178	927	930	120-12-7	NIST	17368
2	9H-FLUORENE, 9-METHYLENE-	C14H10	178	880	942	4425-82-5	NIST	17369
3	DIPHENYLETHYNE	C14H10	178	866	868	501-65-5	NIST	17370
4	PHENANTHRENE	C14H10	178	842	855	85-01-8	NIST	17367
5	5H-DIBENZO A,D CYCLOHEPTEN-5-ONE	C15H10O	206	707	710	2222-33-5	NIST	24438
6	ANTHRACENE, 9,10-DIHYDRO-	C14H12	180	600	606	613-31-0	NIST	17960
7	CINNOLINE, 3-PHENYL-	C14H10N2	206	578	623	10604-22-5	NIST	24393

Figure B6 Comparison of Mass Spectrum of Standard Phenanthrene with Mass Spectrum in NIST Library

Compound Name: ANTHRACENE
Synonym: Anthracin
Molecular Weight: 178



Sample ID:
Acquired 24-Jun-1996 at 06:17:31
Library: NIST
Forward Fit: 930, Reverse Fit: 942

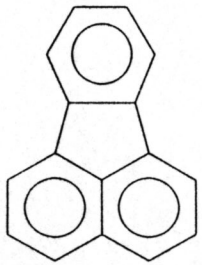


Data File: 4PPM-M
Sample ID:
Acquired 06:17:31 at 06:17:31

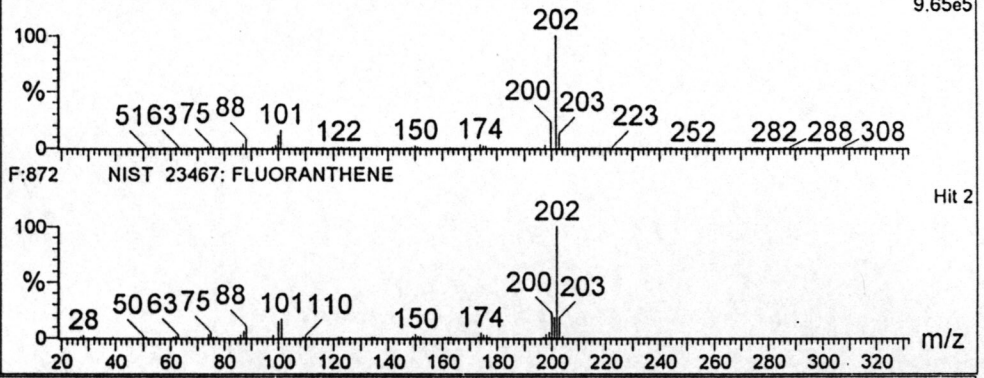
Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	ANTHRACENE	C14H10	178	930	933	120-12-7	NIST	17368
2	9H-FLUORENE, 9-METHYLENE-	C14H10	178	881	942	4425-82-5	NIST	17369
3	DIPHENYLETHYNE	C14H10	178	863	866	501-65-5	NIST	17370
4	PHENANTHRENE	C14H10	178	847	859	85-01-8	NIST	17367
5	5H-DIBENZO A,D CYCLOHEPTEN-5-ONE	C15H10O	206	705	708	2222-33-5	NIST	24438
6	ANTHRACENE, 9,10-DIHYDRO-	C14H12	180	603	608	613-31-0	NIST	17960
7	CINNOLINE, 3-PHENYL-	C14H10N2	206	576	620	10604-22-5	NIST	24393

Figure B7 Comparison of Mass Spectrum of Standard Anthracene with Mass Spectrum in NIST Library

Compound Name: FLUORANTHENE
Synonym: Benzene, 1,2-(1,8-naphthalenediyl)-
Molecular Weight: 202



Sample ID:
Acquired 24-Jun-1996 at 06:17:31
Library: NIST
Forward Fit: 872, Reverse Fit: 888

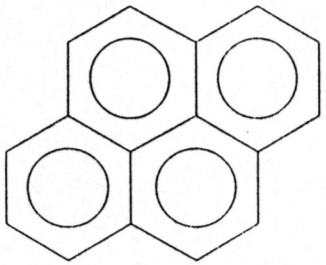


Data File: 4PPM-M
Sample ID:
Acquired 06:17:31 at 06:17:31

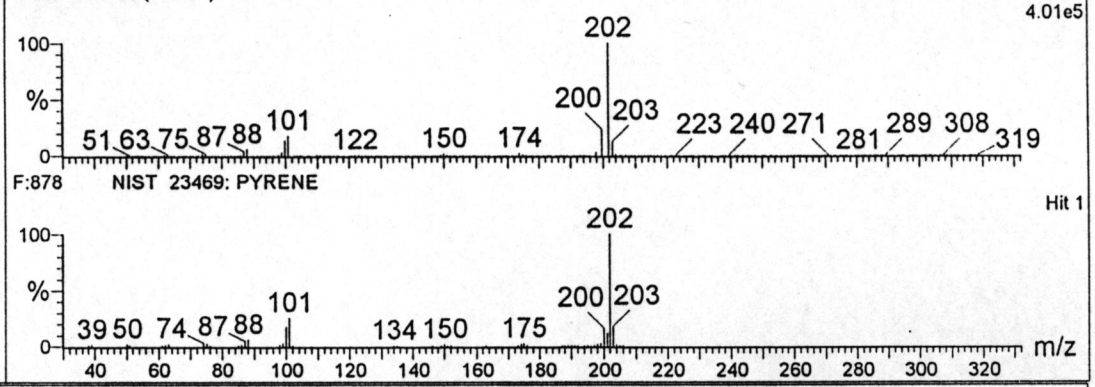
Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	PYRENE	C16H10	202	877	894	129-00-0	NIST	23469
2	FLUORANTHENE	C16H10	202	872	888	206-44-0	NIST	23467
3	BENZENE, 1,1'-(1,3-BUTADIYNE-1,4-DIYL)BIS-	C16H10	202	848	851	886-66-8	NIST	23468
4	7H-BENZ DE ANTHRACEN-7-ONE	C17H10O	230	538	541	82-05-3	NIST	30040
5	1-PYRENE-CARBOXALDEHYDE	C17H10O	230	425	430	3029-19-4	NIST	30041

Figure B8 Comparison of Mass Spectrum of Standard Fluoranthene with Mass Spectrum in NIST Library

Compound Name: PYRENE
Synonym: á-Pyrene
Molecular Weight: 202



Sample ID:
Acquired 24-Jun-1996 at 06:17:31
Library: NIST
Forward Fit: 878, Reverse Fit: 894

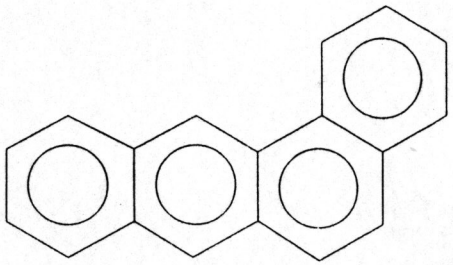


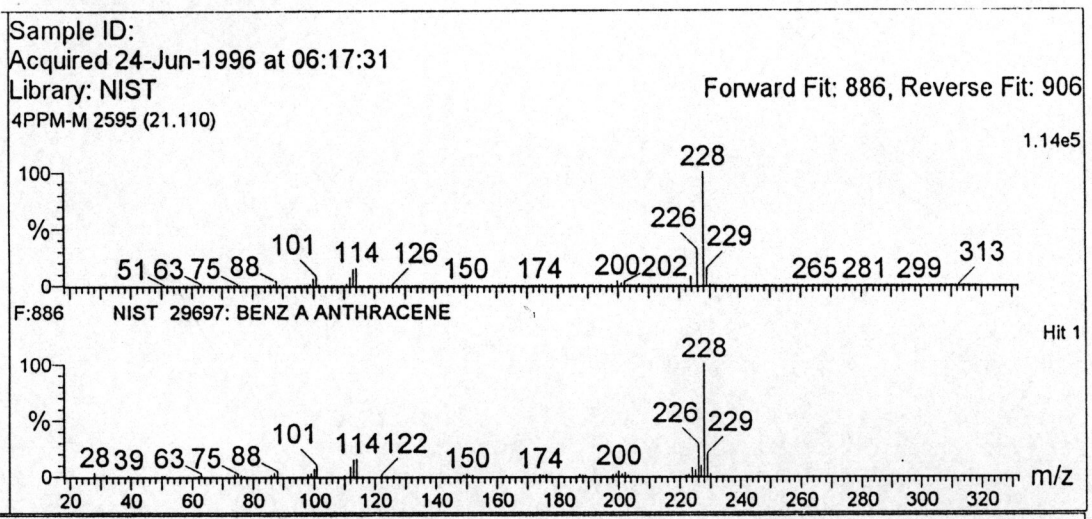
Data File: 4PPM-M
Sample ID:
Acquired 06:17:31 at 06:17:31

Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	PYRENE	C16H10	202	878	894	129-00-0	NIST	23469
2	FLUORANTHENE	C16H10	202	856	874	206-44-0	NIST	23467
3	BENZENE, 1,1'-(1,3-BUTADIYNE-1,4-DIYL)BIS-	C16H10	202	813	818	886-66-8	NIST	23468
4	7H-BENZ DE ANTHRACEN-7-ONE	C17H10O	230	529	533	82-05-3	NIST	30040
5	1-PYRENE-CARBOXALDEHYDE	C17H10O	230	429	433	3029-19-4	NIST	30041

Figure B9 Comparison of Mass Spectrum of Standard Pyrene with Mass Spectrum in NIST Library

Compound Name: BENZ A ANTHRACENE
Synonym: Benzanthracene
Molecular Weight: 228



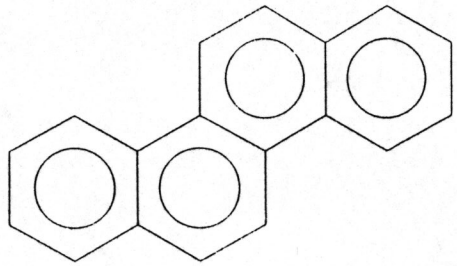


Data File: 4PPM-M
Sample ID:
Acquired 06:17:31 at 06:17:31

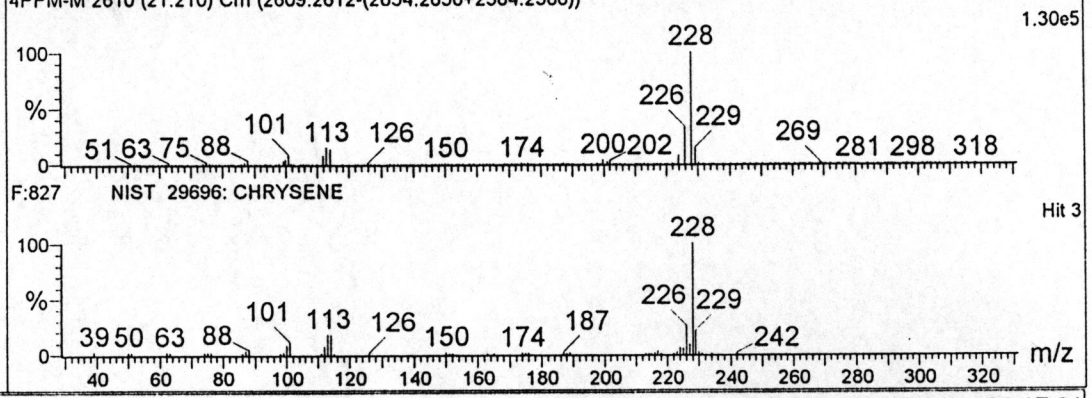
Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	BENZ A ANTHRACENE	C18H12	228	886	906	56-55-3	NIST	29697
2	NAPHTHACENE	C18H12	228	867	884	92-24-0	NIST	29693
3	CHRYSENE	C18H12	228	827	875	218-01-9	NIST	29696
4	TRIPHENYLENE	C18H12	228	816	839	217-59-4	NIST	29698
5	BENZO C PHENANTHRENE	C18H12	228	790	808	195-19-7	NIST	29694
6	NAPHTHACENE, 5,12-DIHYDRO-	C18H14	230	611	623	959-02-4	NIST	30045

Figure B10 Comparison of Mass Spectrum of Standard Benzo[a]anthracene with Mass Spectrum in NIST Library

Compound Name: CHRYSENE
Synonym: Benzo[a]phenanthrene
Molecular Weight: 228



Sample ID:
Acquired 24-Jun-1996 at 06:17:31
Library: NIST
Forward Fit: 827, Reverse Fit: 869

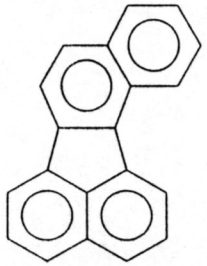


Data File: 4PPM-M
Sample ID:
Acquired 06:17:31 at 06:17:31

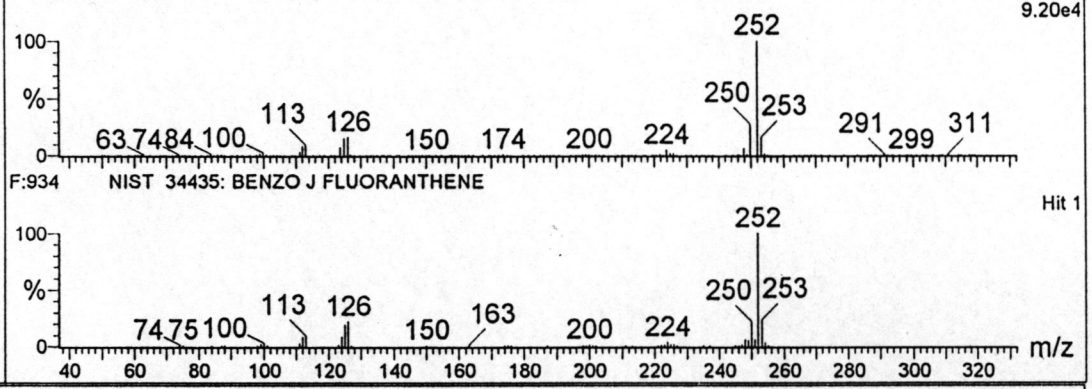
Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	BENZ A ANTHRACENE	C18H12	228	905	912	56-55-3	NIST	29697
2	NAPHTHACENE	C18H12	228	865	876	92-24-0	NIST	29693
3	CHRYSENE	C18H12	228	827	869	218-01-9	NIST	29696
4	TRIPHENYLENE	C18H12	228	818	834	217-59-4	NIST	29698
5	BENZO C PHENANTHRENE	C18H12	228	805	814	195-19-7	NIST	29694
6	NAPHTHACENE, 5,12-DIHYDRO-	C18H14	230	605	613	959-02-4	NIST	30045

Figure B11 Comparison of Mass Spectrum of Standard Chrysene and with Mass Spectrum in NIST Library

Compound Name: BENZO J FLUORANTHENE
Synonym: Benzo-10,11-fluoranthene
Molecular Weight: 252



Sample ID:
Acquired 24-Jun-1996 at 06:17:31
Library: NIST
Forward Fit: 934, Reverse Fit: 940

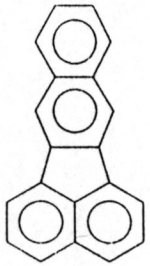


Data File: 4PPM-M
Sample ID:
Acquired 06:17:31 at 06:17:31

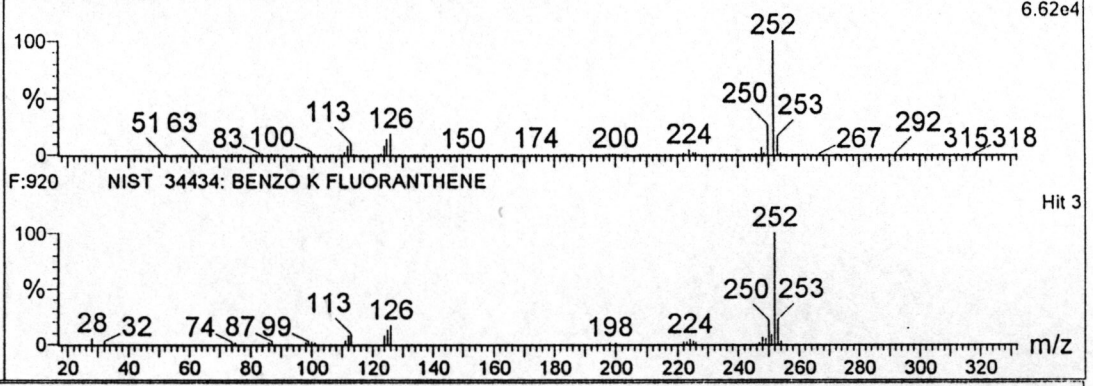
Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	BENZO J FLUORANTHENE	C20H12	252	934	939	205-82-3	NIST	34435
2	BENZO K FLUORANTHENE	C20H12	252	919	940	207-08-9	NIST	34434
3	BENZ E ACEPHENANTHRYLENE	C20H12	252	916	925	205-99-2	NIST	34432
4	BENZO E PYRENE	C20H12	252	899	905	192-97-2	NIST	34433
5	PERYLENE	C20H12	252	893	913	198-55-0	NIST	34430
6	BENZO A PYRENE	C20H12	252	754	766	50-32-8	NIST	34431
7	BENZO A PYRENE, 4,5-DIHYDRO-	C20H14	254	608	634	57652-66-1	NIST	34832
8	1H-INDENE, 1,1'-(1,2-ETHANEDIYLIDENE)BIS-	C20H14	254	598	675	72088-04-1	NIST	34834
9	1,1'-BINAPHTHALENE	C20H14	254	597	633	604-53-5	NIST	34830
10	ANTHRACENE, 9-PHENYL-	C20H14	254	548	580	602-55-1	NIST	34833
11	9H-FLUORENE, 9-(PHENYLMETHYLENE)-	C20H14	254	536	562	1836-87-9	NIST	34828

Figure B12 Comparison of Mass Spectrum of Standard Benzo[b]fluoranthene with Mass Spectrum in NIST Library

Compound Name: BENZO K FLUORANTHENE
Synonym: Dibenzo[b,jk]fluorene
Molecular Weight: 252



Sample ID:
Acquired 24-Jun-1996 at 06:17:31
Library: NIST
Forward Fit: 920, Reverse Fit: 936

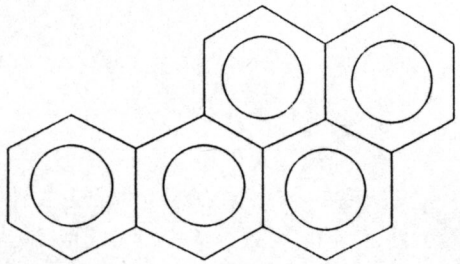


Data File: 4PPM-M
Sample ID:
Acquired 06:17:31 at 06:17:31

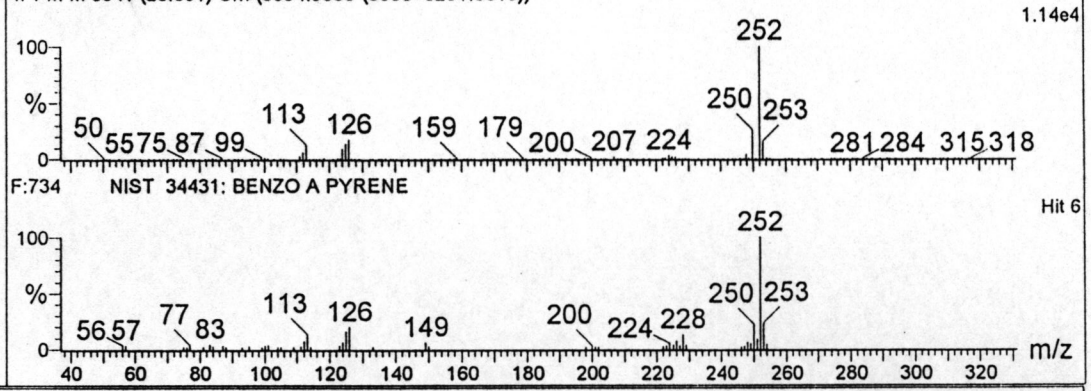
Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	BENZO J FLUORANTHENE	C20H12	252	940	947	205-82-3	NIST	34435
2	BENZ E ACEPHENANTHRYLENE	C20H12	252	926	936	205-99-2	NIST	34432
3	BENZO K FLUORANTHENE	C20H12	252	920	943	207-08-9	NIST	34434
4	BENZO E PYRENE	C20H12	252	904	913	192-97-2	NIST	34433
5	PERYLENE	C20H12	252	897	917	198-55-0	NIST	34430

Figure B13 Comparison of Mass Spectrum of Standard Benzo[k]fluoranthene with Mass Spectrum in NIST Library

Compound Name: BENZO A PYRENE
Synonym: Benz[a]pyrene
Molecular Weight: 252



Sample ID:
Acquired 24-Jun-1996 at 06:17:31
Library: NIST
Forward Fit: 734, Reverse Fit: 757
4PPM-M 3341 (26.091) Cm (3334:3356-(3383+3291:3313))

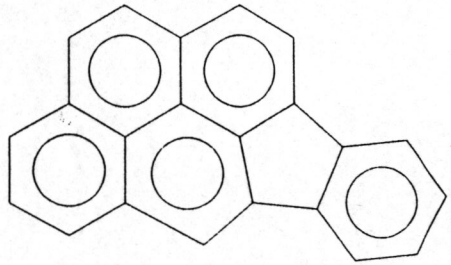


Data File: 4PPM-M
Sample ID:
Acquired 06:17:31 at 06:17:31

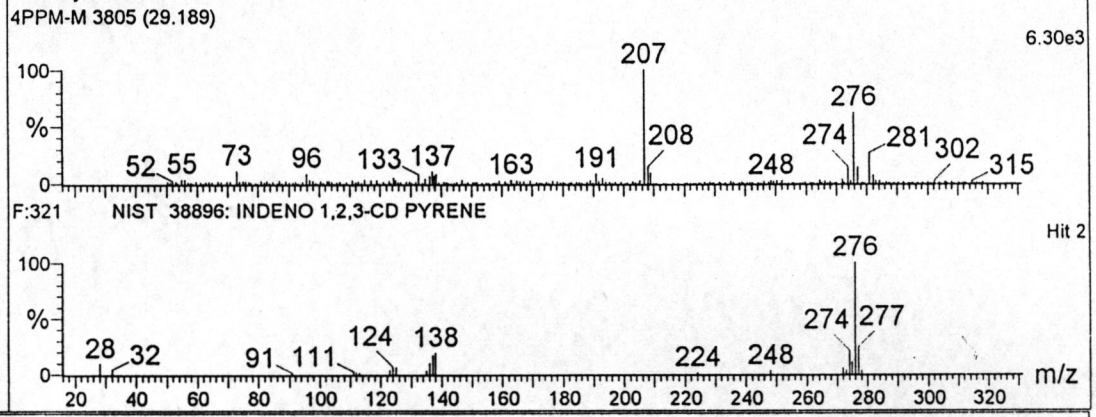
Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	BENZO J FLUORANTHENE	C20H12	252	912	935	205-82-3	NIST	34435
2	BENZO K FLUORANTHENE	C20H12	252	898	934	207-08-9	NIST	34434
3	BENZ E ACEPHENANTHRYLENE	C20H12	252	898	923	205-99-2	NIST	34432
4	BENZO E PYRENE	C20H12	252	882	906	192-97-2	NIST	34433
5	PERYLENE	C20H12	252	866	902	198-55-0	NIST	34430
6	BENZO A PYRENE	C20H12	252	734	757	50-32-8	NIST	34431
7	1H-INDENE, 1,1'-(1,2-ETHANEDIYLIDENE)BIS-	C20H14	254	602	674	72088-04-1	NIST	34834
8	BENZO A PYRENE, 4,5-DIHYDRO-	C20H14	254	600	630	57652-66-1	NIST	34832

Figure B14 Comparison of Mass Spectrum of Standard Benzo[a]pyrene with Mass Spectrum in NIST Library

Compound Name: INDENO 1,2,3-CD PYRENE
Synonym: o-Phenylenepyrene
Molecular Weight: 276



Sample ID:
Acquired 24-Jun-1996 at 06:17:31
Library: NIST
Forward Fit: 321, Reverse Fit: 835

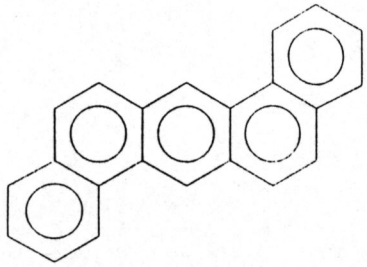


Data File: 4PPM-M
Sample ID:
Acquired 06:17:31 at 06:17:31

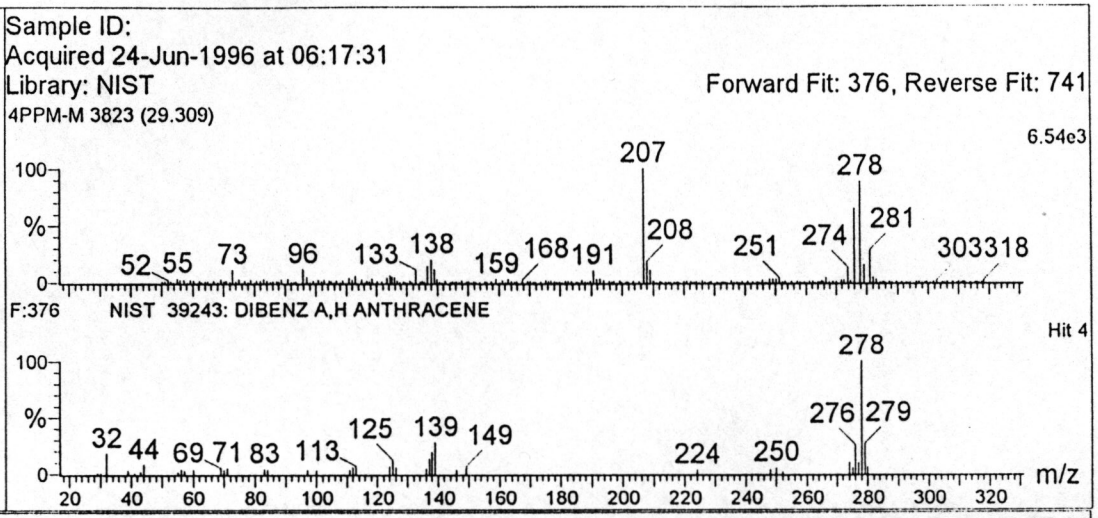
Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	3,3-DIETHOXY-1,1,1,5,5,5-HEXAMETHYLTRISILOX	C10H28O4Si3	296	376	705	0-00-0	NIST	41981
2	INDENO 1,2,3-CD PYRENE	C22H12	276	321	932	193-39-5	NIST	38896
3	BENZO GHI PERYLENE	C22H12	276	316	835	191-24-2	NIST	38894
4	1,1,1,3,5,7,7,7-OCTAMETHYLTETRASILOXANE	C8H26O3Si4	282	312	674	0-00-0	NIST	39662
5	DIBENZO DEF,MNO CHRYSENE	C22H12	276	297	767	191-26-4	NIST	38895
6	1,12-BENZPERYLENE	C22H12	276	297	806	0-00-0	NIST	38893
7	METHYLTRIS(TRIMETHYLSILOXY)SILANE	C10H30O3Si4	310	266	570	17928-28-8	NIST	44156
8	TRANYLCYPROMINE, PENTAFLUOROBENZOYL ESTER	C16H10ONF5	327	231	406	0-00-0	NIST	46452
9	TRIPROLIDINE	C19H22N2	278	180	306	486-12-4	NIST	39215
10	BENZENE, 1,2,3,5-TETRACHLORO-4,6-DIMETHYL-	C8H6Cl4	242	171	367	877-09-8	NIST	32224
11	BENZO B TRIPHENYLENE	C22H14	278	159	217	215-58-7	NIST	39238
12	PHENOL, 4-PHENYL-2',4',6'-TRICHLORO-	C12H7OCl3	272	158	250	14962-28-8	NIST	38016

Figure B15 Comparison of Mass Spectrum of Standard Indeno[1,2,3-cd]pyrene with Mass Spectrum in NIST Library

Compound Name: DIBENZ A,H ANTHRACENE
Synonym: Dibenzo[a,h]anthracene
Molecular Weight: 278



Sample ID:
Acquired 24-Jun-1996 at 06:17:31
Library: NIST
Forward Fit: 376, Reverse Fit: 741

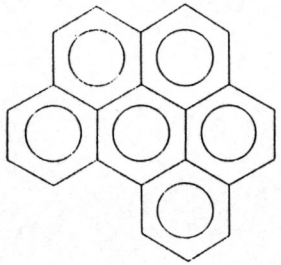


Data File: 4PPM-M
Sample ID:
Acquired 06:17:31 at 06:17:31

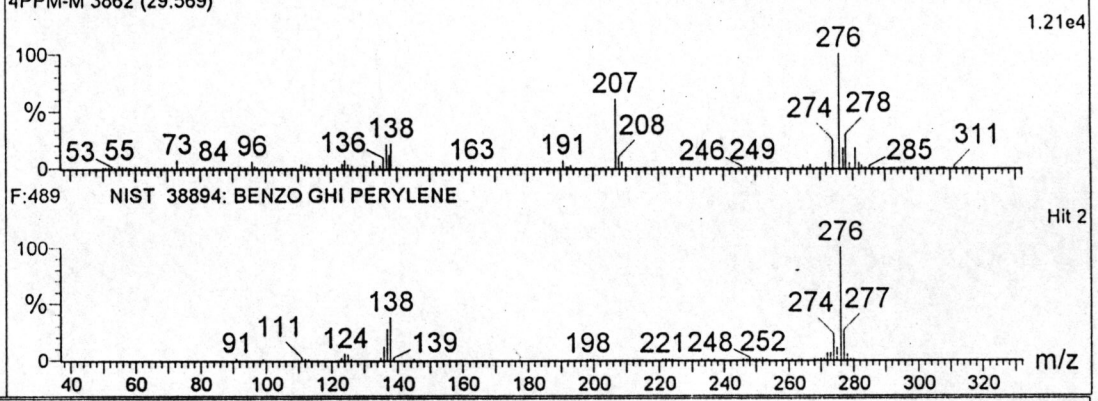
Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	BENZO B TRIPHENYLENE	C22H14	278	486	604	215-58-7	NIST	39238
2	BENZO B CHRYSENE	C22H14	278	428	728	214-17-5	NIST	39241
3	1,2:7,8-DIBENZPHENANTHRENE	C22H14	278	421	741	0-00-0	NIST	39237
4	DIBENZ A,H ANTHRACENE	C22H14	278	376	747	53-70-3	NIST	39243
5	BENZO A NAPHTHACENE	C22H14	278	371	862	226-88-0	NIST	39240
6	DIBENZ A,J ANTHRACENE	C22H14	278	369	852	224-41-9	NIST	39242
7	PENTACENE	C22H14	278	350	657	135-48-8	NIST	39239
8	CINNAMAL FLUORENE	C22H16	280	142	258	0-00-0	NIST	39525
9	4-(1,1'-BIPHENYL-2-YL)-7-CHLORO-1,2-DIHYDRO	C22H17Cl	316	129	282	0-00-0	NIST	45168
10	STANNANE, TRIMETHYL-2-NAPHTHALENYL-	C13H16Sn	292	126	251	945-77-7	NIST	41455
11	STANNANE, TRIMETHYL-1-NAPHTHALENYL-	C13H16Sn	292	103	214	944-85-4	NIST	41456

Figure B16 Comparison of Mass Spectrum of Standard Dibenzo[a,h]anthracene with Mass Spectrum in NIST Library

Compound Name: BENZO GHI PERYLENE
Synonym: Benzo-1,12-perylene
Molecular Weight: 276



Sample ID:
Acquired 24-Jun-1996 at 06:17:31
Library: NIST
Forward Fit: 489, Reverse Fit: 820



Data File: 4PPM-M
Sample ID:
Acquired 06:17:31 at 06:17:31

Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	INDENO 1,2,3-CD PYRENE	C22H12	276	490	866	193-39-5	NIST	38896
2	BENZO GHI PERYLENE	C22H12	276	489	820	191-24-2	NIST	38894
3	1,12-BENZPERYLENE	C22H12	276	454	769	0-00-0	NIST	38893
4	DIBENZO DEF,MNO CHRYSENE	C22H12	276	429	726	191-26-4	NIST	38895
5	BENZO B TRIPHENYLENE	C22H14	278	383	475	215-58-7	NIST	39238
6	1,2:7,8-DIBENZPHENANTHRENE	C22H14	278	355	562	0-00-0	NIST	39237
7	DIBENZ A,H ANTHRACENE	C22H14	278	296	527	53-70-3	NIST	39243
8	DIBENZ A,J ANTHRACENE	C22H14	278	268	540	224-41-9	NIST	39242
9	BENZO A NAPHTHACENE	C22H14	278	264	532	226-88-0	NIST	39240

Figure B17 Comparison of Mass Spectrum of Standard Benzo[ghi]perylene with Mass Spectrum in NIST Library

APPENDIX C

Chromatogram of Sampling Areas

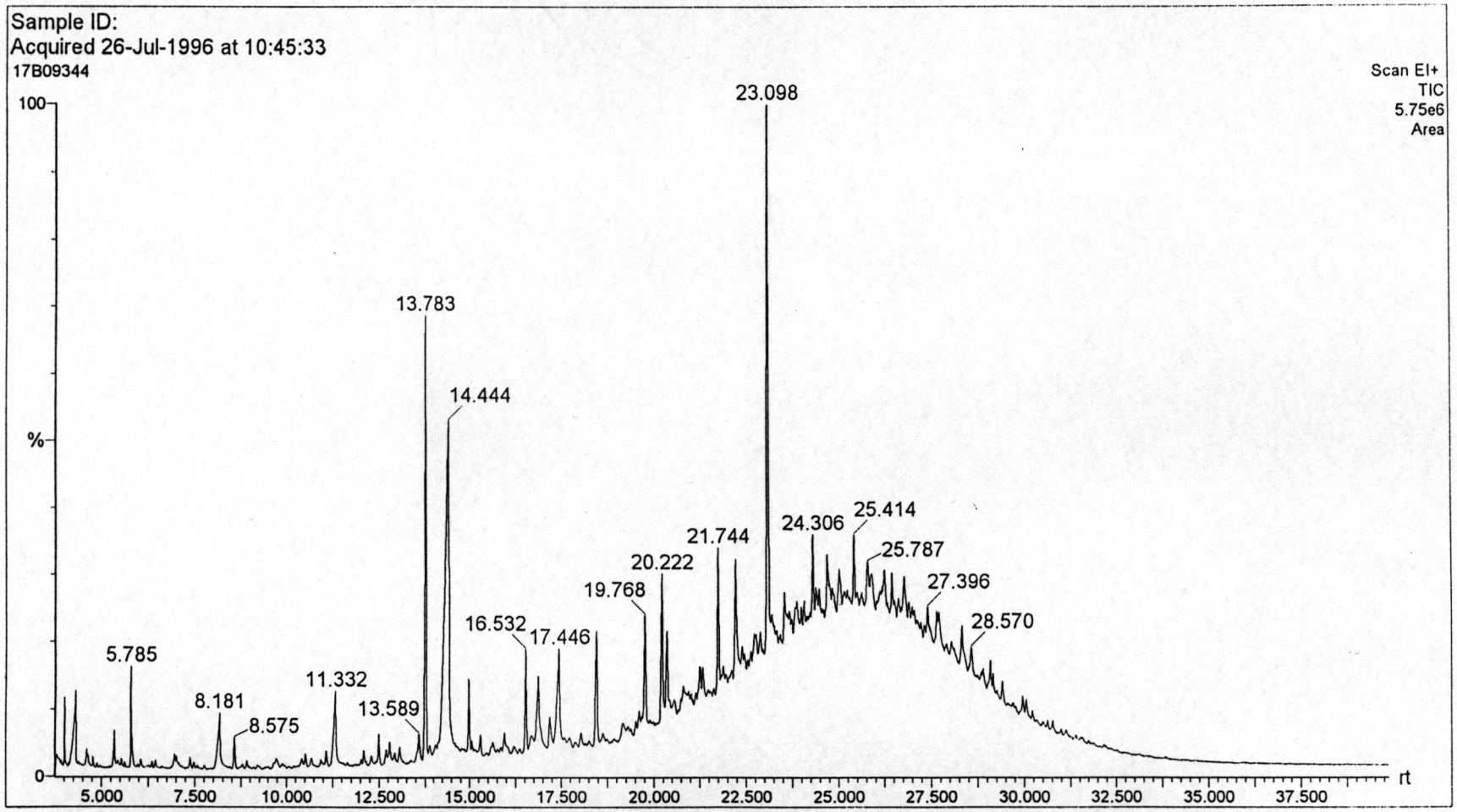


Figure C-1 Chromatogram of Pratunam Samples

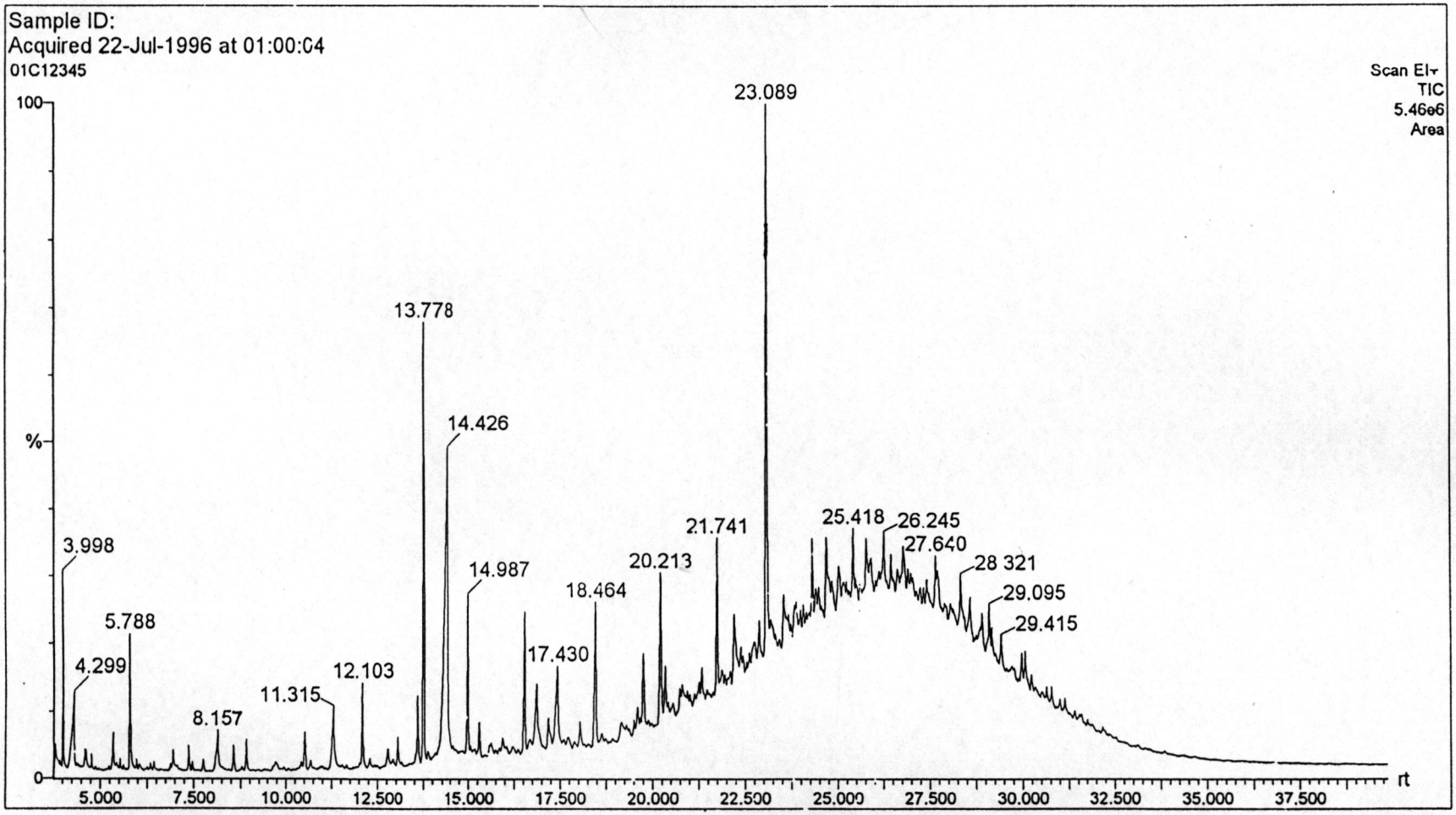


Figure C-2 Chromatogram of Yaowaraj Samples

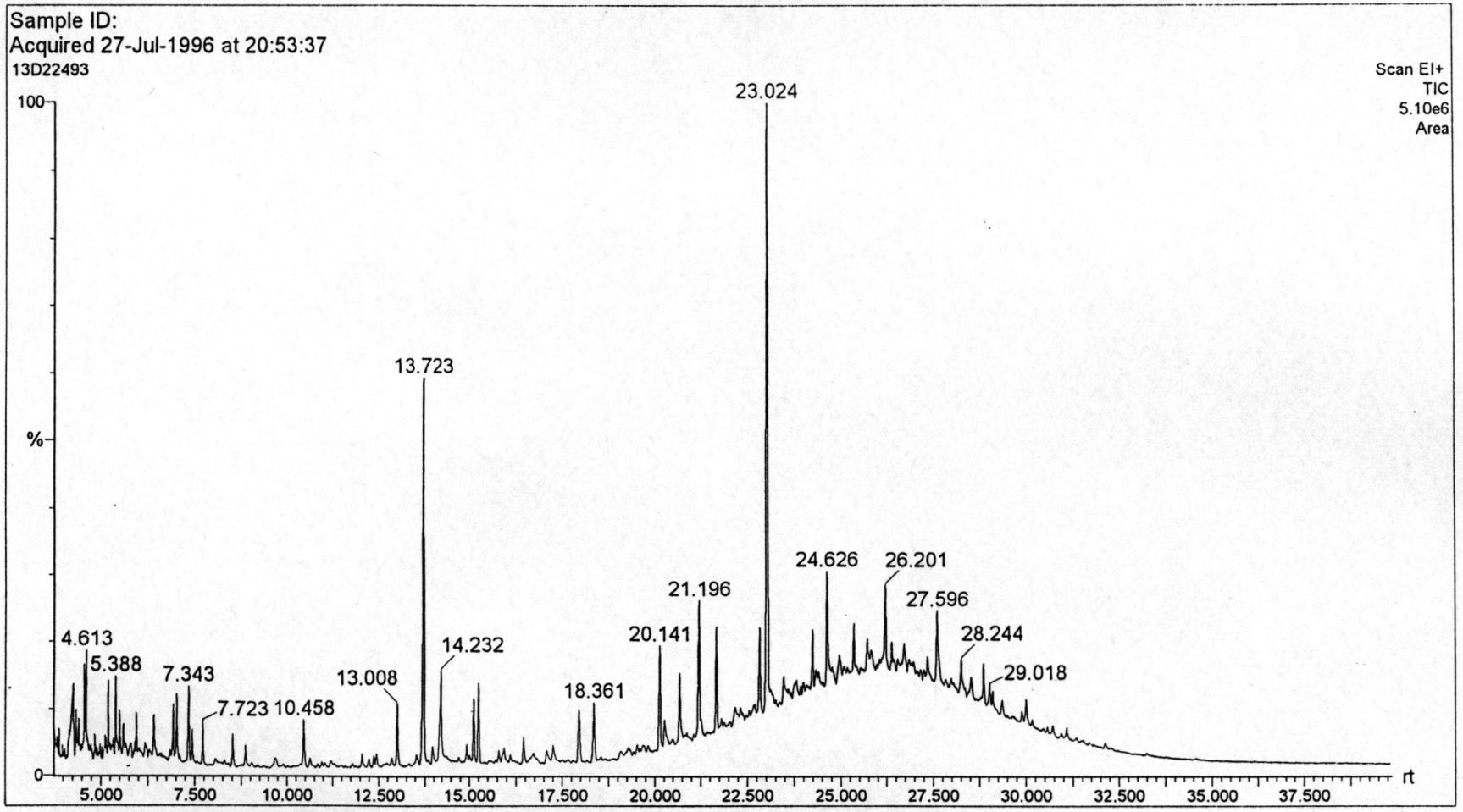


Figure C-3 Chromatogram of Nat.Stat.Off. Samples

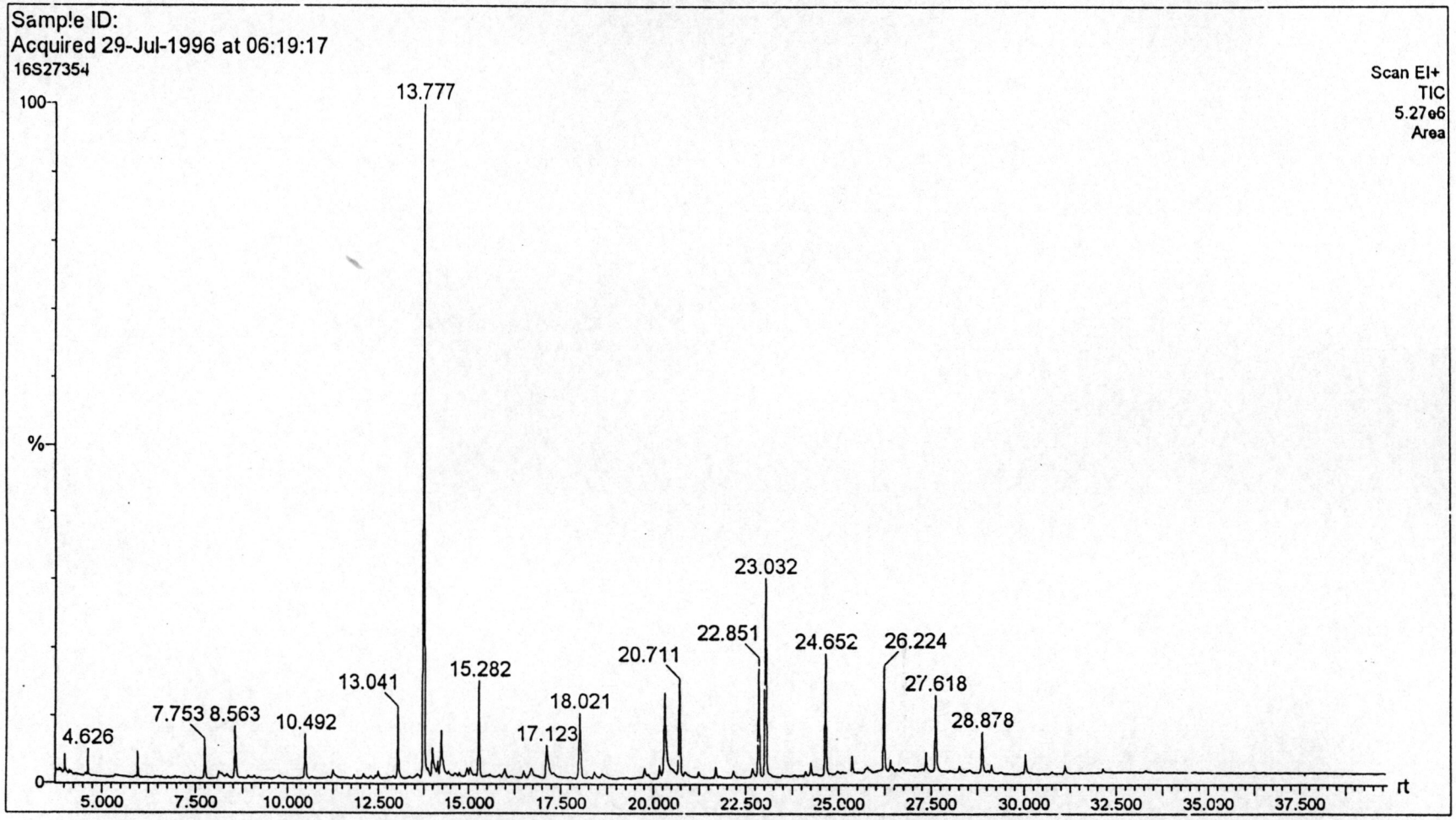


Figure C-4 Chromatogram of Bansomdej Samples

APPENDIX D

PNA in Airborne Particulate Samples

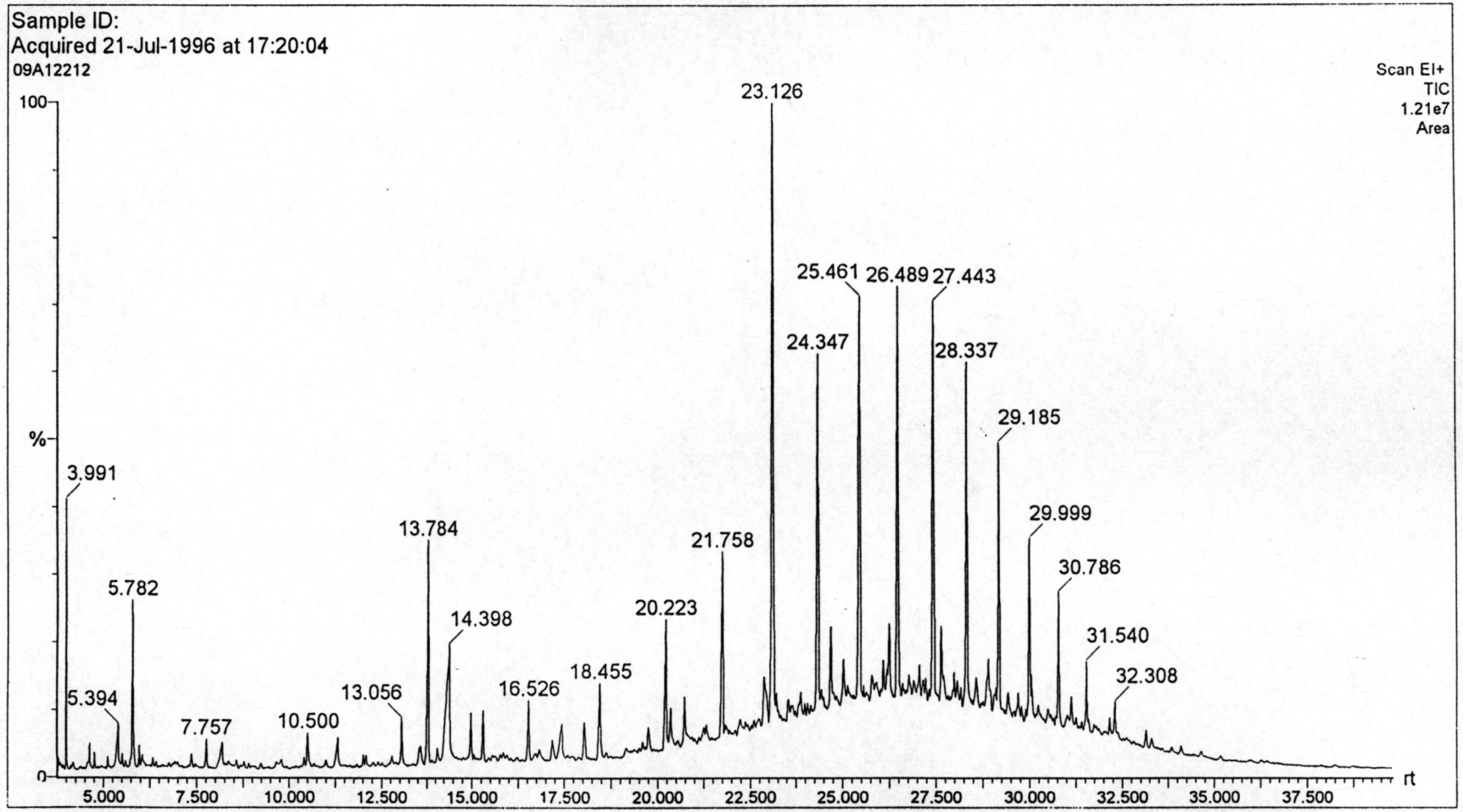


Figure D-1 Gas Chromatogram of Hydrocarbons Fraction of Airborne Particulate Sample

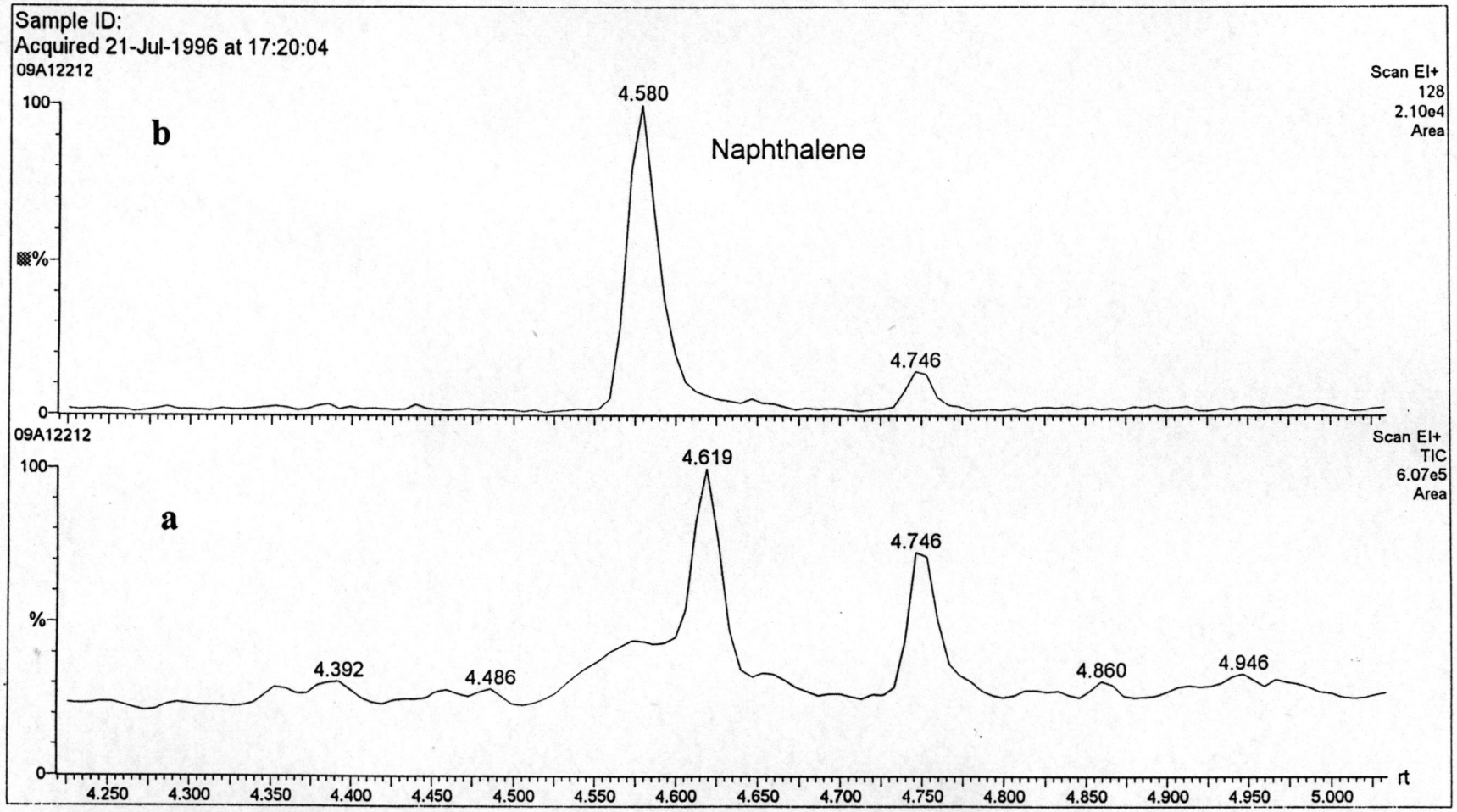
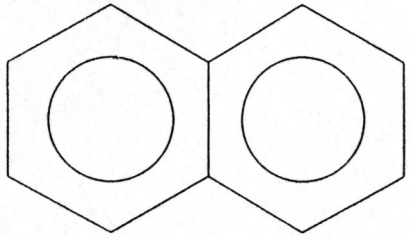
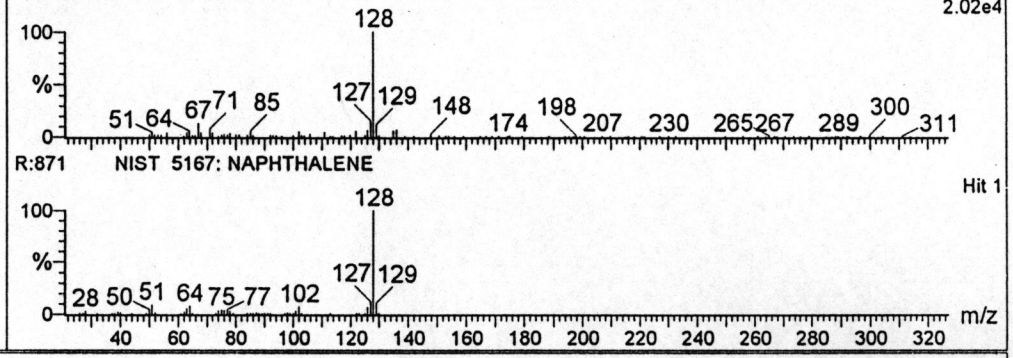


Figure D-2 (a) Gas Chromatogram of Naphthalene Fraction and (b) Selected Ion Chromatograms of *m/z* 128

Compound Name: NAPHTHALENE
Synonym: Albocarbon
Molecular Weight: 128



Sample ID:
Acquired 21-Jul-1996 at 17:20:04
Library: NIST
Forward Fit: 623, Reverse Fit: 871
09A12212 124 (4.580) Rf (6,3.000)



Data File: 09A12212
Sample ID:
Acquired 17:20:04 at 17:20:04

Hit	Compound Name	Formula	M.W.	for	REV	CAS	Library	Entry
1	NAPHTHALENE	C10H8	128	623	871	91-20-3	NIST	5167
2	1H-INDENE, 1-METHYLENE-	C10H8	128	555	870	2471-84-3	NIST	5168
3	BICYCLO 4.4.1 UNDECA-1,3,5,7,9-PENTAEN-11-O	C11H8O	156	575	868	36628-80-5	NIST	11595
4	AZULENE	C10H8	128	580	808	275-51-4	NIST	5166
5	4.2.2 PROPELLA-2,4,7,9-TETRAENE	C10H8	128	550	780	88090-34-0	NIST	5169
6	2,6-DIFLUOROTOLUENE	C7H6F2	128	399	633	443-84-5	NIST	4902
7	CYCLOPROP A INDENE, 6-BROMO-1,1A,6,6A-TETRA	C10H9Br	208	432	620	55780-41-1	NIST	24774
8	1,4-METHANONAPHTHALEN-9-OL, 1,4-DIHYDRO-	C11H10O	158	370	560	4796-33-2	NIST	12092
9	2,4-DIFLUOROTOLUENE	C7H6F2	128	406	559	452-76-6	NIST	4901
10	1-(1-CYANOCYCLOPENTYL)PYRROLIDINE	C10H16N2	164	79	534	0-00-0	NIST	13486
11	2H-THIETE, 2-METHYLENE-4-PHENYL-, 1,1-DIOXI	C10H8O2S	192	369	527	16793-43-4	NIST	20649
12	CYCLOHEXANE, 1,1'-(1,3-BUTADIENE-1,4-DIYL)B	C16H26	218	134	507	55712-53-3	NIST	27274
13	5-(2-NAPHTHYLSULPHONYL)DIHYDRO-1,3,5-DIOXAZ	C13H13O4NS	279	289	492	56221-13-7	NIST	39272
14	1,9-DIOXA-4,12-DIAZADISPIRO 4.2.4.2 TETRADE	C14H26O2N2	254	330	490	0-00-0	NIST	34701
15	2-NAPHTHALENEMETHANOL, .ALPHA.-METHYL-, (.+	C12H12O	172	326	484	40295-80-5	NIST	15870
16	2-NAPHTHALENEMETHANOL	C11H10O	158	326	478	1592-38-7	NIST	12088
17	1-NAPHTHALENEMETHANOL	C11H10O	158	333	476	4780-79-4	NIST	12097

Figure D-3 Comparison of Mass Spectrum of Naphthalene with Mass Spectrum in NIST Library

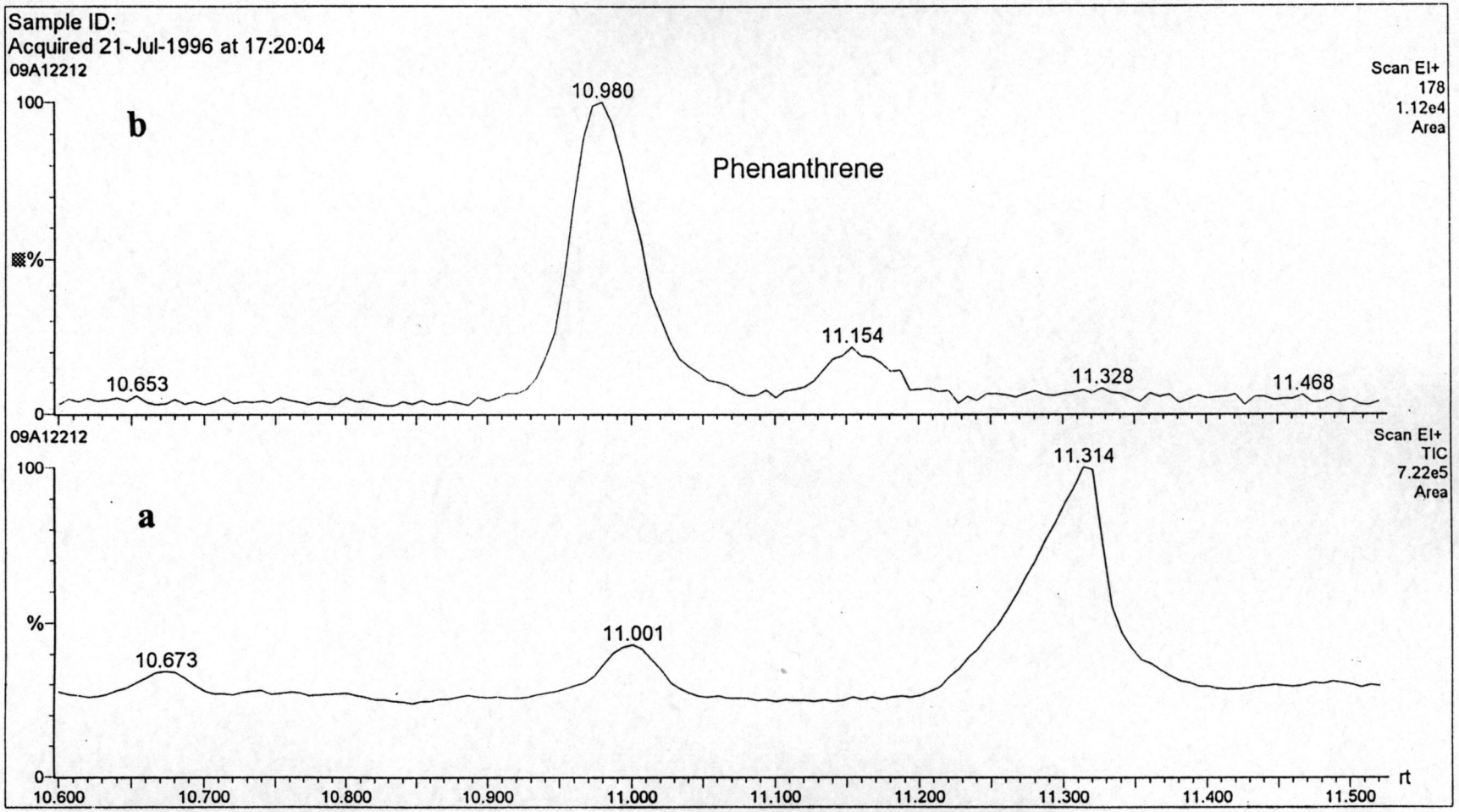
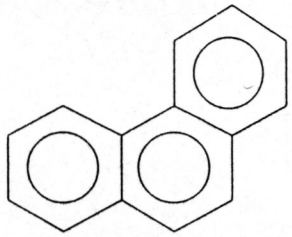
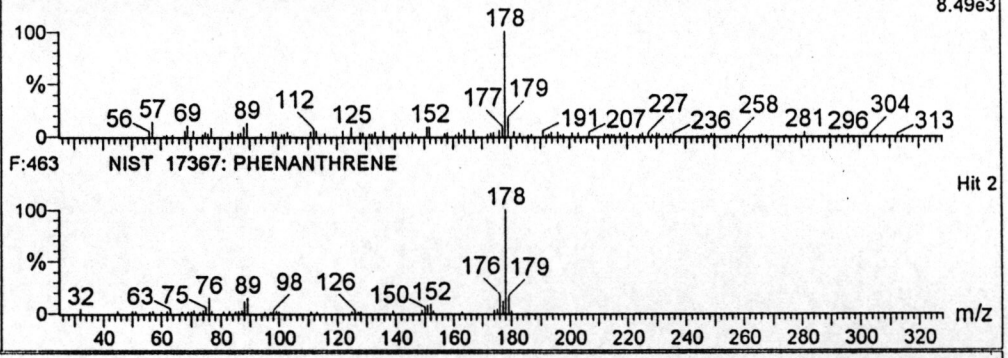


Figure D-4 (a) Gas Chromatogram of Phenanthrene Fraction and (b) Selected Ion Chromatograms of *m/z* 178

Compound Name: PHENANTHRENE
Synonym: Phenanthren
Molecular Weight: 178



Sample ID:
Acquired 21-Jul-1996 at 17:20:04
Library: NIST
Forward Fit: 463, Reverse Fit: 739
09A12212 1083 (10.980) Rf (6,3.000)



Data File: 09A12212
Sample ID:
Acquired 17:20:04 at 17:20:04

Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	2-CYCLOPROPEN-1-ONE, 2,3-DIPHENYL-	C15H10O	206	466	711	886-38-4	NIST	24436
2	PHENANTHRENE	C14H10	178	463	674	85-01-8	NIST	17367
3	ANTHRACENE	C14H10	178	450	711	120-12-7	NIST	17368
4	7,8-DIPHENYLBICYCLO 4.2.1 NONA-2,4,7-TRIENE	C21H18	270	400	659	54049-09-1	NIST	37860
5	9H-FLUORENE, 9-METHYLENE-	C14H10	178	393	794	4425-82-5	NIST	17369
6	9,10-ETHANOANTHRACENE, 9,10-DIHYDRO-	C16H14	206	392	739	5675-64-9	NIST	24479
7	DIPHENYLETHYNE	C14H10	178	390	622	501-65-5	NIST	17370
8	BENZENE, 1,1'-(1-NITRO-1,2-ETHENEDIYL)BIS-	C14H11O2N	225	349	575	1215-07-2	NIST	28907
9	5H-DIBENZO A,D CYCLOHEPTEN-5-ONE	C15H10O	206	345	550	2222-33-5	NIST	24438
10	BENZENE, 1,1'-(1-NITRO-1,2-ETHENEDIYL)BIS-,	C14H11O2N	225	341	612	18315-83-8	NIST	28906
11	BENZENE, 1-NITRO-3-(2-PHENYLETHENYL)-	C14H11O2N	225	322	524	4714-26-5	NIST	28904
12	BENZENE, 1,1'-(1-CHLORO-1,2-ETHENEDIYL)BIS-	C14H11Cl	214	291	476	948-98-1	NIST	26376
13	BENZENE, 1-NITRO-4-(2-PHENYLETHENYL)-	C14H11O2N	225	286	510	4003-94-5	NIST	28910
14	PHENANTHRIDINE	C13H9N	179	277	434	229-87-8	NIST	17511
15	P-PHENYLBENZONITRILE	C13H9N	179	275	446	2920-38-9	NIST	17510
16	ANTHRACENE, 9,10-DIHYDRO-	C14H12	180	274	460	613-31-0	NIST	17960
17	(Z)-STILBENE	C14H12	180	273	430	645-49-8	NIST	17955

Figure D-5 Comparison of Mass Spectrum of Phenanthrene with Mass Spectrum in NIST Library

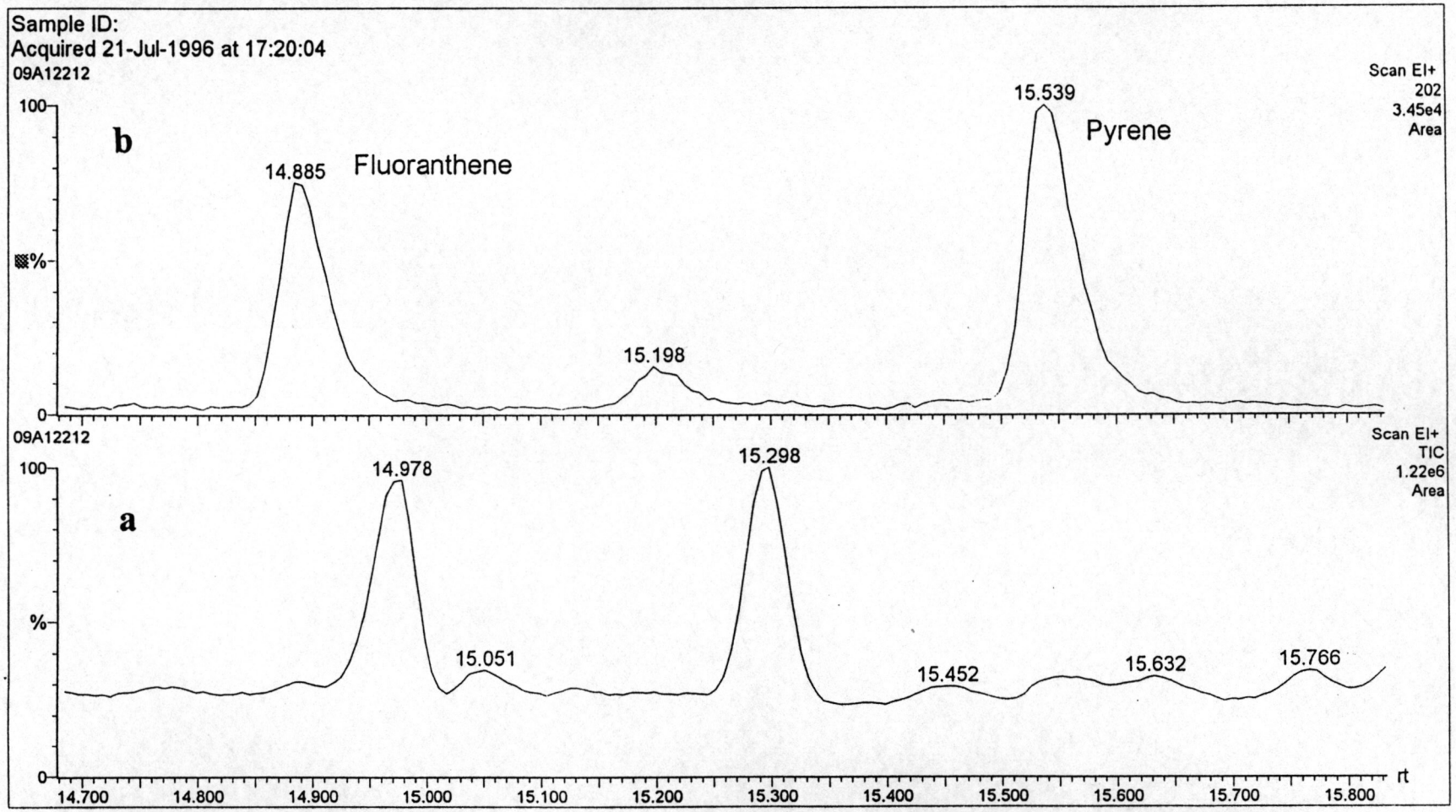
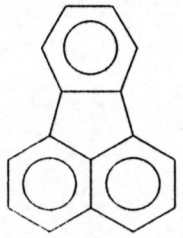
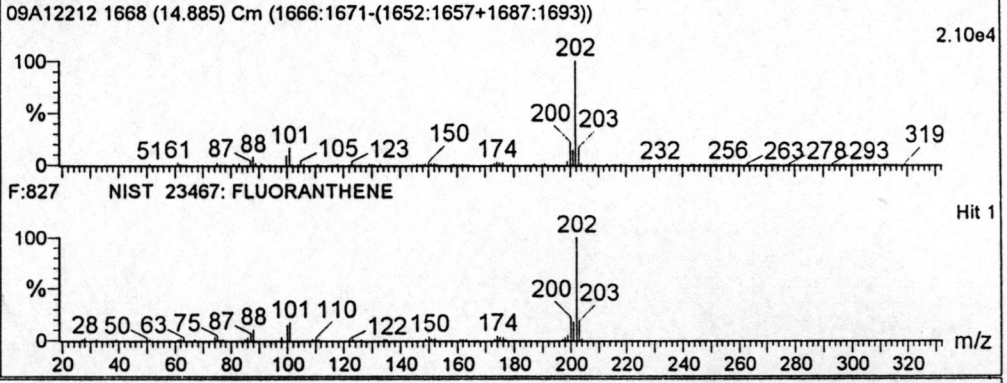


Figure D-6 (a) Gas Chromatogram of Fluoranthene and Pyrene Fraction and (b) Selected Ion Chromatograms of *m/z* 202

Compound Name: FLUORANTHENE
Synonym: Benzene, 1,2-(1,8-naphthalenediyl)-
Molecular Weight: 202



Sample ID:
Acquired 21-Jul-1996 at 17:20:04
Library: NIST
Forward Fit: 827, Reverse Fit: 899

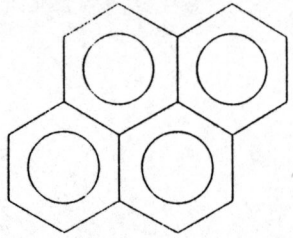


Data File: 09A12212
Sample ID:
Acquired 17:20:04 at 17:20:04

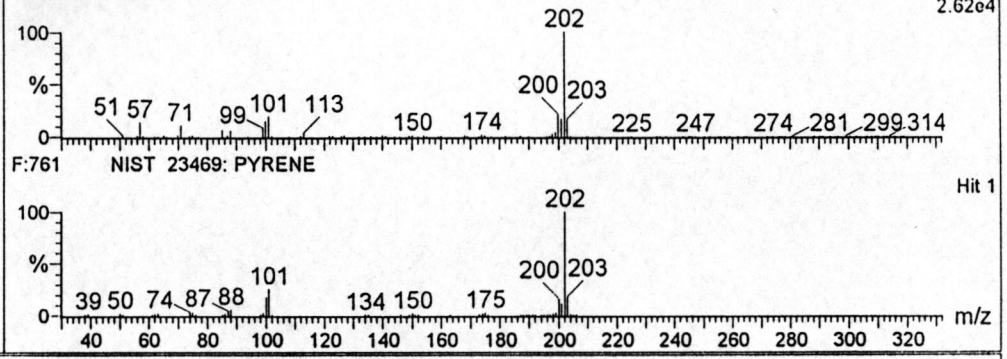
Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	FLUORANTHENE	C16H10	202	827	897	206-44-0	NIST	23467
2	PYRENE	C16H10	202	826	899	129-00-0	NIST	23469
3	BENZENE, 1,1'-(1,3-BUTADIYNE-1,4-DIYL)BIS-	C16H10	202	742	812	886-66-8	NIST	23468
4	ANTHRACENE, 9-ETHENYL-	C16H12	204	569	624	2444-68-0	NIST	23992
5	7H-BENZ DE ANTHRACEN-7-ONE	C17H10O	230	497	541	82-05-3	NIST	30040

Figure D-7 Comparison of Mass Spectrum of Fluoranthene with Mass Spectrum in NIST Library

Compound Name: PYRENE
Synonym: á-Pyrene
Molecular Weight: 202



Sample ID:
Acquired 21-Jul-1996 at 17:20:04
Library: NIST
Forward Fit: 761, Reverse Fit: 904
09A12212 1768 (15.552) Cm (1763:1770-(1748:1753+1792:1796))



Data File: 09A12212
Sample ID:
Acquired 17:20:04 at 17:20:04

Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	PYRENE	C16H10	202	761	904	129-00-0	NIST	23469
2	FLUORANTHENE	C16H10	202	732	893	206-44-0	NIST	23467
3	BENZENE, 1,1'-(1,3-BUTADIYNE-1,4-DIYL)BIS-	C16H10	202	664	784	886-66-8	NIST	23468
4	ANTHRACENE, 9-(2-NITROETHENYL)-	C16H11O2N	249	644	806	58349-77-2	NIST	33709
5	2,3-DIHYDROFLUORANTHENE	C16H12	204	605	797	30339-87-8	NIST	23987
6	3,10B-DIHYDROFLUORANTHENE	C16H12	204	592	800	37980-07-7	NIST	23993
7	1,9-DIHYDROPYRENE	C16H12	204	543	714	0-00-0	NIST	23986
8	PYRENE, 4,5-DIHYDRO-	C16H12	204	507	667	6628-98-4	NIST	23991
9	ANTHRACENE, 9-ETHENYL-	C16H12	204	489	595	2444-68-0	NIST	23992
10	7H-BENZ DE ANTHRACEN-7-ONE	C17H10O	230	459	556	82-05-3	NIST	30040
11	1-PYRENE-CARBOXALDEHYDE	C17H10O	230	446	527	3029-19-4	NIST	30041
12	1H-INDENE, 1-(PHENYLMETHYLENE)-	C16H12	204	420	575	5394-86-5	NIST	23994
13	NAPHTHALENE, 1-PHENYL-	C16H12	204	413	496	605-02-7	NIST	23990
14	5,12-NAPHTHACENEDIONE	C18H10O2	258	381	466	1090-13-7	NIST	35591
15	4-BROMO-1,2-(METHYLENEDIOXY)BENZENE	C7H5O2Br	200	369	506	2635-13-4	NIST	22736
16	BENZ(A)ANTHRACENE-7,12-DIONE	C18H10O2	258	364	439	2498-66-0	NIST	35592
17	1,2,4,5-TETRAZINE, 1,4-DIBUTYLHEXAHYDRO-	C10H24N4	200	213	514	35035-70-2	NIST	22868

Figure D-8 Comparison of Mass Spectrum of Pyrene with Mass Spectrum in NIST Library

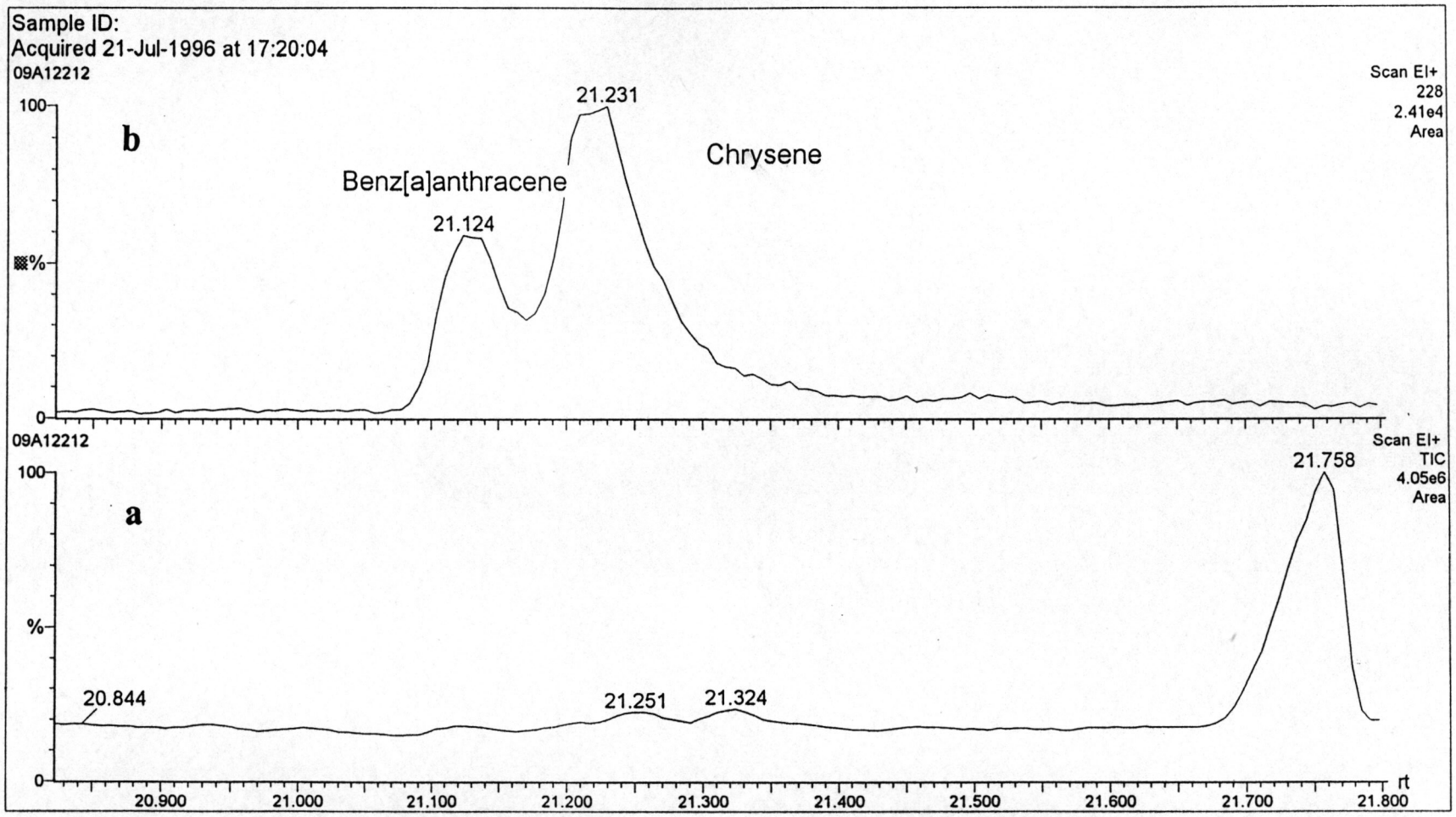
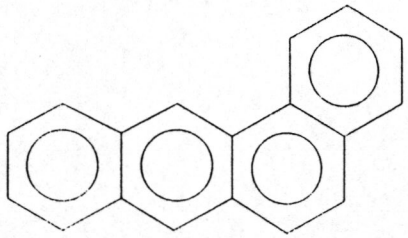
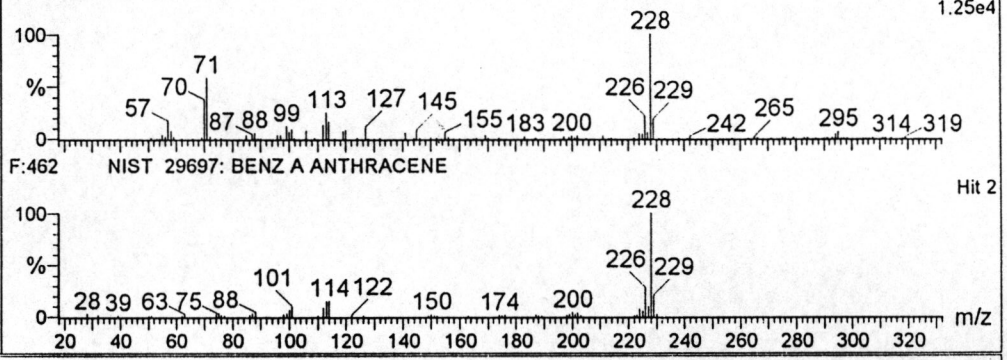


Figure D-9 (a) Gas Chromatogram of Benzo[a]anthracene and Chrysene Fraction and (b) Selected Ion Chromatograms of *m/z* 228

Compound Name: BENZ A ANTHRACENE
Synonym: Benzanthracene
Molecular Weight: 228



Sample ID:
Acquired 21-Jul-1996 at 17:20:04
Library: NIST
Forward Fit: 462, Reverse Fit: 834
09A12212 2603 (21.124) Cm (2602:2606-(2586:2589+2650:2653))

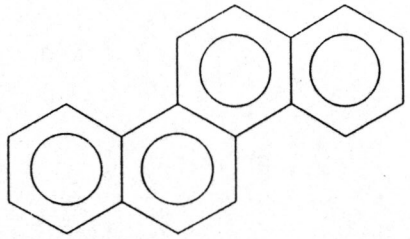


Data File: 09A12212
Sample ID:
Acquired 17:20:04 at 17:20:04

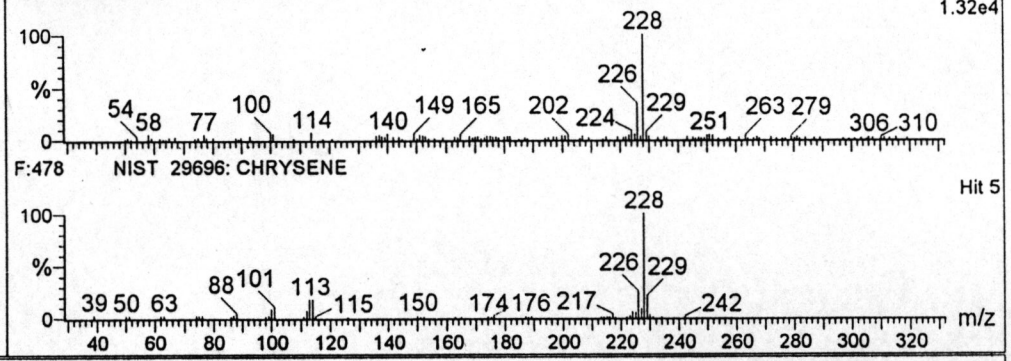
Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	TRIPHENYLENE	C18H12	228	541	746	217-59-4	NIST	29698
2	BENZ A ANTHRACENE	C18H12	228	462	864	56-55-3	NIST	29697
3	CHRYSENE	C18H12	228	437	834	218-01-9	NIST	29696

Figure D-10 Comparison of Mass Spectrum of Benzo[a]anthracene with Mass Spectrum in NIST Library

Compound Name: CHRYSENE
Synonym: Benzo[a]phenanthrene
Molecular Weight: 228



Sample ID:
Acquired 21-Jul-1996 at 17:20:04
Library: NIST
Forward Fit: 478, Reverse Fit: 706
09A12212 2618 (21.224) Rf (6,3.000)



Data File: 09A12212
Sample ID:
Acquired 17:20:04 at 17:20:04

Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	BENZ A ANTHRACENE	C18H12	228	533	744	56-55-3	NIST	29697
2	3,4-DIHYDROCYCLOPENTA(CD)PYRENE (ACEPYRENE)	C18H12	228	512	796	25732-74-5	NIST	29695
3	TRIPHENYLENE	C18H12	228	508	735	217-59-4	NIST	29698
4	BENZO C PHENANTHRENE	C18H12	228	481	706	195-19-7	NIST	29694
5	CHRYSENE	C18H12	228	478	707	218-01-9	NIST	29696
6	1,1,3,3-TETRACHLORO-1,3-DISILACYCLOBUTANE	C2H4Cl4Si2	224	333	617	2146-97-6	NIST	28448

Figure D-11 Comparison of Mass Spectrum of Chrysene with Mass Spectrum in NIST Library

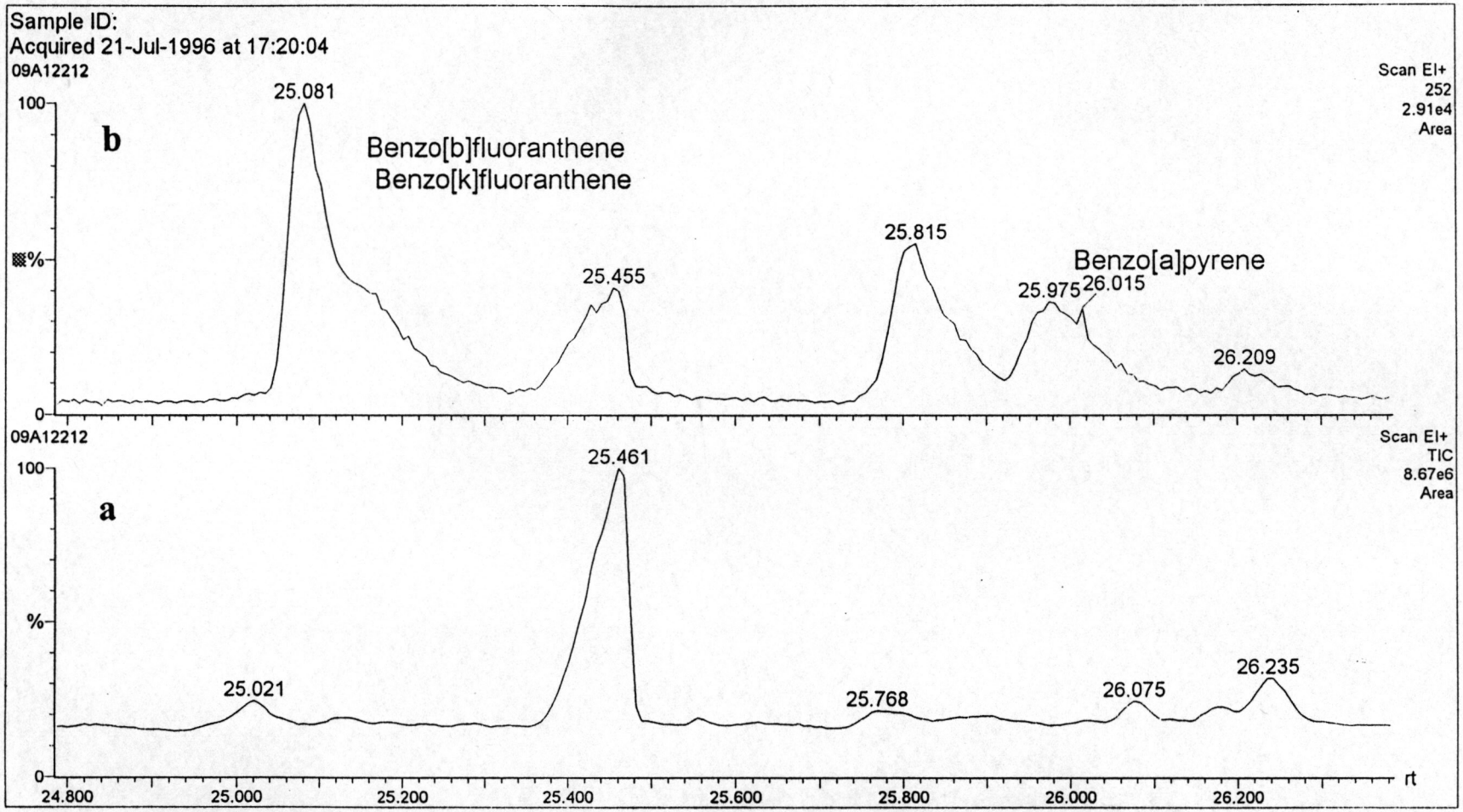
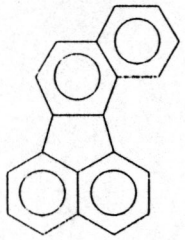
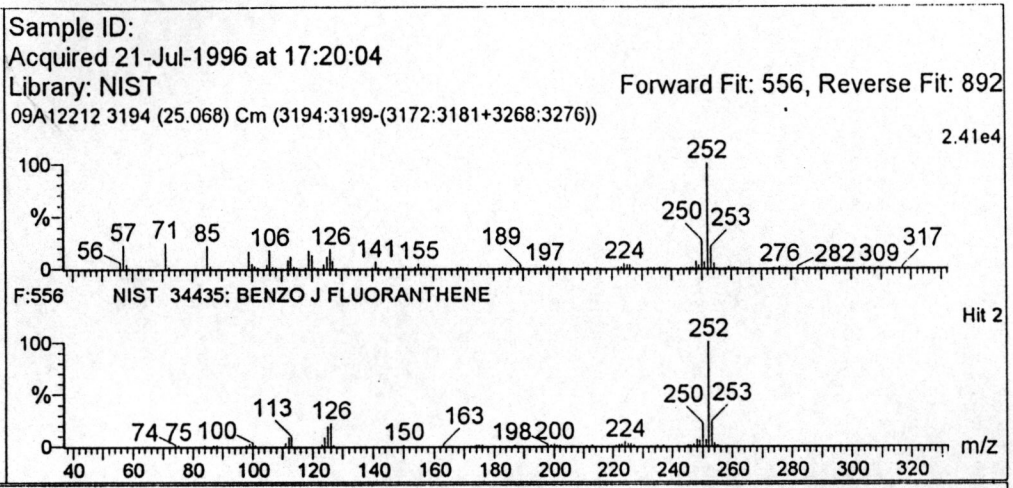


Figure D-12 (a) Gas Chromatogram of Benzo[b] fluoranthene, Benzo[k] fluoranthene and Benzo[a]pyrene Fraction and (b) Selected Ion Chromatograms of *m/z* 252

Compound Name: BENZO J FLUORANTHENE
Synonym: Benzo-10,11-fluoranthene
Molecular Weight: 252



Sample ID:
Acquired 21-Jul-1996 at 17:20:04
Library: NIST
Forward Fit: 556, Reverse Fit: 892

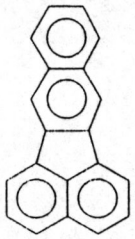


Data File: 09A12212
Sample ID:
Acquired 17:20:04 at 17:20:04

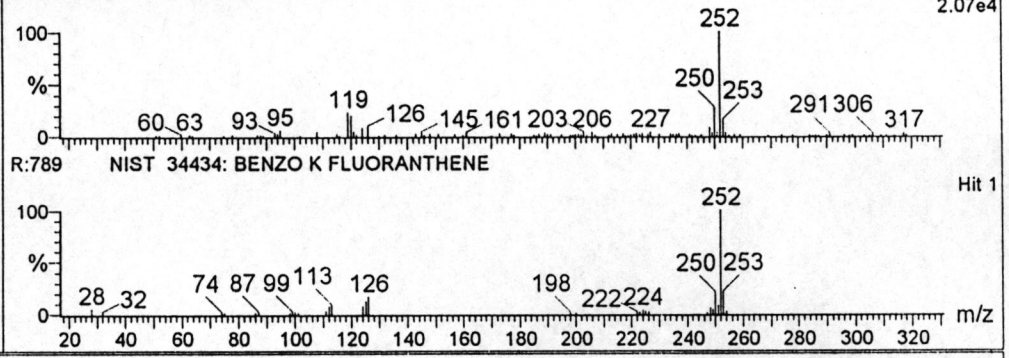
Hit	Compound Name	Formula	M.W.	FOR	rev	CAS	Library	Entry
1	BENZO K FLUORANTHENE	C20H12	252	563	927	207-08-9	NIST	34434
2	BENZO J FLUORANTHENE	C20H12	252	556	892	205-82-3	NIST	34435
3	BENZO E PYRENE	C20H12	252	555	834	192-97-2	NIST	34433
4	BENZ E ACEPHENANTHRYLENE	C20H12	252	553	887	205-99-2	NIST	34432
5	PERYLENE	C20H12	252	552	861	198-55-0	NIST	34430
6	BENZO A PYRENE	C20H12	252	517	758	50-32-8	NIST	34431
7	9H-FLUORENE-9-METHANOL, .ALPHA.-PHENYL-, AC	C22H18O2	314	457	610	63839-89-4	NIST	44891
8	BENZO A PYRENE, 4,5-DIHYDRO-	C20H14	254	449	685	57652-66-1	NIST	34832
9	1H-INDENE, 1,1'-(1,2-ETHANEDIYLIDENE)BIS-	C20H14	254	444	784	72088-04-1	NIST	34834
10	4,6'-BIAZULENYL	C20H14	254	443	755	94154-49-1	NIST	34835
11	4,8'-BIAZULENYL	C20H14	254	441	752	0-00-0	NIST	34825
12	9H-FLUORENE, 9-(PHENYLMETHYLENE)-	C20H14	254	435	640	1836-87-9	NIST	34828
13	1,1'-BINAPHTHALENE	C20H14	254	427	670	604-53-5	NIST	34830
14	9-(M-NITROBENZYLIDENE)FLUORENE	C20H13O2N	299	424	650	4421-51-6	NIST	42643
15	9-(P-NITROBENZYLIDENE)FLUORENE	C20H13O2N	299	414	635	6954-71-8	NIST	42646
16	ANTHRACENE, 9-PHENYL-	C20H14	254	408	637	602-55-1	NIST	34833
17	1,2'-BINAPHTHALENE	C20H14	254	389	597	4325-74-0	NIST	34829

Figure D-13 Comparison of Mass Spectrum of Benzo[b] fluoranthene with Mass Spectrum in NIST Library

Compound Name: BENZO K FLUORANTHENE
Synonym: Dibenzo[b,jk]fluorene
Molecular Weight: 252



Sample ID:
Acquired 21-Jul-1996 at 17:20:04
Library: NIST
Forward Fit: 496, Reverse Fit: 789
09A12212 3196 (25.081) Rf (6,3.000)

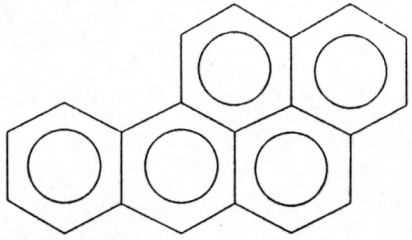


Data File: 09A12212
Sample ID:
Acquired 17:20:04 at 17:20:04

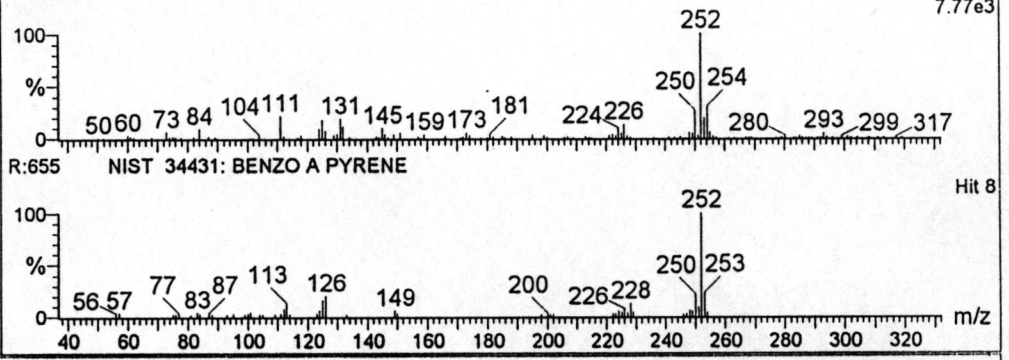
Hit	Compound Name	Formula	M.W.	for	REV	CAS	Library	Entry
1	BENZO K FLUORANTHENE	C20H12	252	464	789	207-08-9	NIST	34434
2	BENZ E ACEPHENANTHRYLENE	C20H12	252	488	754	205-99-2	NIST	34432
3	BENZO E PYRENE	C20H12	252	476	750	192-97-2	NIST	34433
4	BENZO J FLUORANTHENE	C20H12	252	474	741	205-82-3	NIST	34435
5	PERYLENE	C20H12	252	496	711	198-55-0	NIST	34430
6	1,2-DIHYDROBENZO B FLUORANTHENE	C20H14	254	372	701	0-00-0	NIST	34824
7	BENZO A PYRENE	C20H12	252	397	631	50-32-8	NIST	34431
8	BENZO A PYRENE, 4,5-DIHYDRO-	C20H14	254	361	560	57652-66-1	NIST	34832
9	1H-INDENE, 1,1'-(1,2-ETHANEDIYLIDENE)BIS-	C20H14	254	297	509	72088-04-1	NIST	34834
10	9H-FLUORENE, 9-(PHENYLMETHYLENE)-	C20H14	254	254	403	1836-87-9	NIST	34828

Figure D-14 Comparison of Mass Spectrum of Benzo[k] fluoranthene with Mass Spectrum in NIST Library

Compound Name: BENZO A PYRENE
Synonym: Benz[a]pyrene
Molecular Weight: 252



Sample ID:
Acquired 21-Jul-1996 at 17:20:04
Library: NIST
Forward Fit: 419, Reverse Fit: 655
09A12212 3335 (26.008) Cm (3328:3335-(3285:3290+3350:3357))



Data File: 09A12212
Sample ID:
Acquired 17:20:04 at 17:20:04

Hit	Compound Name	Formula	M.W.	for	REV	CAS	Library	Entry
1	1,2-DIHYDROBENZO B FLUORANTHENE	C20H14	254	468	860	0-00-0	NIST	34824
2	4,5-DIHYDROBENZO E PYRENE	C20H14	254	546	771	95676-42-9	NIST	34826
3	4,8'-BIAZULENYL	C20H14	254	416	756	0-00-0	NIST	34825
4	4,6'-BIAZULENYL	C20H14	254	409	742	94154-49-1	NIST	34835
5	BENZO A PYRENE, 4,5-DIHYDRO-	C20H14	254	515	741	57652-66-1	NIST	34832
6	1H-INDENE, 1,1'-(1,2-ETHANEDIYLIDENE)BIS-	C20H14	254	389	701	72088-04-1	NIST	34834
7	ANTHRACENE, 9-PHENYL-	C20H14	254	435	657	602-55-1	NIST	34833
8	BENZO A PYRENE	C20H12	252	476	655	50-32-8	NIST	34431
9	1,1'-BINAPHTHALENE	C20H14	254	425	642	604-53-5	NIST	34830
10	1,2'-BINAPHTHALENE	C20H14	254	462	635	4325-74-0	NIST	34829
11	9-(M-NITROBENZYLIDENE)FLUORENE	C20H13O2N	299	419	625	4421-51-6	NIST	42643
12	9-(P-NITROBENZYLIDENE)FLUORENE	C20H13O2N	299	401	597	6954-71-8	NIST	42646
13	9H-FLUORENE-9-METHANOL, .ALPHA.-PHENYL-, AC	C22H18O2	314	361	566	63839-89-4	NIST	44891
14	9,10 1',2' -BENZENOANTHRACENE, 9,10-DIHYDRO	C20H14	254	389	561	477-75-8	NIST	34827
15	2,2'-BINAPHTHALENE	C20H14	254	364	548	612-78-2	NIST	34831
16	9H-FLUORENE, 9-(PHENYLMETHYLENE)-	C20H14	254	367	547	1836-87-9	NIST	34828
17	9-ANTHRACENECARBOXALDEHYDE, 10-PHENYL-	C21H14O	282	298	456	54458-81-0	NIST	39870

Figure D-15 Comparison of Mass Spectrum of Benzo[a] pyrene with Mass Spectrum in NIST Library

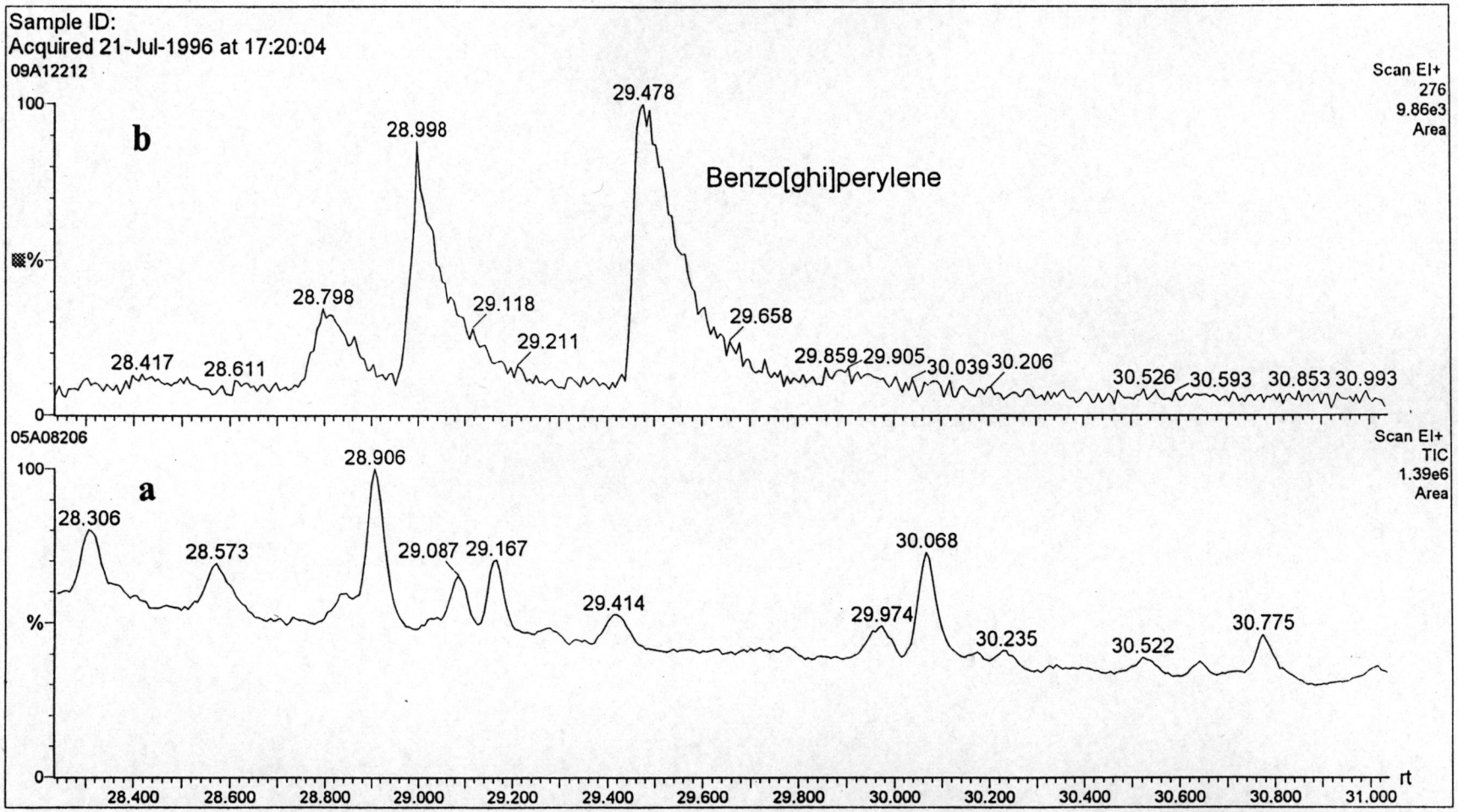
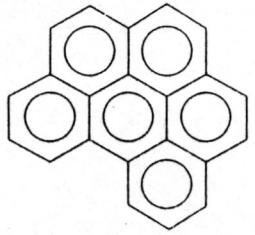
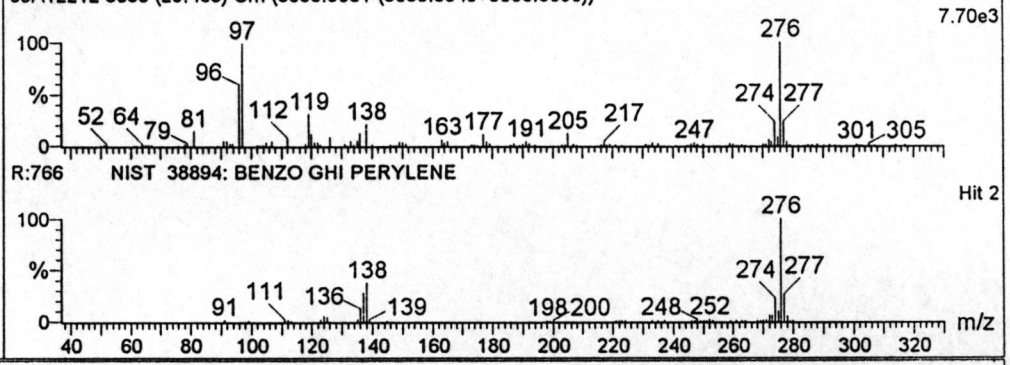


Figure D-16 (a) Gas Chromatogram of Benzo[ghi]perylene Fraction and (b) Selected Ion Chromatograms of *m/z* 276

Compound Name: BENZO GHI PERYLENE
Synonym: Benzo-1,12-perylene
Molecular Weight: 276



Sample ID:
Acquired 21-Jul-1996 at 17:20:04
Library: NIST
Forward Fit: 329, Reverse Fit: 766



Data File: 09A12212
Sample ID:
Acquired 17:20:04 at 17:20:04

Hit	Compound Name	Formula	M.W.	for	REV	CAS	Library	Entry
1	INDENO 1,2,3-CD PYRENE	C22H12	276	328	823	193-39-5	NIST	38896
2	BENZO GHI PERYLENE	C22H12	276	333	766	191-24-2	NIST	38894
3	DIBENZO DEF,MNO CHRYSENE	C22H12	276	329	730	191-26-4	NIST	38895
4	1,12-BENZPERYLENE	C22H12	276	307	704	0-00-0	NIST	38893
5	CYCLOPROPANECARBONITRILE, 2- P-(DIMETHYLAMI	C19H20N2	276	213	560	32589-51-8	NIST	38875
6	2-PHENYL-4- (2-PROPYN-1-YL)THIO QUINAZOLINE	C17H12N2S	276	159	519	0-00-0	NIST	38839
7	RHODIUM, (1,2,5,6-.ETA.)-1,5-CYCLOOCTADIEN	C13H17Rh	276	140	388	32610-45-0	NIST	38765
8	BENZO B CHRYSENE	C22H14	278	226	372	214-17-5	NIST	39241
9	2-METHOXY-5-AMINO-4,6-DIPHENYLPYRIMIDINE	C17H15ON3	277	232	363	76891-83-3	NIST	38963
10	1,2:7,8-DIBENZPHENANTHRENE	C22H14	278	148	313	0-00-0	NIST	39237
11	DIBENZ A,J ANTHRACENE	C22H14	278	94	284	224-41-9	NIST	39242
12	BENZO A NAPHTHACENE	C22H14	278	85	269	226-88-0	NIST	39240
13	DIBENZ A,H ANTHRACENE	C22H14	278	153	268	53-70-3	NIST	39243
14	PYRIDINITRIL	C13H5N3Cl2	273	114	267	1086-02-8	NIST	38258
15	BENZO B TRIPHENYLENE	C22H14	278	179	248	215-58-7	NIST	39238
16	GINGEROL	C17H26O4	294	91	234	23513-14-6	NIST	41778
17	CYCLOHEXENE, 1-METHYL-3-(1-METHYLETHYL)-	C10H18	138	64	150	13828-31-4	NIST	7104

Figure D-17 Comparison of Mass Spectrum of Benzo[ghi]perylene with Mass Spectrum in NIST Library

APPENDIX E

Data from GC/MS Analysis

Table E-1 The amount of PNA (ng/m^3),TSP (mg/m^3) Concentration, Air Volume (m^3) in each Sample for BangYeeKhan Area.

No.	SAMPLE	Air Vol.	TSP	Phe	Flu	Py	TotalPAH
1	01A02201	2190.79	0.3355	0.0039	0.0031	0.0126	0.0196
2	02A05202	2023.30	0.3916	0.0038	0.0066	0.0199	0.0303
3	03A06204	1843.55	0.5005	0.0047	0.0087	0.0279	0.0412
4	04A07205	2235.82	0.3468	0.0034	0.0069	0.0201	0.0304
5	05A08206	1823.93	0.3999	0.0045	0.0073	0.0189	0.0307
6	06A09208	1838.20	0.4263	0.0004	0.0005	0.0005	0.0013
7	07A10209	975.23	0.1496	0.0016	0.0026	0.0031	0.0072
8	08A11210	2079.93	0.1945	0.0019	0.0031	0.0054	0.0103
9	09A12212	2067.62	0.9253	0.0049	0.0088	0.0225	0.0361
10	10A13213	2102.91	0.3728	0.0019	0.0029	0.0060	0.0108
11	11A14215	2296.59	0.2134	0.0008	0.0012	0.0016	0.0036
12	12A16216	2272.56	0.1484	0.0005	0.0006	nd	0.0011
13	13A17217	2344.51	0.1225	0.0004	0.0006	0.0005	0.0015
14	14A19219	2173.68	0.2176	0.0019	0.0028	0.0082	0.0128
15	15A20220	2071.21	0.2872	0.0021	0.0045	0.0146	0.0213

Table E-2 The amouths of PNA (ng/m^3),TSP (mg/m^3) Concentration, Air Volume (m^3) in each Sample for Pratuman Area

No.	SAMPLE	Air Vol.	TSP	Phe	Flu	Py	TotalPAH
1	01B21222	2027.81	0.7208	0.0073	0.0083	0.0233	**0.0390**
2	02B22223	1906.59	0.8794	0.0073	0.0108	0.0318	**0.0499**
3	03B23224	1807.30	0.8297	0.0108	0.0118	0.0346	**0.0573**
4	04B24225	1909.00	0.6308	0.0044	0.0047	0.0130	**0.0221**
5	05B25226	2057.28	0.4499	0.0043	0.0059	0.0160	**0.0262**
6	06B26228	2045.31	0.4796	0.0073	0.0085	0.0245	**0.0403**
7	07B27230	2043.57	0.4392	0.0064	0.0073	0.0217	**0.0354**
8	08B28231	1661.23	0.4414	0.0061	0.0053	0.0132	**0.0247**
9	09B29232	1879.53	0.2620	0.0061	0.0067	0.0172	**0.0300**
10	10B01334	1831.20	0.5269	0.0072	0.0083	0.0228	**0.0383**
11	11B02336	1836.64	0.6012	0.0083	0.0096	0.0300	**0.0479**
12	12B03338	1857.74	0.6530	0.0105	0.0189	0.0623	**0.0918**
13	13B04339	1982.11	0.6461	0.0098	0.0142	0.0478	**0.0717**
14	14B06341	1847.81	0.5219	0.0070	0.0086	0.0227	**0.0383**
15	15B07342	2022.26	0.4798	0.0066	0.0080	0.0233	**0.0380**
16	16B08343	1847.99	0.5450	0.0072	0.0078	0.0212	**0.0362**
17	17B09344	1380.00	0.4830	0.0035	0.0056	0.0157	**0.0248**

Table E-3 The amouths of PNA (ng/m^3),TSP (mg/m^3) Concentration, Air Volume (m^3) in each Sample for Yaowaraj Area

No.	SAMPLE	Air Vol.	TSP	Phe	Flu	Py	TotalPAH
1	01C12345	1613.93	0.4698	0.0041	0.0065	0.0204	0.0310
2	03C20348	1509.56	0.5714	0.0045	0.0050	0.0162	0.0258
3	04C21349	1572.00	0.5448	0.0040	0.0060	0.0188	0.0289
4	05C24351	1711.80	0.4503	0.0025	0.0043	0.0117	0.0185
5	06C25353	1549.92	0.4861	0.0033	0.0038	0.0103	0.0174
6	07C26355	1700.65	0.5206	0.0030	0.0058	0.0203	0.0291
7	08C28356	1535.79	0.642	0.0048	0.0056	0.0140	0.0243
8	09C31357	1642.08	0.4834	0.0041	0.0057	0.0167	0.0265
9	10C01458	1355.34	0.5520	0.0049	0.0099	0.0310	0.0457
10	11C29359	1541.25	0.4936	0.0020	0.0027	0.0065	0.0112
11	12C30360	1429.78	0.5536	0.0027	0.0025	0.0061	0.0114
12	13C02461	983.80	0.6379	0.0034	0.0066	0.0194	0.0293
13	14C22362	1500.18	0.5847	0.0027	0.0025	0.0052	0.0104
14	15C05465	1588.38	0.7674	0.0059	0.0100	0.0358	0.0518
15	16C16367	1343.90	0.4874	0.0012	0.0025	0.0054	0.0092
16	17C18368	1413.71	0.4568	0.0033	nd	nd	0.0033
17	18C19369	1425.89	0.4796	0.0010	0.0012	0.0012	0.0034
18	20C08471	1658.30	0.5684	0.0039	0.0067	0.0185	0.0291

Table E-4 The amouths of PNA (ng/m^3),TSP (mg/m^3) Concentration, Air Volume (m^3) in each Sample for Nat.Stat.Off. Area

No.	SAMPLE	Air Vol.	TSP	Phe	Flu	Py	TotalPAH
1	01D11473	1576.94	0.2396	0.0029	0.0022	0.0042	0.0093
2	02D12475	1847.44	0.1922	nd	0.0026	0.0047	0.0073
3	03D13477	1913.23	0.1687	nd	0.0019	0.0043	0.0063
4	04D14479	1720.46	0.2412	nd	0.0035	0.0081	0.0116
5	05D15481	1911.66	0.1726	nd	0.0023	0.0120	0.0143
6	06D16483	1791.51	0.1637	nd	0.0027	0.0051	0.0077
7	08D18486	1841.41	0.2697	nd	0.0040	0.0113	0.0153
8	09D19487	1761.16	0.1735	0.0033	0.0042	0.0117	0.0192
9	10D20488	1842.58	0.2443	0.0025	0.0028	0.0054	0.0106
10	11D26489	1758.63	0.2023	0.0039	0.0041	0.0125	0.0205
11	12D27491	1814.42	0.1571	0.0033	0.0039	0.0086	0.0159
12	13D22493	1601.78	0.4548	0.0022	0.0028	0.0072	0.0122
13	15D28496	1898.38	0.1916	0.0017	0.0021	0.0046	0.0083

Table E-5 The amouths of PNA (ng/m^3),TSP (mg/m^3) Concentration, Air Volume (m^3) in each Sample for Bansomdej Area

No.	SAMPLE	Air Vol.	TSP	Phe	Flu	Py	TotalPAH
1	01S05203	2085.31	0.2854	0.0019	0.0022	0.0048	0.0090
2	02S08207	1987.85	0.3576	0.0029	0.0037	0.0082	0.0149
3	03S11211	2057.17	0.3264	0.0016	0.0022	0.0044	0.0082
4	04S14214	2116.50	0.2757	0.0014	0.0015	0.0030	0.0060
5	05S17218	2119.56	0.1701	nd	nd	nd	nd
6	06S20221	2194.99	0.1292	0.0022	0.0026	0.0046	0.0093
7	07S23227	2190.77	0.2061	0.0045	0.0034	0.0060	0.0138
8	09S29233	2200.09	0.1916	nd	nd	nd	nd
9	10S01335	2136.09	0.1621	0.0020	0.0017	0.0027	0.0063
10	11S02337	2090.46	0.2000	0.0027	0.0031	0.0060	0.0117
11	12S03340	2241.63	0.2519	0.0042	0.0042	0.0078	0.0162
12	13S18347	2134.63	0.3862	nd	nd	nd	nd
13	14S21350	2119.96	0.2108	nd	nd	nd	nd
14	15S24352	2311.58	0.1218	nd	nd	nd	nd
15	16S27354	2263.85	0.0807	nd	nd	nd	nd
16	17S30363	2240.66	0.1554	nd	nd	nd	nd
17	18S02464	2494.78	0.1595	nd	nd	nd	nd
18	19S05466	2115.07	0.1641	nd	nd	nd	nd
19	20S08472	2140.76	0.1106	nd	nd	nd	nd
20	21S11474	2072.66	0.1822	nd	nd	nd	nd
21	22S12476	1964.75	0.1021	nd	nd	nd	nd
22	23S13478	2150.75	0.0856	nd	nd	nd	nd
23	24S14480	2109.26	0.1057	nd	nd	nd	nd
24	25S15482	2205.16	0.1150	nd	nd	nd	nd
25	26S17485	2195.40	0.1260	nd	nd	nd	nd
26	27S26490	2314.88	0.1039	nd	nd	nd	nd
27	28S20492	2222.72	0.1469	nd	nd	nd	nd
28	29S23494	2180.31	0.1989	nd	nd	nd	nd
29	30S29497	2306.44	0.1151	nd	nd	nd	nd

APPENDIX F

Meteorological Data

Table F-1 Meteorological Data for BangYeeKhan Area during the Study Periods (Feb 2 - Feb 20, 1996)

No.	SAMPLE	MEAN TEMP	R.H	VAPOUR PRESS	RAINFALL	SUNSHINE
		(°C)	(%)	(HECTOPASCAL)	(mm.)	(HR)
1	01A02201	25.5	55	18.9	0	5.4
2	02A05202	26.2	55	19.7	0	7.4
3	03A06204	26.3	55	18.8	0	7.2
4	04A07205	26.0	52	18.1	0	7.1
5	05A08206	25.7	44	15.6	0	7.5
6	06A09208	26.1	42	14.8	0	7.8
7	07A10209	25.3	49	16.8	0	7.8
8	08A11210	24.9	53	17.8	0	7.7
9	09A12212	26.7	49	17.8	0	7.5
10	10A13213	27.3	60	22.2	0	7.5
11	11A14215	27.8	73	28.0	0	7.7
12	12A16216	29.2	74	29.8	0	7.8
13	13A17217	29.6	75	30.1	0	7.8
14	14A19219	26.3	85	29.1	3.9	0.0
15	15A20220	25.5	67	21.1	0	5.1

Table F-2 Meteorological Data for Pratunam Area during the Study Periods (Feb 21 - Mar 9, 1996)

No.	SAMPLE	MEAN TEMP	R.H	VAPOUR PRESS	RAINFALL	SUNSHINE
		(℃)	(%)	(HECTOPASCAL)	(mm.)	(HR)
1	01B21222	24.0	59	17.8	0	8.0
2	02B22223	24.7	54	17.4	0	7.8
3	03B23224	25.8	55	19.5	0	7.9
4	04B24225	27.4	59	22.4	0	7.6
5	05B25226	28.3	72	27.5	0	7.7
6	06B26228	28.7	74	28.3	0	7.6
7	07B27230	28.7	74	28.6	0	7.8
8	08B28231	28.2	75	28.8	0	6.8
9	09B29232	28.8	74	28.9	0	6.8
10	10B01334	29.0	75	29.1	2	0.2
11	11B02336	28.2	71	25.6	8888	2.5
12	12B03338	29.2	66	24.4	0	5.9
13	13B04339	29.7	69	27.4	0	5.7
14	14B06341	29.0	72	27.9	0	6.6
15	15B07342	29.2	71	27.8	0	6.7
16	16B08343	29.2	71	27.6	0	6.7
17	17B09344	29.4	68	26.8	0	6.2

8888 : Trace, rainfall amount less than 0.1 mm.

Table F-3 Meteorological Data for Yaowaraj Area during the Study Periods (Mar 12- Apr 8, 1996)

No.	SAMPLE	MIN.TEMP	R.H	VAPOUR PRESS	RAINFALL	SUNSHINE
		(°C)	(%)	(HECTOPASCAL)	(mm.)	(HR)
1	01C12345	26.3	71	28.9	0	6.7
2	02C13346	26.2	71	28.7	0	6.9
3	03C20348	26.5	71	29.9	0	7.1
4	04C21349	26.8	71	30.7	0	6.7
5	05C24351	25.3	69	29.3	0	6.9
6	06C25353	27.3	71	30.9	0	6.7
7	07C26355	27.2	71	30.7	0	7.0
8	08C28356	27.7	70	30.4	0	6.3
9	09C31357	27.6	66	29.8	0	7.2
10	10C01458	27.9	68	31.7	0	7.3
11	11C29359	27.4	66	29.1	0	7.2
12	12C30360	27.5	70	30.6	0	6.5
13	13C02461	27.6	70	31.8	0	6.5
14	14C22362	27.4	72	31.0	0	7.3
15	15C05465	23.4	73	29.3	0	6.9
16	16C16367	26.2	73	29.9	0	7.3
17	17C18368	26.4	72	30.2	0	7.2
18	18C19369	26.4	71	29.1	0	7.3
19	19C04470	22.0	75	30.3	8.6	6.1
20	20C08471	27.4	69	31.4	0	6.0

Table F-4 Meteorological Data for Nat.Stat.Off. Area during the Study Periods (Apr 11- Apr 28, 1996)

No.	SAMPLE	MIN.TEMP	R.H	VAPOUR PRESS	RAINFALL	SUNSHINE
		(°C)	(%)	(HECTOPASCAL)	(mm.)	(HR)
1	01D11473	27.6	64	30.3	0	5.5
2	02D12475	26.6	70	31.5	0	6.6
3	03D13477	26.5	64	29.2	14.5	6.4
4	04D14479	23.4	81	27.9	2.9	0.0
5	05D15481	24.4	68	28.0	0	6.8
6	06D16483	27.5	69	30.6	0	7.0
7	07D17484	27.9	72	32.9	0	5.1
8	08D18486	28.1	71	32.5	0	7.2
9	09D19487	28.4	69	31.8	0	7.5
10	10D20488	28.5	65	30.4	0	4.7
11	11D26489	24.2	80	32.1	11.5	3.2
12	12D27491	24.6	81	31.8	0.4	4.6
13	13D22493	25.3	65	26.3	0	1.6
14	14D25495	22.5	75	29.8	25	7.6
15	15D28496	26.5	69	30.2	7.1	6.6

Table F-5 Meteorological Data for Bansomdej Area during the Study Periods (Feb 2 - Apr 29, 1996)

No.	SAMPLE	MEAN TEMP	R.H	VAPOUR PRESS	RAINFALL	SUNSHINE
		(C)	(%)	(HECTOPASCAL)	(mm.)	(HR)
1	01S05203	26.2	55	19.7	0	7.4
2	02S08207	25.7	44	15.6	0	7.5
3	03S11211	24.9	53	17.8	0	7.7
4	04S14214	27.8	73	28.0	0	7.7
5	05S17218	29.6	75	30.1	0	7.8
6	06S20221	25.5	67	21.1	0	5.1
7	07S23227	25.8	55	19.5	0	7.9
8	08S26229	28.7	74	28.3	0	7.6
9	09S29233	28.8	74	28.9	0	6.8
10	10S01335	29.0	75	29.1	2	0.2
11	11S02337	28.2	71	25.6	8888	2.5
12	12S03340	29.2	66	24.4	0	5.9
13	13S18347	30.5	72	30.2	0	7.2
14	14S21350	30.8	71	30.7	0	6.7
15	15S24352	30.6	69	29.3	0	6.9
16	16S27354	31.6	73	31.0	0.4	7.3
17	17S30363	31.3	70	30.6	0	6.5
18	18S02464	32.3	70	31.8	0	6.5
19	19S05466	29.1	73	29.3	0	6.9
20	20S08472	31.6	69	31.4	0	6.0
21	21S11474	32.6	64	30.3	0	5.5
22	22S12476	31.1	70	31.5	0	6.6
23	23S13478	31.5	64	29.2	14.5	6.4
24	24S14480	27.5	81	27.9	2.9	0.0
25	25S15482	30.5	68	28.0	0	6.8
26	26S17485	31.8	72	32.9	0	5.1
27	27S26490	29.4	80	32.1	11.5	3.2
28	28S20492	33.2	65	30.4	0	4.7
29	29S23494	30.4	60	25.9	0	2.6
30	30S29497	29.0	76	31.4	0	5.9

8888 : Trace, rainfall amount less than 0.1 mm.

APPENDIX G

Calibration Curve for Phenenthrene, Fluoranthene and Pyrene

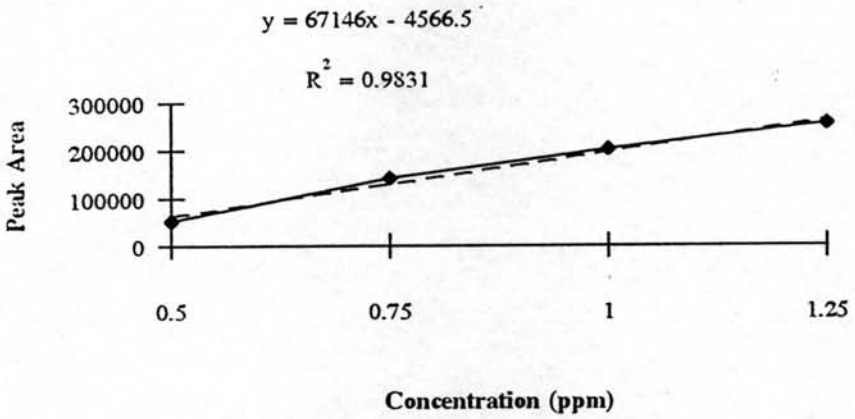


Figure G-1 Calibration Curve of Phenanthrene

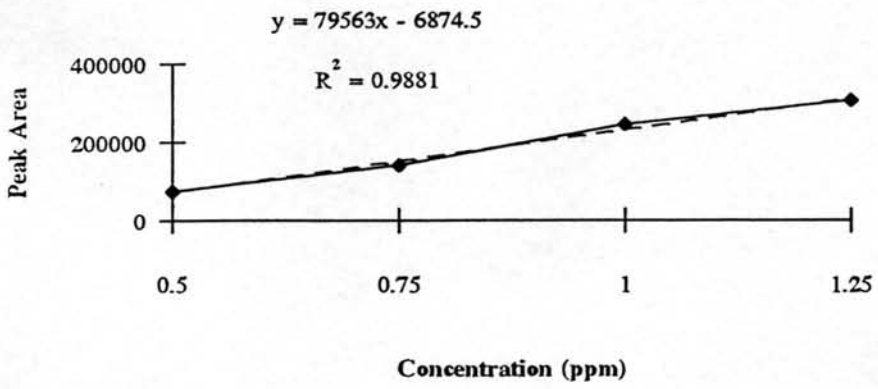


Figure G-2 Calibration Curve of Fluoranthene

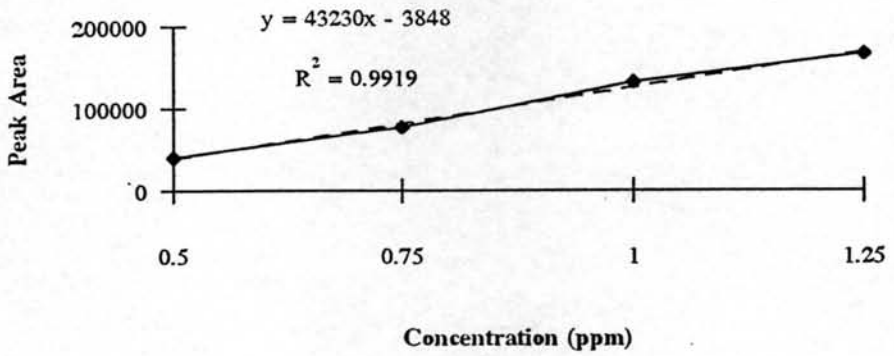


Figure G-3 Calibration Curve of Pyrene

APPENDIX H

Guideline for PNA in Air

ACENAPHTHENE No Standards Set of Limits in Ambient Air

ACENAPHTHELYNE No Standards Set of Limits in Ambient Air

ANTHRACENE No Standards Set of Limits in Ambient Air

BENZO[a]ANTHRACENE
Limits in Ambient Air ($\mu g/m^3$)

Location	0.5 hr	8.0 hr	24 hr	Annual	References
Arizona	0.79(1hr)	-	0.21	0.00057	NATICH
Florida	-	0	0	0.0011	NATICH

BENZOFLUORANTHENE No Standards Set of Limits in Ambient Air

BENZO[ghi]PERYLENE No Standards Set of Limits in Ambient Air

BENZO[a]PYRENE
Limits in Ambient Air ($\mu g/m^3$)

Location	0.5 hr	8.0 hr	24 hr	Annual	References
Arizona	0.79(1HR)	-	0.21	0.00057	NATICH
Connecticut	-	0.1	-	-	NATICH
Florida	-	-	-	0.0003	NATICH
Indiana	-	0.1	-	0.0006	NATICH
Kansas	-	-	-	0.000303	NATICH
Maine	-	-	-	0.00057	NATICH
Michigan	-	-	-	0.0003	NATICH
North Carolina	-	-	-	0.0033	NATICH
New York	-	-	-	0.002	(B)
Pennsylvania	-	-	-	0.0007	NATICH
Texas	0.03	-	-	0.003	NATICH,(A)
Virginia	-	-	-	-	NATICH
Vermont	-	-	-	0.0003	NATICH
Washington	-	-	-	0.0006	NATICH

CHRYSENE

Limits in Ambient Air ($\mu g/m^3$)

Location	0.5 hr	8.0 hr	24 hr	Annual	References
Texas	0.5	-	-	0.5	NATICH,(A)
Virginia	-	-	0	-	NATICH

DIBENZO[a,h]ANTHRACENE

Limits in Ambient Air ($\mu g/m^3$)

Location	0.5 hr	8.0 hr	24 hr	Annual	References
Arizona	0.79(1hr)	-	0.21	0.00057	NATICH
Florida	-	-	-	0.000071	NATICH

FLUORANTHENE

Limits in Ambient Air ($\mu g/m^3$)

Location	0.5 hr	8.0 hr	24 hr	Annual	References
Louisiana	-	-	-	0.06	NATICH

FLUORENE

Limits in Ambient Air ($\mu g/m^3$)

Location	0.5 hr	8.0 hr	24 hr	Annual	References
Connecticut	-	50	-	-	NATICH

INDENO PYRENE No Standards Set of Limits in Ambient Air

NAPHTHALENE

Limits in Ambient Air ($\mu g/m^3$)

Location	0.5 hr	8.0 hr	24 hr	Annual	References
Arizona	630(1hr)	-	400	-	NATICH
CIS(SUN)	3	-	3	-	UNEP,(B)
Connecticut	-	1,000	-	-	NATICH
Florida	-	500	120	-	NATICH
Massachusetts	-	-	14.3	14.3	NATICH
Maine	7,900(15min)	-	870	14	NATICH

North Dakota	790(1hr)	520	-	-	NATICH
Nevada	-	1,190	-	-	NATICH
New York	-	-	-	120	(B)
Oklahoma	-	-	50,000	-	NATICH
South Carolina	-	-	1,250	-	NATICH
Texas	440	-	-	50	NATICH, (A)
Virginia	-	-	870	-	NATICH
Vermont	-	-	-	120	NATICH
Washington	-	-	167	-	NATICH

PHENANTHRENE

Limits in Ambient Air ($\mu g/m^3$)

Location	0.5 hr	8.0 hr	24 hr	Annual	References
Vermont	-	-	-	1.3	NATICH

PYRENE

Limits in Ambient Air ($\mu g/m^3$)

Location	0.5 hr	8.0 hr	24 hr	Annual	References
Vermont	-	-	-	3.4	NATICH

NATICH National Air Toxics Information Clearinghouse
UNEP United Nation Environment Programme
(A) : Texas Air Control Board
(B) :Private Communication from IRPTC-Geneva concerning updated 1988 Russian Standards (1993)

Biography

Miss Jirathiti Thangsuwan was born on July 4, 1971 in Saraburi province, Thailand. She received her Bachelor of Science Degree (Public Health) from the Faculty of Public Health, Mahidol University, in 1993. After graduation, she worked at Environmental Engineering Division, Karat Sanitaryware Public Co.,Ltd.. Then in 1994, she entered the Interdisciplinary master degree programme in Environmental Science, Graduate school, Chulalongkorn University.