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Identification and Toxicological Assessment of Thermal Degradation Products of Organic Constituents of Parts Comprising LLNL Designs ARG Phase 2 Interim Report

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Lawrence Livermore National Laboratory

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Identification and Toxicological Assessment of Thermal Degradation Products of Organic Constituents of Parts Comprising LLNL Designs

Anne E. Lipska-Quinn and Ronald D. Lopez

PURPOSE

The goals of Phase II of the Non Rad Toxics Project were:

1. To identify and quantify the major chemicals comprising smoke from smoldering plastics most prevalent in the LLNL designed weapons as well as materials unique to LANL designed weapons and SANDIA parts found in the LLNL and LANL weapons.
2. To perform toxic assessment of the identified chemicals using existing literature information or TOPKAT, a computer program designed for toxic assessment of organic and certain organo-metallic compounds. This project was in support of the ARG Program needs #15, Table XI, Accident Response Group.

APPROACH

The plastics chosen for this study were obtained largely from PANTEX. Some of the materials were individual pieces of plastics such as polyurethane, polycarbonate, or cellular silicone, while others were small pieces of various cable insulations which consisted of several layers of different types of plastics. This was done to determine whether smoke generated from plastic composites, a more realistic scenario in an accident, would contain a more complex and/or more toxic chemical mixture.

The assessment of the toxic nature of the major components in the smoke was done with the computer program TOPKAT. This program estimates toxic effects of chemical structures using statistical quantitative structure activity relationships (QSAR) techniques, including discriminant and regression analysis.

EXPERIMENTAL

Sample Preparation

Finely divided samples weighing 1 g. each were placed in a glass pyrolyzer which was enclosed in a tube oven capable of being heated up to 1000°C. Samples were placed in the center of the pyrolyzer and heated to

temperature resembling that of smoldering conditions for a period of time needed to completely degrade the samples. One end of the pyrolyzer was connected to an air/inert gas inlet, which supplied a gentle stream of air or nitrogen during the course of sample heating as well as swept the generated smoke into a cold trap, which was connected, to the pyrolyzer at its exit. The cold trap was placed in a Dewar filled with liquid nitrogen. At the end of pyrolysis, the cold trap was brought to room temperature and the liquid contents were diluted with 1ml of ethylene chloride. Prior to analysis, 10 microliters of n-decane (an internal standard) were added to the mixture.

Sample Analysis

The mixture was analyzed via a Hewlett-Packard gas chromatograph equipped with a mass spectrometer. Two microliters of the sample were injected on a fused-silica capillary column (J&W, DB1, bonded phase, 0.25μm phase thickness, 30 m x 02 mm). The inlet mode was spiltless with an injector's temperature of 250°C. A programmed temperature setting were as follows: initial temperature 50 °C, hold 5 min, increase at 5°C /min to 250°C and hold 20 min.

The separated components were identified with the mass spectrometer by comparing the fragmentation patterns of the unknown compounds to those of known compounds compiled in a spectral library system.

Toxic assessment of the major components comprising the various mixtures was done with TOPKAT. The major areas considered were: carcinogenicity, developmental toxicity potential (DTP), mutagenicity (AMES), Rat Oral LD50, Rat Chronic Lowest Observed Adverse Effect (LOEL), Rabbit Eye Irritation and Rabbit Skin Irritation.

RESULTS

Results are tabulated in terms of chromatograms and Excel spreadsheets. The spreadsheets list the name of the main liquid chemicals their amounts (nanograms/microliter and their toxic assessment. The abbreviation CBE is used when values could not be estimated and IND refers to indeterminate values. The six modules used in the toxic assessment studies are summarized as follows:

Rodent Carcinogenicity

The Rodent Carcinogenicity Module comprises four statistically significant and cross-validated quantitative structure-toxicity relationship (QSTR) models, and the data from which the models are derived. Sub-models have been developed for each sex/species: Male Rat, Female Rat, Male Mouse, and Female Mouse. Molecular structure is the only input required to conduct a carcinogenicity assessment. These discriminate models compute the probability of a submitted chemical structure being a carcinogen in male and female rats and male and female mice.

Toxicity values are computed by summing the individual contributions for assessing toxicity values such as LD_{50} or LC_{50}. This sum is transformed into a weight/weight unit (mg/kg). For two group classifications, such as carcinogens/ noncarcinogens this sum is transformed into a probability value between 0.0 to 0.30 and is considered low or negative probabilities. Probabilities greater than 0.30, but less than 0.70, are considered to be a indeterminate (IND) response in an experimental assay, whereas probability values greater than 0.70 are considered high, and are likely to produce a highly positive response in an experimental assay.

DTP

The DTP or Developmental Toxicity Potential module comprises three statistically significant and cross validated quantitative structure-toxicity relationship models and the data from which the models are derived. Each model applies to a specific class of chemicals. Molecular structure is the only input required to conduct a DTP assessment. These discriminant models compute the probability of a submitted chemical structure being a developmental toxicant in the rat. A probability between 0.0 and 0.29 indicate a low potential for developmental toxicity. The probability range between 0.3 and 0.7 refers to indeterminant (IND). The probability range from 0.7 to 1.0 signifies a high potential for developmental toxicity. These models are derived from 273 experimental studies extracted from approximately 3,000 open literature sources.

(AMES) Mutagenicity

The Ames Mutagenicity Module comprises 10 statistically significant and cross- validated quantitative structure - toxicity relationship (QTSR) models, and the data from which the models are derived. Each model applies to a specific class of chemicals. Molecular structure is the only input required to conduct a mutagenicity assessment. These discriminant models compute the probability of a submitted chemical structure being a mutagen in the histidine reversion assay; a probability below 0.29 indicates a non-mutagen (NEG), (NO), and that above 0.7 signifies a mutagen (POS), (YES). The probability range between 0.3 and 0.7 refers to the indeterminate zone (IND). These models are derived from the results of 1866 histidine reversion assays using *Salmonella typhimurium* strains. Experimentally, a chemical is considered NEG only if it does not show any mutagenic activity in all tested strains.

Rat Oral LD 50

The Rat Oral LD_{50} module comprises 19 statistically significant and cross validated quantitative structure-toxicity relationship (QSTR) models, and the data from which the models are derived. Each QSTR model assesses oral acute median

lethal dose, LD_{50}, in the rat of a specific class of chemicals. Molecular structure is the only input required to conduct an LD_{50} assessment. These models are derived from experimental LD_{50} values of approximately 4,000 chemicals.

Rat Chronic LOAEL

The Rat Chronic Lowest Observed Adverse Effect (LOAEL) module comprises statistically significant and cross-validated quantitative structure-toxicity relationship (QSTR) models, and the data from which the models are derived . These models are derived from experimental LOAEL values of approximately 393 chemicals. Each QSTR model assesses the lowest observed adverse effect level in the rat from oral chronic exposure . Molecular structure is the only input required to conduct a LOAEL assessment.

Rabbit Eye Irritation
Or
Rabbit Skin Irritation

This model estimates the severity of eye or skin irritation if a rabbit eye or skin irritation test were performed on the compound of interest. Separate equations are used for compounds with rings and compounds without rings. For compounds with rings there are two submodels: the first separates severes from all others; the second separates moderate/severes from negative/milds. For compounds without rings, the first submodel separates severes from all others, and the second separates negatives from all others. The results from the two submodels are used in a decision table to produce the composite estimate of eye or skin irritation severity.

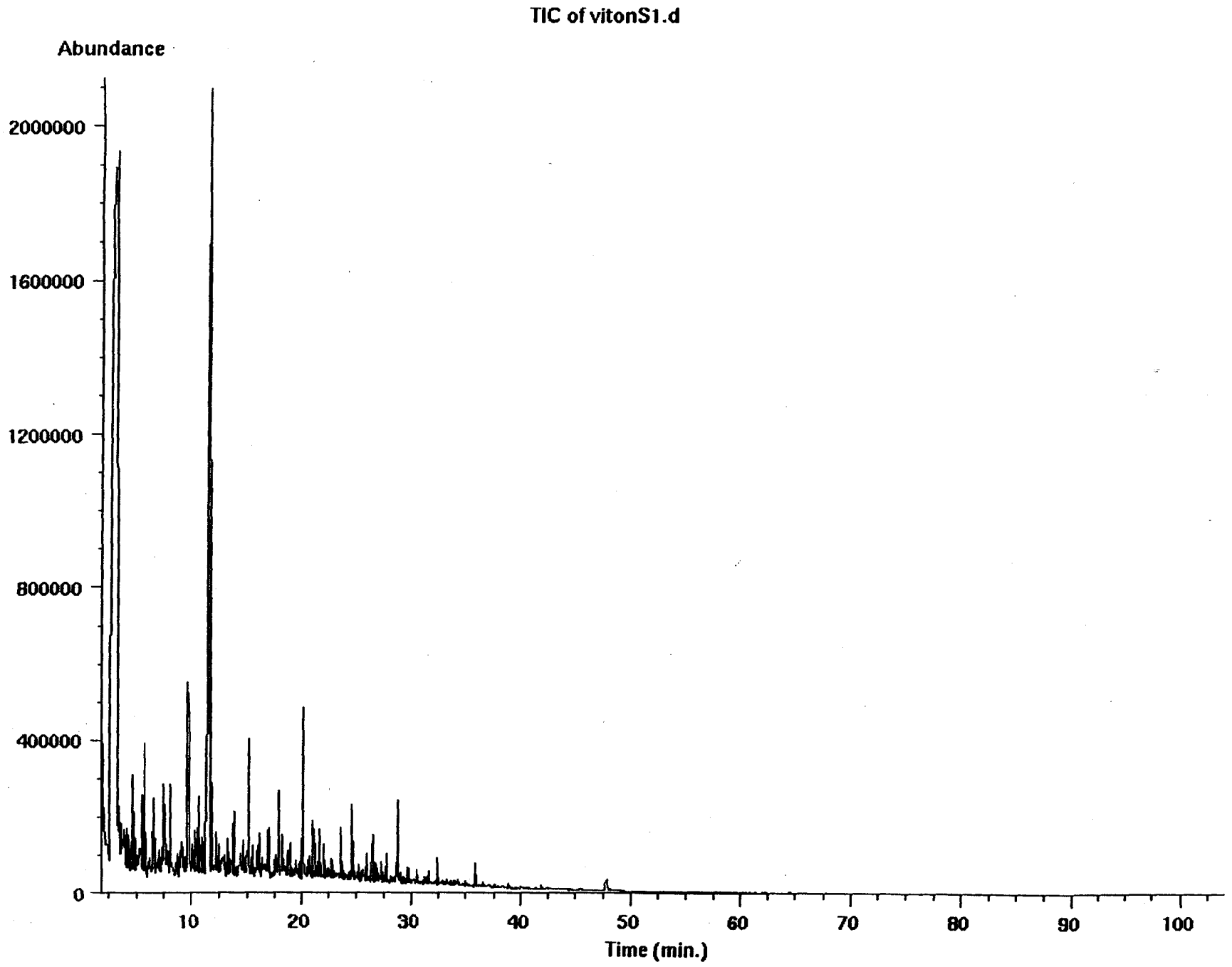
Excel spreadsheets show that all the plastics form smoke during smoldering that contains chemicals that are skin and eye irritants. Of these, a number are categorized as severe eye and skin irritants. The TOPKAT analysis also shows that smoke from the various plastics contains considerable amounts of carcinogens and some mutagens. Plastics responsible for production of chemicals identified as having moderate or high developmental toxicity potential are polystyrene, nomex, polyurethane and cellular silicone. The combination of polyurethane, nylon, and polyvinyledene fluoride yields a mixture with greater number of chemicals with high developmental toxicity potential. On the whole most of the chemicals identified exhibit reasonably high Rat Oral LD_{50}. The Rat Chronic Lowest Observed Adverse Effect in most cases requires exposure of the rat to chemicals at reasonably high concentrations. Exception to this observation is shown in 1.3mg/kg of cyclopropanecarboxylic acid, 2,2-dimethyl-3-2 formed from viton, 3.1 mg/kg of 2.3-dihydro-benzofuran and 4.1mg/kg pyrazine, methyl-4 oxide both formed from polycarbonate, 1.5mg/kg 1.1'-ethenylidene bis-benzene from polystyrene, 4.7mg/kg 2-pentanone,3-methyl from neoprene and teflon insulation.

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE WORK

Results of this preliminary study show that smoke from all plastics investigated contains some chemicals that are carcinogens, mutagens, as well as eye and skin irritants. Results also suggest that a smoldering pile of several different kinds of plastics will lead to production of smoke that will contain more complex and more toxic mixture of chemicals. This study should be extended to other plastics that due to lack of funds were omitted. In addition, these results should be compared with findings from measurements done on smoke generated from flaming combustion where temperatures are much higher, which in turn may lead to different type of chemical mixtures.

Viton S1

Chemical	Retention Time	Carcinogenicity				AMES Mutagenicity	Rat Oral	Irritation Model		Developmental Toxicity	Chronic LOAEL	Amount ng
Compound	(min.)	Female Mouse	Female Rat	Male Mouse	Male Rat		LD 50	Eye	Skin			
Cyclopropanecarboxylic acid,2-22-dimethyl-3-2	24	HIGH	HIGH	NO	HIGH	NO	10 g/kg	MILD	MODERATE	LOW	14 mg/kg	119.3
Ethanone,1-[4-(1-hydroxy-1-methylethyl)phenyl	27.2	LOW	NO	LOW	LOW	LOW	2.7 g/kg	MODERATE	MODERATE	NO	3.5 g/kg	2.2
1-Propanone,3-cyclopentyl-1-(2,4-dimethylphenyl	28.7	HIGH	LOW	NO	LOW	HIGH	965 mg/kg	MILD	MODERATE	HIGH	3.1 g/kg	8.3
Phenol,2,4-bis(1-methylethyl	29.7	HIGH	NO	NO	MODERATE	NO	2.4 g/kg	MILD	SEVERE	NO	388 mg/kg	0.875
Naphtalene,1,6-dimethyl-4-(1-methylethyl	33.5	HIGH	HIGH	NO	MODERATE	HIGH	3.2 g/kg	MODERATE	SEVERE	LOW	26 mg/kg	0.61
Carbonic acid,4-methylphenyl phenyl ester	33.8	LOW	HIGH	HIGH	LOW	HIGH	2.5 g/kg	SEVERE	MODERATE	MODERATE	28 mg/kg	0.73
Benzene,1-methyl-2-[(3-methylphenyl)methyl]	34.4	HIGH	HIGH	NO	LOW	NO	2 g/kg	MODERATE	MODERATE	HIGH	47mg/kg	0.61
Benzoic acid,4-hydroxy-3,5-dimethoxy-,methyl	34.8	LOW	NO	LOW	HIGH	LOW	4 g/kg	SEVERE	MODERATE	HIGH	1.3 g/kg	1.8
Phenol,4,4'-methylenebis-Scaled	39	NO	HIGH	HIGH	HIGH	MODERATE	511 mg/kg	MODERATE	NO	NO	118 mg/kg	0.58
Phenol,4,4'-(1-methylethylidene)bis	41	NO	LOW	LOW	NO	LOW	2.7 g/kg	SEVERE	MODERATE	NO	65 mg/kg	0.62
Phenol,2-[1,-(4-hydroxyphenyl)-1-methylethyl]	42	LOW	NO	NO	NO	NO	2.5 g/kg	SEVERE	MODERATE	NO	40 mg/kg	0.11
[1,1'-Biphenyl]-2-ol,5-(1,1dimethylethyl)	42.6	NO	LOW	LOW	LOW	LOW	4.7 g/kg	SEVERE	MODERATE	LOW	54 mg/kg	0.02
1-Pentanol,2,2,3,3,4,4,5,5-octafluoro	4.2	HIGH	NO	HIGH	NO	NO	755 mg/kg	MODERATE	MODERATE	NO	131 mg/kg	2.75
3-Decene,2,2-dimethyl-,(E)	4.9	HIGH	NO	NO	NO	HIGH	10 g/kg	MODERATE	MODERATE	NO	839 mg/kg	2.1
2,6,10-Dodecatrienoic acid,3,7,11-trimethyl	5.8	HIGH	HIGH	HIGH	LOW	MODERATE	1.3 g/kg	MODERATE	MODERATE	NO	4.2 mg/kg	12.6
Benzoic acid,2-(4-methylbenzoyl)-, methyl ester	5.9	HIGH	NO	HIGH	MODERATE	HIGH	2.9 g/kg	MILD	SEVERE	LOW	130 mg/kg	3.7
Benzene,1-(1,1-dimethylethyl)-4-ethoxy	6.6	NO	HIGH	HIGH	LOW	NO	3.1 g/kg	SEVERE	MODERATE	LOW	219 mg/kg	4.5
1, Propene,1,1,3,3,3- pentafluoro	8.7	HIGH	NO	NO	HIGH	NO	3 g/kg	SEVERE	MODERATE	LOW	87 mg/kg	3.7
Pentane,1,1,2,2,3,3,4,4- octafluoro	10	HIGH	NO	HIGH	NO	NO	1 g/kg	MODERATE	MODERATE	NO	139 mg/kg	35.8
Nonane,3- methyl	10.5	HIGH	NO	NO	HIGH	NO	10 g/kg	MODERATE	MODERATE	NO	7 mg/kg	8.5
2- Propenoic acid, 2- methyl-1,2- ethanediblbis	10.6	NO	LOW	NO	HIGH	NO	10 g/kg	SEVERE	MODERATE	NO	10 g/kg	2.65
Phthalic anhydride	21.2	LOW	NO	LOW	LOW	NO	1.5 g/kg	SEVERE	MILD	LOW	266 mg/kg	8.5
Cyclopropanecarboxylic acid,2,2- dimethyl-3-2	21.4	NO	HIGH	NO	HIGH	LOW	5.8 g/kg	MILD	MODERATE	NO	1.3 mg/kg	3.7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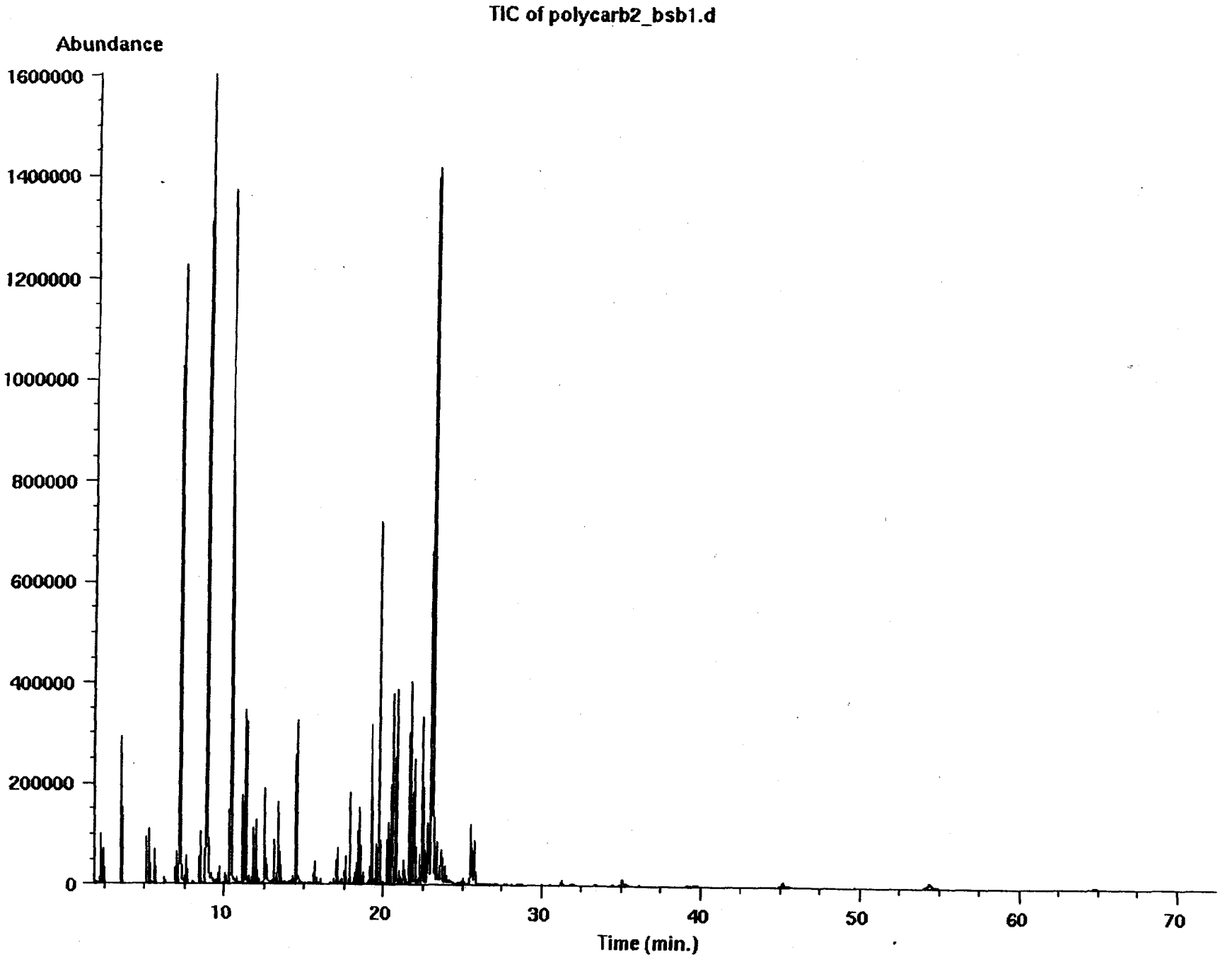
Polycarbonate S1

Chemical Compound	Retention Time (min.)	Carcinogenicity				AMES Mutagenicity	Rat Oral LD 50	Irritation Model		Developmental Toxicity	Chronic LOAEL	Amount ng
		Female Mouse	Female Rat	Male Mouse	Male Rat			Eye	Skin			
Toluene	4.6	HIGH	NO	NO	LOW	MODERATE	513 mg/kg	SEVERE	MODERATE	NO	65 mg/kg	9.2
Benzene,ethyl-Scaled	7	IND	NO	NO	NO	MODERATE	927 mg/kg	SEVERE	MODERATE	NO	68 mg/kg	3.5
Benzene,1,4-dimethyl-Scaled	7.28	IND	NO	NO	NO	HIGH	925 mg/kg	SEVERE	SEVERE	NO	68 mg/kg	8
1,3,5,7-Cyclooctatetraene- Scaled	7.9	HIGH	NO	NO	HIGH	NO	45 mg/kg	MODERATE	MODERATE	NO	407 mg/kg	2.8
Benzene,(1-methylethyl)-Scaled	8.98	HIGH	NO	NO	HIGH	IND	1 g/kg	MODERATE	SEVERE	NO	278 mg/kg	1
Phenol,4- Methyl- Scaled	13	NO	IND	IND	IND	NO	342 mg/kg	SEVERE	SEVERE	IND	30.9 mg/kg	4.5
Phenol,2-ethyl-Scaled	17	NO	NO	NO	IND	NO	658 mg/kg	SEVERE	SEVERE	IND	144 mg/kg	175
Benzofuran,2,3-dihydro-Scaled	18.5	HIGH	IND	NO	MODERATE	HIGH	1.9 g/kg	MODERATE	MODERATE	NO	3.1 mg/kg	80.3
2,4,6-Octatriene,2,6-dimethyl- Scaled	19	HIGH	HIGH	HIGH	HIGH	HIGH	7.3 g/kg	MODERATE	MODERATE	NO	65 mg/kg	45.5
Cyclohexene,1-ethyl-6-ethlidene-Scaled	19.6	HIGH	MODERATE	NO	NO	NO	2.6 g/kg	SEVERE	MODERATE	NO	152 mg/kg	12.3
1,4-benzenediol	20.1	HIGH	NO	NO	IND	NO	3.6 g/kg	SEVERE	MODERATE	NO	4 g/kg	2.5
Pyrazine, methyl -,4-oxide Scaled	20.4	HIGH	NO	NO	IND	NO	3.6 g/kg	SEVERE	MODERATE	NO	4.1 mg/kg	58.5
Ethanone,1-(2-methyphenyl)-Scaled	21	IND	NO	NO	NO	IND	19 mg/kg	SEVERE	MODERATE	NO	124 mg/kg	1.13
Benzeneamine,N,N3,5-trimethyl-Scaled	21.7	HIGH	NO	NO	HIGH	HIGH	1 g/kg	SEVERE	MODERATE	NO	2.7 g/kg	1.5
Allyphenol Scaled	22	HIGH	NO	LOW	NO	NO	260mg/kg	SEVERE	SEVERE	HIGH	85 mg/kg	33.8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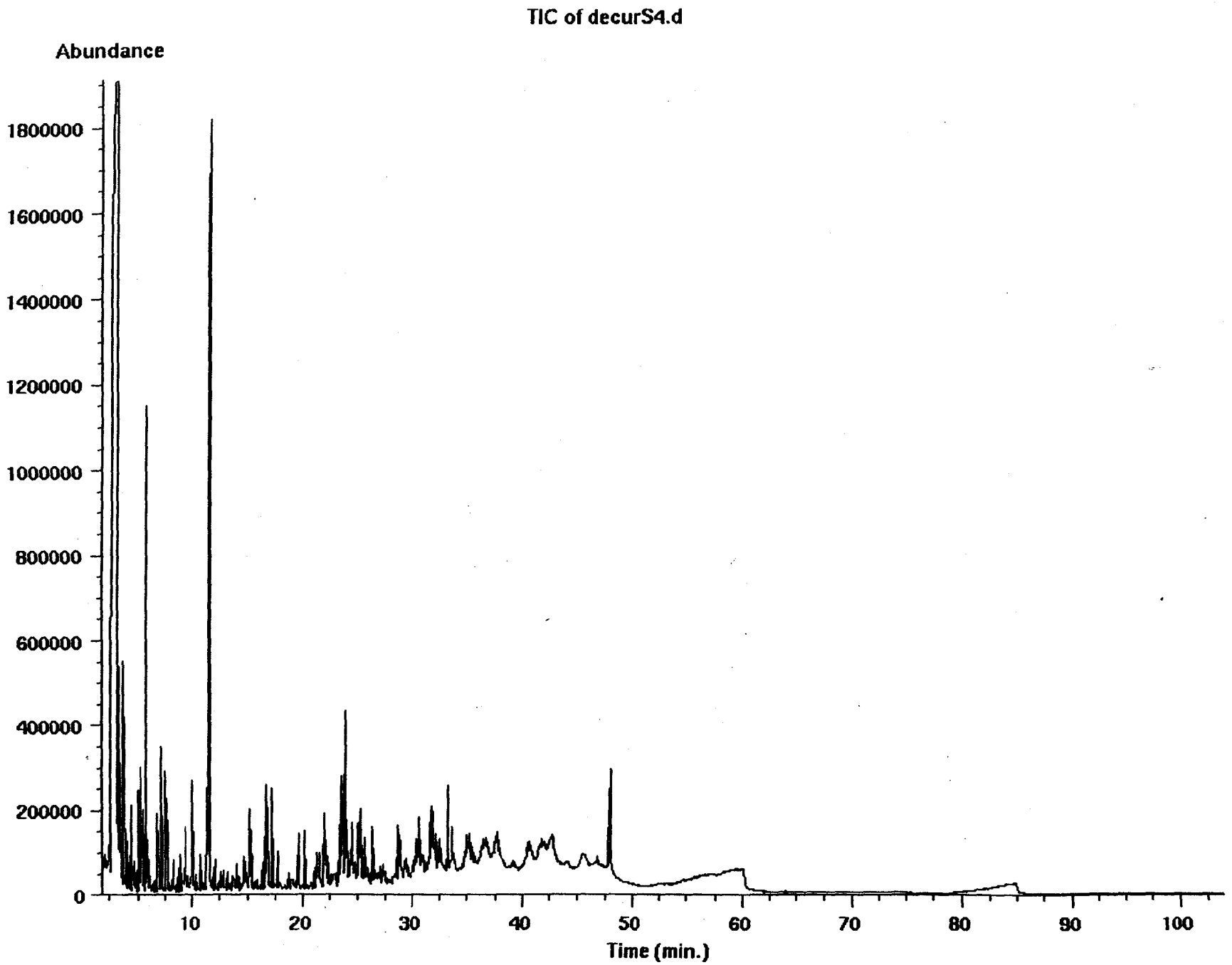
Time (min.)

Polystyrene S1

Chemical Compound	Retention Time (min.)	Carcinogenicity Female Mouse	Carcinogenicity Female Rat	Carcinogenicity Male Mouse	Carcinogenicity Male Rat	AMES Mutagenicity	Rat Oral LD 50	Irritation Model Eye	Irritation Model Skin	Developmental Toxicity	Chronic LOAEL	Amount ng
Cyclopentane,methyl	2	LOW	HIGH	LOW	LOW	LOW	400 mg/kg	MODERATE	SEVERE	HIGH		
Toluene		NO	HIGH	LOW	LOW	NO	3.3 g/kg	MILD	MILD	LOW	18.6 mg/kg	
Bicyclo[4.2.0]Octa-135-triene		HIGH	LOW	LOW	HIGH	LOW	673 mg/kg	SEVERE	MILD	HIGH	168 mg/kg	
Benzaldehyde		HIGH	NO	NO	LOW	NO	1.3 g/kg	MILD	MILD	LOW	170 mg/kg	
(1- methylethenyl)- benzene		NO	NO	HIGH	HIGH	NO	3.6 g/kg	SEVERE	MILD	LOW	256 mg/kg	
1,1'-(1,3-propanediyl) bis- benzene		NO	LOW	HIGH	LOW	NO	9.8 g/kg	MILD	MILD	HIGH	68.8 mg/kg	
6-Phenyl-,(E) -2-hexenal		HIGH	LOW	LOW	NO	NO	5.8 g/kg	MODERATE	MODERATE	HIGH	266 mg/kg	
1-methyl-2-(2-phenylethenyl)- benzene		HIGH	HIGH	LOW	LOW	NO	855 mg/kg	MODERATE	MODERATE	HIGH	10 g/kg	
1,1'-(3-methyl-1- propene -1,3- diyl)bi:benzene		HIGH	LOW	LOW	MODERATE	LOW	2 g/kg	MODERATE	MODERATE	LOW	10 g/kg	
1-Benzoyl-4-Piperidione		LOW	HIGH	LOW	LOW	NO	830 mg/kg	SEVERE	SEVERE	HIGH	197 mg/kg	
1-methyl-2-phenyl-1h-indole		NO	HIGH	LOW	NO	NO	942 mg/kg	MODERATE	SEVERE	LOW	8 mg/kg	
1,1'-[1-(2,2-dimethyl-3-butenyl)-1,3-benzene		HIGH	HIGH	HIGH	MODERATE	HIGH	518 mg/kg	SEVERE	SEVERE	HIGH	246 mg/kg	
Ethanone,2-hydroxy-1-phebnyl		NO	NO	NO	NO	NO	1 g/kg	SEVERE	MODERATE	HIGH	1.3 g/kg	
1,1'-ethenylidenebis-benzene		NO	NO	HIGH	HIGH	NO	1.2 g/kg	SEVERE	SEVERE	LOW	1.5 mg/kg	
(phenoxymethyl)-benzene		NO	HIGH	LOW	LOW	HIGH	2 g/kg	MODERATE	SEVERE	HIGH	34.2 mg/kg	
1,1'-(1-methyl-1,2-ethenediyl) bis-,Benzene		MODERATE	HIGH	HIGH	HIGH	LOW	1.2 g/kg	CBE	CBE	LOW	183 mg/kg	
1,1'-(1-butene-1,4-diyl) bis,(Z)-benzene		HIGH	NO	HIGH	NO	NO	2.5 g/kg	CBE	MODERATE	HIGH	10 g/kg	
Benzophenone		LOW	NO	HIGH	HIGH	NO	2.1 g/kg	SEVERE	SEVERE	LOW	22 mg/kg	
.alpha.-methyl-n-(1-pheny:Benzenemethanamine		HIGH	HIGH	NO	LOW	HIGH	1.4 g/kg	SEVERE	SEVERE	LOW	17.8 mg/kg	
(2-chloro-2-butenyl)- Benzene		LOW	HIGH	HIGH	NO	LOW	1.5 g/kg	MODERATE	MODERATE	HIGH	1.8 g/kg	
[1,1'-Biphenyl]-4-carboxaldehyde		HIGH	LOW	NO	LOW	HIGH	1.3 g/kg	CBE	SEVERE	LOW	524 mg/kg	
1,1'-(1,2-ethenediyl) bis-Benzene		LOW	LOW	NO	LOW	LOW	4.2 g/kg	CBE	SEVERE	HIGH	10 g/kg	
2- Bromo-1,2-diphenyl-Ethanone		NO	NO	HIGH	LOW	NO	1.8 g/kg	SEVERE	SEVERE	HIGH	65 mg/kg	
1-methyl-3-(2-phenylethenyl)-(E)-Benzene		HIGH	LOW	NO	LOW	NO	4.5 g/kg	CBE	MODERATE	HIGH	10 g/kg	

Polystyrene S1

Chemical Compound	Retention Time (min.)	Carcinogenicity				AMES Mutagenicity	Rat Oral LD 50	Irritation Model		Developmental Toxicity	Chronic LOAEL	Amount ng
		Female Mouse	Female Rat	Male Mouse	Male Rat			Eye	Skin			
1,2,3,4-tetrahydro-2-phenyl-Napthalene		HIGH	HIGH	LOW	HIGH	NO	1.6 g/kg	MILD	SEVERE	HIGH	18 mg/kg	
1,3-diphenyl-2-Propanone		NO	LOW	NO	LOW	LOW	3.9 g/kg	CBE	SEVERE	HIGH	39 mg/kg	
2,3-dihydro-1-methyl-3-phenyl-1H-Indene		HIGH	HIGH	LOW	NO	NO	7.7 g/kg	MILD	MILD	LOW	17.8 mg/kg	
1,1'(3-methyl-1-propene-1,3-diyl)bis-Benzene		HIGH	HIGH	HIGH	HIGH	LOW	2.1 g/kg	CBE	MODERATE	LOW	10 g/kg	
1,2-dihydro-4-phenyl-Napthalene		HIGH	LOW	LOW	HIGH	NO	29 mg/kg	MILD	SEVERE	HIGH	17.3 mg/kg	
2-methyl-2-phenyl-1,3-Propanediol		NO	LOW	NO	NO	NO	2.7 g/kg	MILD	MILD	HIGH	5.8 g/kg	
.beta.-methyl-,acetate Benzeneethanol		HIGH	HIGH	NO	HIGH	LOW	3.2 g/kg	CBE	MODERATE	LOW	481 mg/kg	
2,3,5-trimethyl-Phenanthrene		HIGH	HIGH	NO	LOW	HIGH	1.4 g/kg	MILD	MILD	HIGH	117 mg/kg	
1-phenyl-1,2,3=-dioximel,2,3-Butanetrione		NO	HIGH	HIGH	HIGH	HIGH	94 mg/kg	SEVERE	MODERATE	LOW	708 mg/kg	
2-phenyl-Napthalene		HIGH	HIGH	NO	LOW	HIGH	2 g/kg	MILD	CBE	LOW	257 mg/kg	
1,3- diphenyl-2-Propen-1-one		LOW	NO	HIGH	LOW	LOW	1.9 g/kg	SEVERE	SEVERE	LOW	8.5 g/kg	
3,5-xylidino-Ethenetricarbonitrile		LOW	LOW	NO	LOW	HIGH	1.5 g/kg	SEVERE	SEVERE	NO	7.6 mg/kg	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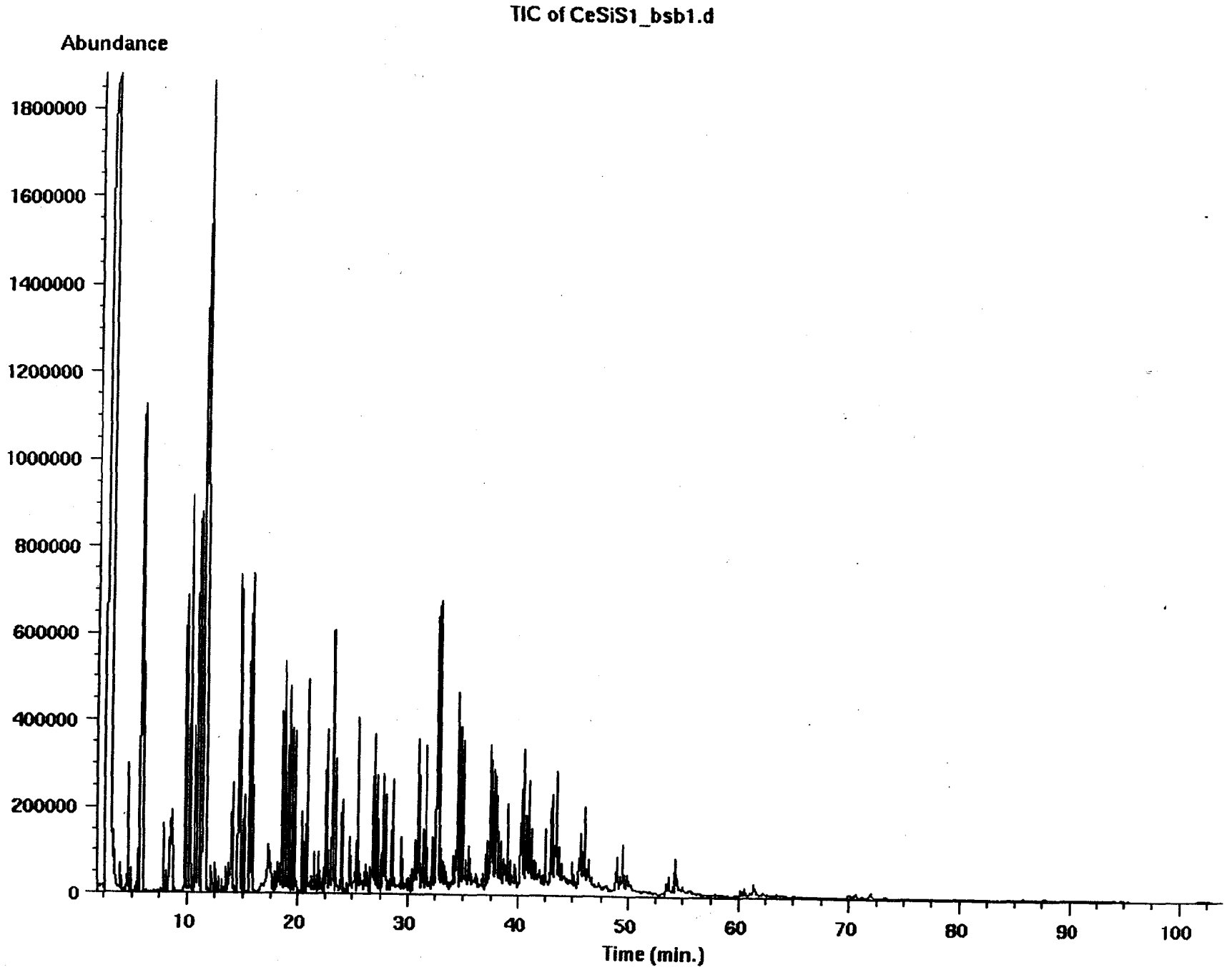
Time (min.)

Cellular Silicone S1

Chemical	Retention Time	Carcinogenicity				AMES Mutagenicity	Rat Oral	Irritation Model		Developmental Toxicity	Chronic LOAEL	Amount ng
Compound	(min.)	Female Mouse	Female Rat	Male Mouse	Male Rat		LD 50	Eye	Skin			
Ethene,chloro	3.2	IND	MODERATE	HIGH	HIGH	HIGH	537 mg/kg	MILD	SEVERE	HIGH	84 mg/kg	56.6
Tolulene	4.6	NO	HIGH	MODERATE	IND	NO	3 g/kg	MILD	MILD	IND	19 mg/kg	10.1
Disiloxane, ethenylpentamethyl	8.6	HIGH	NO	NO	HIGH	MODERATE	8.7 g/kg	SEVERE	SEVERE	NO	400 mg/kg	1.73
Benzaldehyde	10.2	HIGH	NO	NO	IND	NO	1.3 g/kg	MODERATE	SEVERE	IND	170 mg/kg	67.6
Phenol	10.7	NO	NO	NO	IND	NO	866 mg/kg	SEVERE	SEVERE	IND	74 mg/kg	30.92
Cyclotetrasiloxane , octamethyl	11	HIGH	NO	NO	HIGH	NO	7 g/kg	SEVERE	SEVERE	HIGH	673 mg/kg	175.8
Benzenemethanol	12.53	NO	IND	NO	IND	NO	1.4 g/kg	SEVERE	MILD	HIGH	556 mg/kg	6.8
Cyclotrisiloxane , hexamethyl	14	HIGH	NO	NO	NO	NO	5.4 g/kg	SEVERE	SEVERE	HIGH	550 mg/kg	27.7
Hexadecanoic acid , 2- pentadecyl-1,3-dioxan 5	15.6	MODERATE	NO	NO	HIGH	HIGH	3.2 g/kg	MODERATE	MODERATE	NO	10 g/kg	58.6
Benzeneacetic acid,.alpha.,4-bis[(trimethyls	15.7	IND	NO	NO	IND	NO	10 g/kg	SEVERE	SEVERE	HIGH	126 mg/kg	66
Benzoic acid	17.2	IND	HIGH	NO	IND	NO	91 mg/kg	MODERATE	NO	IND	330 mg/kg	2.5
Silane,[1,2,3-benzenetriyltris(oxy)tris[trim	19.1	IND	NO	NO	MODERATE	NO	95 mg/kg	MILD	SEVERE	HIGH	126 mg/kg	39.6
Cyclopentasiloxane,decamethyl	22.5	HIGH	NO	NO	HIGH	NO	9 g/kg	SEVERE	SEVERE	HIGH	850 mg/kg	31.5
Trisiloxane,1,1,1,5,5,5-hexamethyl-3,3-bis	25.4	NO	NO	NO	HIGH	IND	10 g/kg	CBE	SEVERE	HIGH	115 mg/kg	18.3
Acetic acid,bis[(trimethylsily)]-,trimethyl	27.1	NO	NO	NO	IND	NO	10 g/kg	CBE	SEVERE	NO	285 mg/kg	19.1
Ethanedioic acid,bis(trimethylsily)ester	27.4	HIGH	NO	NO	NO	HIGH	3.3 g/kg	CBE	MODERATE	IND	409 mg/kg	7.97
4,5-Dihydrobenzo [E] pyrene	32.6	HIGH	IND	NO	NO	NO	1.7 g/kg	SEVERE	SEVERE	IND	23 mg/kg	89.2
Benzoic acid,2-[(trimethylsily)oxy]-,trimethyl	37.3	HIGH	NO	NO	IND	NO	10 g/kg	SEVERE	SEVERE	IND	2 g/kg	23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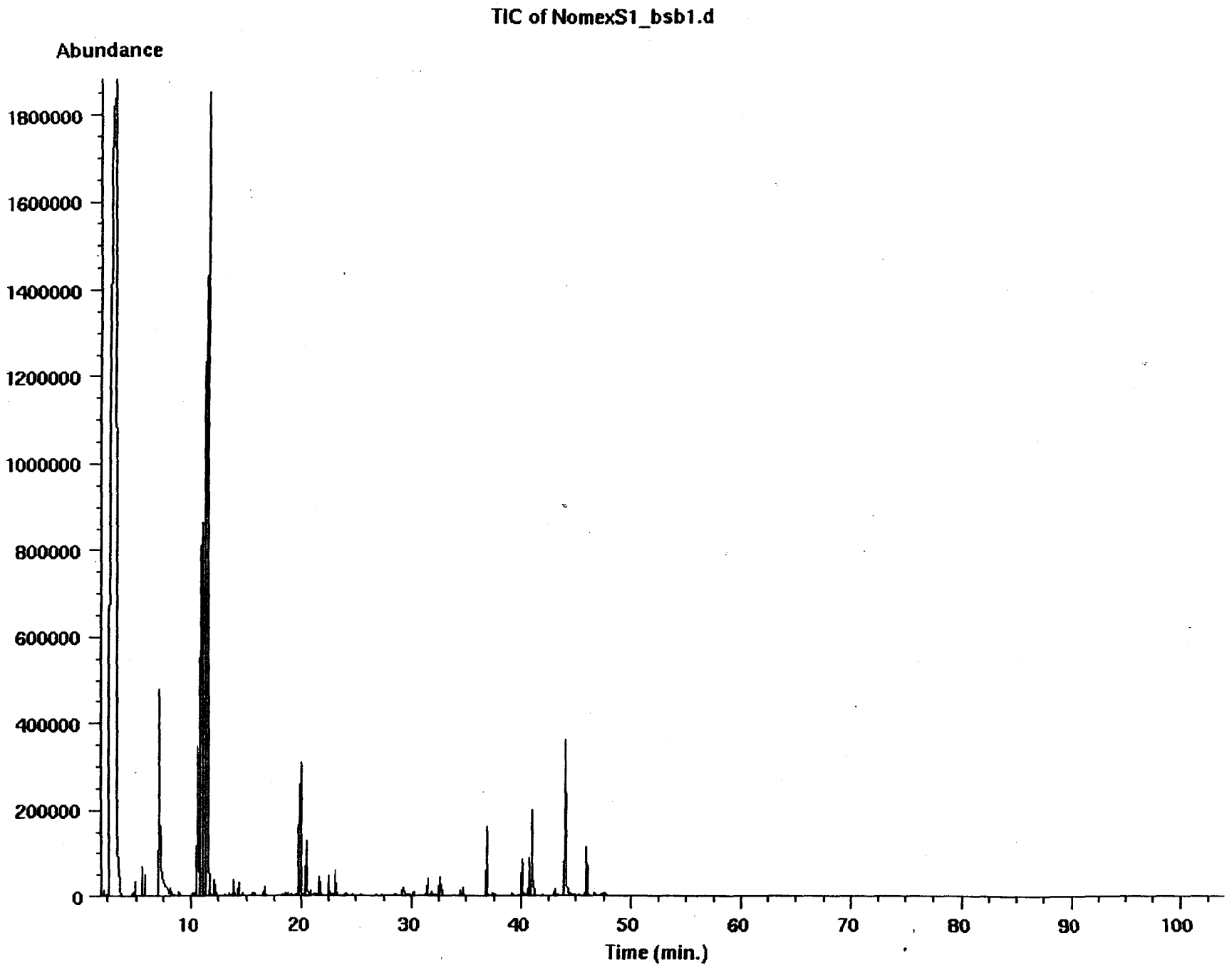
Nomex S1

Chemical	Retention Time	Carcinogenicity				AMES Mutagenicity	Rat Oral	Irritation Model		Developmental Toxicity	Chronic LOAEL	Amount ng
Compound	(min.)	Female Mouse	Female Rat	Male Mouse	Male Rat		LD 50	Eye	Skin			
Ethene,chloro	3.2	LOW	MODERATE	HIGH	HIGH	HIGH	537 mg/kg	SEVERE	SEVERE	HIGH	84 mg/kg	99.6
Tolulene	4.6	NO	HIGH	MODERATE	LOW	NO	3 g/kg	MODERATE	MILD	LOW	19 mg/kg	1.57
Disiloxane, ethenylpentamethyl	8.6	HIGH	NO	NO	HIGH	IND	8.7 g/kg	MODERATE	MILD	NO	400 mg/kg	43.3
Benzaldehyde	10.2	HIGH	NO	NO	LOW	NO	1.3 g/kg	MODERATE	MILD	LOW	170 mg/kg	1.08
Phenol	10.7	NO	NO	NO	LOW	NO	866 mg/kg	SEVERE	SEVERE	LOW	74 mg/kg	27
Cyclotetrasiloxane , octamethyl	11	HIGH	NO	NO	HIGH	NO	7 g/kg	MODERATE	MODERATE	HIGH	673 mg/kg	42.3
Benzenemethanol	12.53	NO	LOW	NO	LOW	NO	1.4 g/kg	SEVERE	SEVERE	HIGH	556 mg/kg	1.16
Cyclotrisiloxane , hexamethyl	14	HIGH	NO	NO	NO	NO	5.4 g/kg	SEVERE	MODERATE	HIGH	550 mg/kg	3.65
Hexadecanoic acid , 2- pentadecyl-1,3-dioxan 5	15.6	MODERATE	NO	NO	HIGH	HIGH	3.2 g/kg	MODERATE	MILD	NO	10 g/kg	0.87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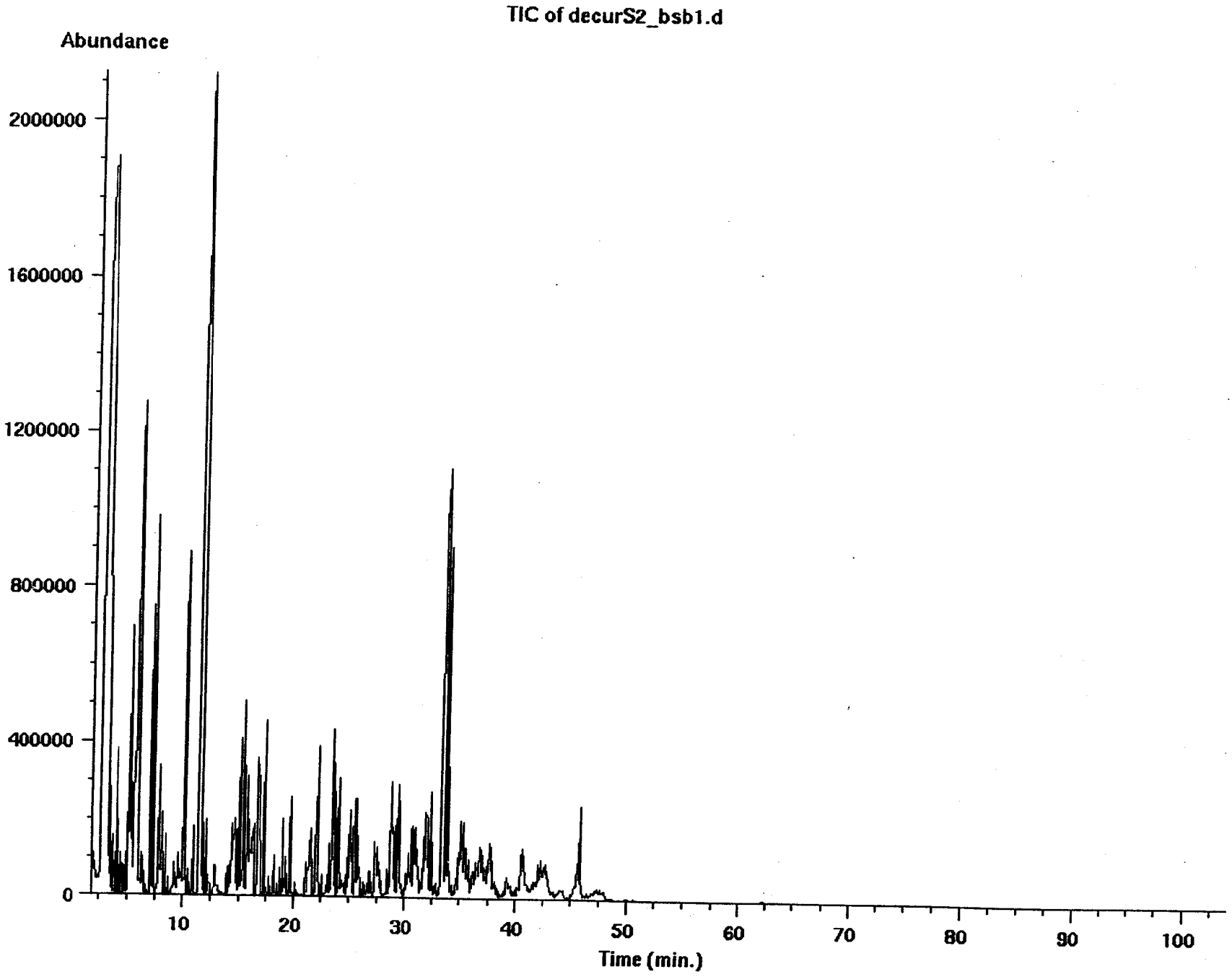
Time (min.)

Polyurethane S3

Chemical Compound	Retention Time (min.)	Carcinogenicity Female Mouse	Carcinogenicity Female Rat	Carcinogenicity Male Mouse	Carcinogenicity Male Rat	AMES Mutagenicity	Rat Oral LD 50	Irritation Model Eye	Irritation Model Skin	Developmental Toxicity	Chronic LOAEL	Amount ng
2-Hexanol,5-methyl-Scaled	3.8	IND	NO	NO	HIGH	IND	5g/kg	SEVERE	MODERATE	HIGH	312.7 mg/kg	165.3
Propane,2,2'-[ethylidenebis(oxy)]bis	5.5	NO	HIGH	NO	HIGH	IND	2.7 g/kg	MODERATE	NO	NO	351 mg/kg	22
2-Propanone,1-(1-methylethoxy)	5.8	IND	HIGH	NO	HIGH	IND	3.3 g/kg	SEVERE	MILD	IND	51 mg/kg	58
Ethanol,2-[2-(2-methoxyethoxy]-,acetate	8.2	HIGH	HIGH	NO	HIGH	NO	10 g/kg	SEVERE	MODERATE	IND	77.3 mg/kg	2.5
Oxirane,[(1-methylethoxy)methyl]	9.6	IND	HIGH	NO	HIGH	YES	1 g/kg	SEVERE	SEVERE	NO	354 mg/kg	9.6
Aziridine,1-(methoxymethyl)	10.7	IND	HIGH	HIGH	HIGH	YES	1.6 g/kg	MILD	MILD	IND	9 mg/kg	3.4
Butanoic acid,4-methoxy-,methyl ester	12.1	IND	HIGH	NO	HIGH	IND	8 g/kg	SEVERE	MODERATE	NO	154 mg/kg	5.1
Oxirane,[(1-methylethoxy)methyl]	12.7	IND	HIGH	NO	HIGH	YES	1 g/kg	CBE	CBE	NO	354 mg/kg	5.5
2-Butanol,3,3'-oxybis	12.9	NO	NO	NO	IND	IND	4 g/kg	SEVERE	MODERATE	IND	3 g/kg	6.8
1-Propanol,3-[3-(1-methylethoxy)propoxy]	14.7	IND	IND	NO	IND	IND	6 g/kg	SEVERE	MODERATE	NO	326 mg/kg	2.6
Thiocyanic acid,propyl ester	17.2	NO	NO	NO	NO	NO	1.6 g/kg	SEVERE	MODERATE	HIGH	10 mg/kg	13.3
1,3-Dioxane,2-methyl	20.2	IND	HIGH	HIGH	IND	YES	2 g/kg	SEVERE	MILD	HIGH	258 mg/kg	11.5
2-Propanol,1-[1-methyl-2-(2-propenyloxy)ethoxy]	21.1	HIGH	NO	NO	IND	IND	9.5 g/kg	SEVERE	MODERATE	NO	261 mg/kg	16
Butanoic acid , 3-hydroxy-3-methyl	22	NO	IND	IND	IND	NO	2.3 g/kg	SEVERE	SEVERE	HIGH	300mg/kg	4.7
1,3-Dioxolane,2-ethyl-4-methyl-Scaled	22.2	IND	HIGH	NO	IND	YES	4 g/kg	SEVERE	MILD	IND	385 mg/kg	0.93
Ethane,1,2-diethoxy-Scaled	23.8	IND	IND	IND	IND	IND	2.7 g/kg	SEVERE	MILD	IND	240 mg/kg	2.1
1,3-Dioxane,4,4-dimethyl	25.5	HIGH	HIGH	NO	HIGH	NO	2.2 g/kg	SEVERE	MILD	HIGH	330 mg/kg	3.7
Octane,1-(1-methylethoxy	25.7	NO	IND	IND	HIGH	IND	8.9 g/kg	SEVERE	MODERATE	NO	20 mg/kg	4.1
2-Decanone-3 hydroxy-3 methyl	27.3	NO	NO	NO	HIGH	NO	3.4 g/kg	SEVERE	MODERATE	NO	727 mg/kg	8.7
2-Heptanone,3-hydroxy-3-methyl-Scaled	29.2	NO	NO	NO	IND	NO	850 mg/kg	SEVERE	MODERATE	HIGH	576 mg/kg	3.7
3-Hexanol,5-methyl-Scaled	29.4	IND	NO	NO	HIGH	IND	5.5 g/kg	SEVERE	MODERATE	IND	8.8 mg/kg	2.3
1-Propanol,3[3-(1-methylethoxy)propoxy]-Scaled	29.5	NO	IND	NO	HIGH	IND	3.8 g/kg	MODERATE	NO	NO	50 mg/kg	2.8
Hexose,2,3-dideoxy-5,6-O-(1-methylethylidene)	32.1	IND	IND	HIGH	IND	YES	1.5 g/kg	SEVERE	MODERATE	HIGH	819 mg/kg	3.4
2,5,8,11,14,17-Hexaoxaoctadecane	33.4	HIGH	HIGH	NO	HIGH	NO	5 g/kg	SEVERE	SEVERE	NO	1.4 g/kg	17.5
1-Propanol,3-[3-(methylethoxy)propoxy]-Scaled	33.8	IND	IND	IND	HIGH	IND	6 g/kg	MODERATE	MILD	IND	1.7 g/kg	5.1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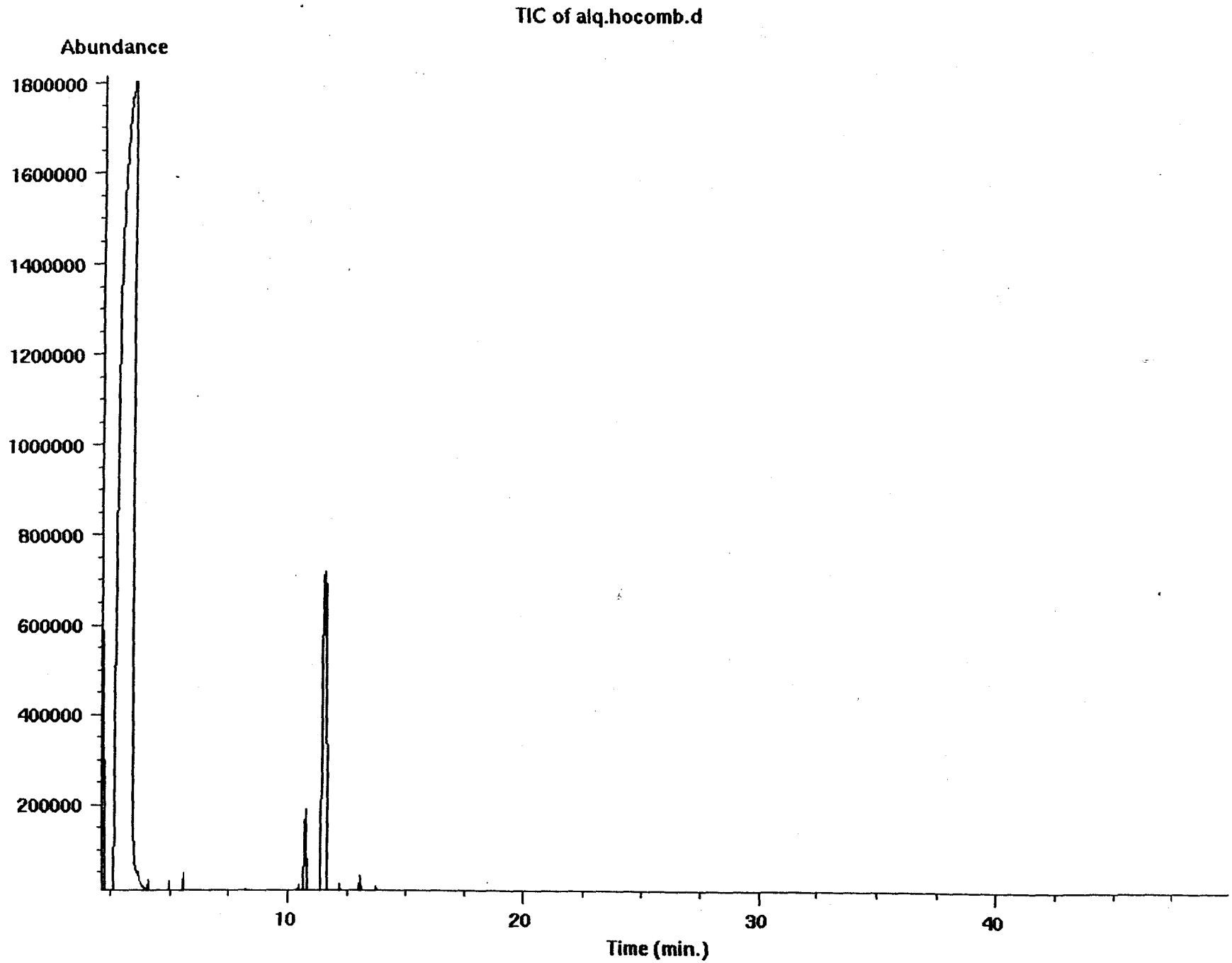
Time (min.)

HoneyComb

Material: Resin impregnated paper	Retention Time	Carcinogenicity				AMES Mutagenicity	Rat Oral	Irritation Model		Developmental Toxicity	Chronic LOAEL	Amount ng
Chemical Compound	(min.)	Female Mouse	Female Rat	Male Mouse	Male Rat		LD 50	Eye	Skin			
Hexane	2.27	NO	NO	IND	HIGH	NO	10 G/kg	MILD	MODERATE	IND	660 mg/kg	36
Ethane,1,1,2- trichloro	3.2	HIGH	HIGH	LOW	HIGH	HIGH	423 mg/kg	MODERATE	HIGH	IND	3.2 mg/kg	292
Ethene,tetrachloro	5.5	IND	HIGH	HIGH	IND	IND	1.5 g/kg	HIGH	HIGH	IND	193 mg/kg	1.9
Butane,2,2- dimethyl	8.2	IND	IND	IND	LOW	IND	5.7 g/kg	SEVERE	MODERATE	HIGH	868 mg/kg	0.61
Phenol	10.4	NO	NO	NO	IND	NO	266 mg/kg	SEVERE	SEVERE	LOW	74 mg/kg	0.6
Benzenesulfonic acid, 4- hydroxy	11.5	NO	NO	NO	NO	NO	546 mg/kg	SEVERE	MILD	HIGH	134 mg/kg	152
Phenol , 2- methyl	13	IND	NO	NO	IND	NO	289 mg/kg	SEVERE	SEVERE	IND	73.2 mg/kg	2.7
Phenol,4 - methyl	13.7	NO	IND	IND	IND	NO	90.8 mg/kg	SEVERE	SEVERE	IND	31 mg/kg	1.46
Pyridine,2,4- dimethyl	14.8	NO	HIGH	IND	NO	NO	106 mg/kg	SEVERE	SEVERE	HIGH	50 mg/kg	0.2
Pyridine ,3,4- dimethyl	16.1	HIGH	HIGH	IND	IND	NO	165 mg/kg	SEVERE	MODERATE	HIGH	50 mg/kg	0.35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Time (min.)

Cable 215068

Material:Polyethelene/Neoprene/Silicone Rubber/Polyurethane	Retention Time	Carcinogenicity				AMES Mutagenicity	Rat Oral	Irritation Model		Developmental Toxicity	Chronic LOAEL	Amount ng
ChemicalCompound	(min.)	Female Mouse	Female Rat	Male Mouse	Male Rat		LD 50	Eye	Skin			
Toluene	4.7	LOW	HIGH	IND	LOW	NO	3.3 g/kg	MILD	MILD	LOW	18.6 mg/kg	11
Cyclobutanone,2,3,3-trimethyl	5.2	LOW	LOW	LOW	LOW	NO	1.7 g/kg	MODERATE	MILD	HIGH	305 mg/kg	26.2
3-Nonene,3-methyl-,(E)	5.5	HIGH	LOW	LOW	HIGH	NO	10 g/kg	MODERATE	MILD	LOW	229 mg/kg	6.4
1,2-Oxaborolane,2-ethyl-4,5-dimethyl	5.9	LOW	LOW	HIGH	LOW	YES	3.9 g/kg	SEVERE	SEVERE	HIGH	395 mg/kg	6
Benzene,1,2-dimethyl	7.9	HIGH	HIGH	LOW	LOW	NO	2.2 g/kg	SEVERE	SEVERE	LOW	10.5 mg/kg	2.65
Benzene,1,3-dimethyl	8.2	LOW	HIGH	LOW	LOW	NO	2.5 g/kg	SEVERE	SEVERE	LOW	6.5 mg/kg	0.76
Benzene,ethynyl	8.5	LOW	LOW	HIGH	LOW	NO	1.5 g/kg	NEGATIVE	NEGATIVE	LOW	52 mg/kg	5.3
Ethanedioic acid,dibutyl ester	9	LOW	LOW	LOW	HIGH	NO	2.4 g/kg	MODERATE	MILD	LOW	533 mg/kg	3.45
1,3,5,7-Cyclooctatetraene	9.3	HIGH	LOW	LOW	HIGH	NO	45 mg/kg	MODERATE	MILD	LOW	407 mg/kg	8.7
Cyclopropane,1-methyl-2-pentyl	9.4	LOW	LOW	LOW	LOW	NO	4 g/kg	SEVERE	MILD	HIGH	484 mg/kg	8.75
Butane,1,3-dichloro	10.1	HIGH	LOW	HIGH	LOW	YES	2.6 g/kg	SEVERE	SEVERE	IND	27 mg/kg	3.75
Propane,1-chloro	11.5	LOW	LOW	LOW	LOW	YES	6 g/kg	MILD	MILD	HIGH	64 mg/kg	2.3
3-Heptanol,3-methylPentane,1-(1-butenyloxy)-,(E)	12.5	HIGH	LOW	LOW	LOW	YES	10 g/kg	MODERATE	MILD	LOW	360 mg/kg	7.9
Benzofuran	14.7	HIGH	LOW	LOW	LOW	YES	1.5 g/kg	SEVERE	SEVERE	LOW	3 mg/kg	66.2
1-Pentanol,2,2,4-trimethyl	15.8	LOW	LOW	LOW	HIGH	NO	1.6 g/kg	MILD	MILD	LOW	30 mg/kg	14.9
Benzene,1-methyl-4-(1-methylethyl)	16.5	HIGH	HIGH	LOW	HIGH	NO	2 g/kg	MODERATE	MILD	LOW	28 mg/kg	2.53
1-Hexanol,2-ethyl	17.2	IND	LOW	LOW	LOW	NO	2 g/kg	SEVERE	SEVERE	HIGH	371 mg/kg	33.6
Benzene,1-ethynyl-4-methylPhenol,2-methyl	17.4	LOW	LOW	HIGH	LOW	NO	1.6 g/kg	MODERATE	MILD	LOW	20 mg/kg	6.8
Phenol,2-methyl	18.4	LOW	LOW	LOW	LOW	NO	289 mg/kg	SEVERE	MILD	LOW	73 mg/kg	5.3

Cable 215068

Material:Polyethelene/Neoprene/Silicone Rubber/Polyurethane	Retention Time	Carcinogenicity				AMES Mutagenicity	Rodent	Irritation Model		Developmental Toxicity	Chronic LOAEL	Amount ng
Chemical Compound	(min)	Female Mouse	Female Rat	Male Mouse	Male Rat		LD 50	Eye	Skin			
Cyclopentane,1,2,3-trimethyl-,(1.alpha.,2.a	19.8	LOW	LOW	LOW	LOW	NO	4.1 g/kg	MILD	MILD	HIGH	313 mg/kg	4.83
2-Dodecene,(Z)	20.7	HIGH	LOW	LOW	LOW	YES	10 g/kg	MODERATE	MILD	LOW	613 mg/kg	3.6
Benzofuran,2-methyl	21.3	HIGH	LOW	LOW	LOW	YES	74 mg/kg	SEVERE	MILD	LOW	14 mg/kg	0.92
2H1,2,3-Benzothiadiazine,2-[2,4-dinitrophenyl	22.5	LOW	LOW	LOW	LOW	NO	1.3 g/kg	SEVERE	MODERATE	LOW	101 mg/kg	0.2
3-Hexanol,2,2-dimethyl	22.9	LOW	LOW	LOW	IND	NO	3.6 g/kg	MODERATE	MILD	LOW	923 mg/kg	5
1-Butanol,4-butoxy	23.4	LOW	LOW	LOW	IND	NO	4 g/kg	MODERATE	MILD	LOW	275 mg/kg	29.2
Benzene,1,3-butadienyl	24	HIGH	LOW	HIGH	LOW	YES	2 g/kg	MODERATE	MODERATE	LOW	67 mg/kg	2.9
Naphthalene,1,2-dihydro	24.5	HIGH	HIGH	LOW	IND	NO	2 g/kg	SEVERE	SEVERE	LOW	42 mg/kg	3
Phenol,3-ethyl	25.1	LOW	LOW	LOW	LOW	NO	3 g/kg	SEVERE	SEVERE	LOW	95 mg/kg	18.6
Phenol,2-(2-propenyl)	26.3	LOW	LOW	LOW	LOW	NO	1.8 g/kg	SEVERE	SEVERE	IND	157 mg/kg	4.3
Benzoic acid	26.8	LOW	HIGH	LOW	LOW	NO	3 g/kg	MODERATE	NEGATIVE	LOW	332 mg/kg	6.62
Phenol,4-(1-methylethyl)	28.9	HIGH	LOW	LOW	IND	NO	1.9 g/kg	SEVERE	SEVERE	LOW	116 mg/kg	33.5
Naphthalene,2-methyl	33.1	HIGH	HIGH	LOW	LOW	YES	1.4 g/kg	SEVERE	SEVERE	LOW	67 mg/kg	13.6
Naphthalene,1-methyl	32.3	HIGH	HIGH	LOW	LOW	YES	5 g/kg	SEVERE	SEVERE	LOW	34 mg/kg	9.15
Phenol,2-methyl-5-(1-methylethyl)	32.4	HIGH	IND	LOW	IND	NO	4 g/kg	SEVERE	SEVERE	LOW	102 mg/kg	5
Benzoic acid,2-[4-[(acetylamino)sulfonyl]	33.4	HIGH	LOW	HIGH	LOW	NO	122 mg/kg	SEVERE	SEVERE	LOW	6 mg/kg	11.7
Naphthalene1,2,3,4-tetrahydro-1,5,8-trimethyl	36.7	HIGH	LOW	LOW	LOW	YES	2.7 g/kg	SEVERE	SEVERE	LOW	22.6 mg/kg	4.75
Benzenemethanol,4-chloro-,alpha.-methyl	37.8	LOW	LOW	LOW	LOW	NO	3.6 g/kg	SEVERE	MILD	IND	277 mg/kg	3.9
2H-1,2,3-Benzothiadiazine,2-[2,4-dinitrophen	38.4	LOW	HIGH	LOW	LOW	YES	5.3 g/kg	MODERATE	NEGATIVE	HIGH	451 mg/kg	9.3
1H-Isoindole-1,3(2H)-dione,2-methyl	39.2	HIGH	LOW	LOW	LOW	NO	1.2 g/kg	MODERATE	MODERATE	LOW	14 mg/kg	3.25
Naphthalene,2-ethenyl	39.6	HIGH	HIGH	LOW	LOW	YES	8 g/kg	SEVERE	SEVERE	HIGH	207 mg/kg	3.12
1-Naphthol,6,7-dimethyl	40	LOW	HIGH	LOW	LOW	YES	3 g/kg	SEVERE	SEVERE	LOW	58 mg/kg	1.4
Biphenylene	40.5	HIGH	IND	LOW	LOW	YES	130 mg/kg	SEVERE	SEVERE	LOW	10 g/kg	5.3
1H-Isoindole-1,3(2H-dione	42	HIGH	LOW	LOW	LOW	NO	1.2 g/kg	SEVERE	SEVERE	LOW	14 mg/kg	3.56
Boric acid(H3Bo3)tripentyl ester	42.8	LOW	LOW	LOW	HIGH	NO	10 g/kg	MODERATE	MILD	LOW	854 mg/kg	2

Cable 215068

Material:Polyethelene/Neoprene/Silicone Rubber/Polyurethane	Retention Time	Carcinogenicity				AMES Mutagenicity	Rat Oral	Irritation Model		Developmental Toxicity	Chronic LOAEL	Amount ng
Chemical Compound	(min.)	Female Mouse	Female Rat	Male Mouse	Male Rat		LD 50	Eye	Skin			
Phytol	43.3	HIGH	HIGH	HIGH	HIGH	NO	10 g/kg	MODERATE	MILD	LOW	191 mg/kg	5
9H-Fluorene	47.3	HIGH	IND	LOW	LOW	YES	67 [illegible]/kg	MODERATE	MODERATE	LOW	10 g/kg	3.7
1-Hexadecene	48.3	HIGH	LOW	LOW	HIGH	NO	10 g/kg	SEVERE	MODERATE	LOW	817 mg/kg	10
Oxirane,2,2'-[1,4-butanediylbis9oxymethylene)	49.3	HIGH	HIGH	LOW	LOW	YES	2.0 g/kg	SEVERE	SEVERE	LOW	10 g/kg	29
Morpholine	50.4	HIGH	LOW	HIGH	HIGH	YES	400 mg/kg	SEVERE	SEVERE	HIGH	19 mg/kg	4
5-Octadecene,(E)	52.8	LOW	LOW	LOW	LOW	NO	10 g/kg	SEVERE	MODERATE	LOW	970 mg/kg	2.76
Furan,2-butyltetrahydro	55.8	LOW	HIGH	LOW	LOW	YES	1.3 g/kg	MILD	MILD	LOW	598 mg/kg	4.4
Anthracene	56.3	HIGH	HIGH	LOW	LOW	NO	2.5 g/kg	SEVERE	MODERATE	HIGH	234 mg/kg	11
Cyclododecane,ethyl	57.5	LOW	LOW	LOW	LOW	NO	1.7 g/kg	SEVERE	MILD	LOW	10 g/kg	2.9
Boran,diethyl(1-ethyl-2-(methoxymethyl)-1	61.4	HIGH	HIGH	LOW	LOW	NO	10 g/kg	SEVERE	MODERATE	LOW	869 mg/kg	54.8
Cycloheptane,1,2-dimethoxy-,trans	61.8	LOW	LOW	LOW	LOW	NO	5 g/kg	MILD	MILD	LOW	853 mg/kg	3
5-Eicosene,(E)	65.6	LOW	LOW	LOW	LOW	NO	10 g/kg	SEVERE	MODERATE	LOW	868 mg/kg	6.3
2,6-Octadiene-4,5-diol	68.1	HIGH	LOW	IND	LOW	YES	40 mg/kg	MODERATE	MILD	LOW	166 mg/kg	9.1
Pyrene	69.7	LOW	LOW	LOW	LOW	NO	3 g/kg	SEVERE	MILD	HIGH	12.4 mg/kg	5
Phenol,4,4'-(1-methylethylidene)bis	73.6	LOW	LOW	IND	LOW	NO	3 g/kg	SEVERE	MILD	LOW	66.5 MG/KG	10.5
Isophthalic acid,butyl ester,ester with butyl	74.5	LOW	LOW	IND	HIGH	NO	10 g/kg	SEVERE	MILD	HIGH	187 mg/kg	17
1,2-Benzenedicarboxlic acid,butyl2-methyl	79	LOW	LOW	LOW	HIGH	NO	10 g/kg	SEVERE	SEVERE	LOW	388 mg/kg	29.5
Methane,bis(neopentyloxy)	79.7	LOW	LOW	LOW	HIGH	NO	1.3 g/kg	SEVERE	SEVERE	LOW	492 mg/kg	38.3
1-Eicosene	80.3	LOW	LOW	HIGH	HIGH	NO	10 g/kg	MODERATE	MILD	LOW	398 mg/kg	3.15
Triphenlene	81.9	HIGH	LOW	LOW	LOW	YES	1.5 g/kg	MILD	NEGATIVE	HIGH	11.4 mg/kg	7.1
Benzamine,4,4'methylenebis[2-chloro	82.6	HIGH	LOW	HIGH	LOW	YES	1.7 g/kg	SEVERE	MODERATE	LOW	123 mg/kg	1.1
1,2-Benzenedicarboxylic acid,mono[2-ethylhexyl)	82.9	IND	HIGH	LOW	LOW	NO	2.1 g/kg	MILD	MILD	LOW	189 mg/kg	10.5
Cyclopentane,1-bromo-2-methoxy-,trans	84.2	LOW	HIGH	HIGH	LOW	NO	1.1 g/kg	SEVERE	MILD	LOW	133 mg/kg	2.8
1,2-Benzenedicarboxylic acid,diisooctyl ester	84.5	LOW	LOW	HIGH	HIGH	NO	10 g/kg	MODERATE	MILD	HIGH	9 g/kg	3
1H-Imidazole,4-nitro	86.7	HIGH	HIGH	HIGH	LOW	YES	1.5 g/kg	SEVERE	SEVERE	HIGH	10 mg/kg	155

Cable 215068

Material:Polyethelene/Neoprene/Silicone Rubber/Polyurethane	Retention Time	Carcinogenicity				AMES Mutagenicity	Rat Oral	Irritation Model		Developmental Toxicity	Chronic LOAEL	Amount ng
Chemical Compound	(min.)	Female Mouse	Female Rat	Male Mouse	Male Rat		LD 50	Eye	Skin			
Pyrrolo[1,2-b] isothiazole, 5,6-dihydro-2-methyl	86.9	HIGH	LOW	LOW	LOW	NO	3.5 g/kg	MILD	MILD	HIGH	7 mg/kg	23
Octane, 2,6,6-trimethyl	90.8	LOW	LOW	LOW	HIGH	NO	10 g/kg	MODERATE	MODERATE	LOW	7 mg/kg	8.5
2H,8H-Benzo[1,2-b:5,4-b']dipyran-10-propanol	91.2	LOW	LOW	LOW	LOW	NO	2.5 g/kg	SEVERE	MILD	LOW	10 g/kg	15.1
Propanoic acid, 2-methyl-, 3-hydroxy-2,4,4-trans	94.2	LOW	LOW	LOW	HIGH	NO	3.7 g/kg	SEVERE	MODERATE	LOW	465 mg/kg	11
2,6-Octadiene-4,5-diol	98	HIGH	LOW	LOW	LOW	YES	21 mg/kg	MODERATE	MODERATE	LOW	468 mg/kg	5.76
2- Nonadecanone	101	LOW	LOW	LOW	HIGH	NO	2.7 g/kg	SEVERE	MODERATE	LOW	248 mg/kg	3.6

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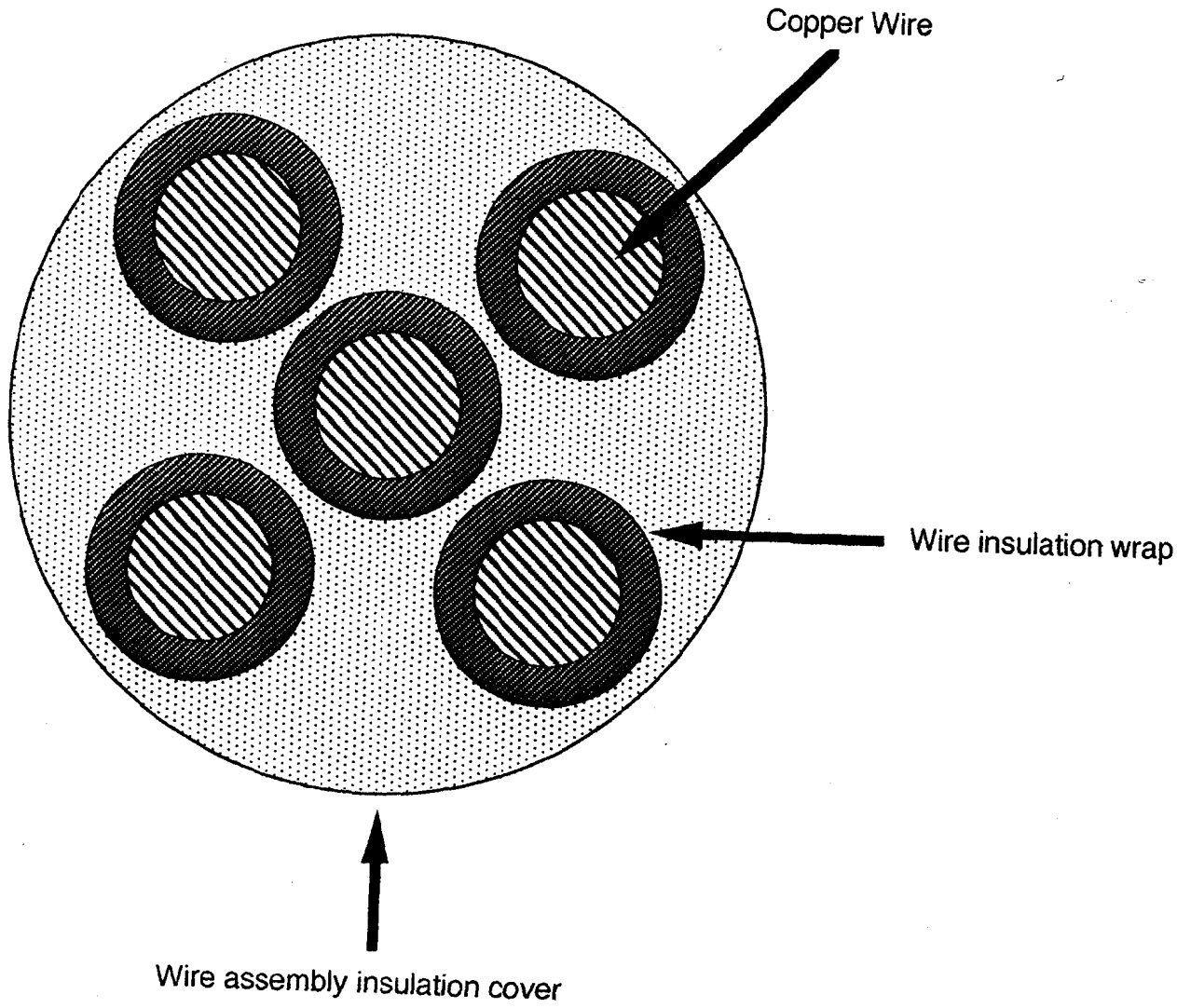
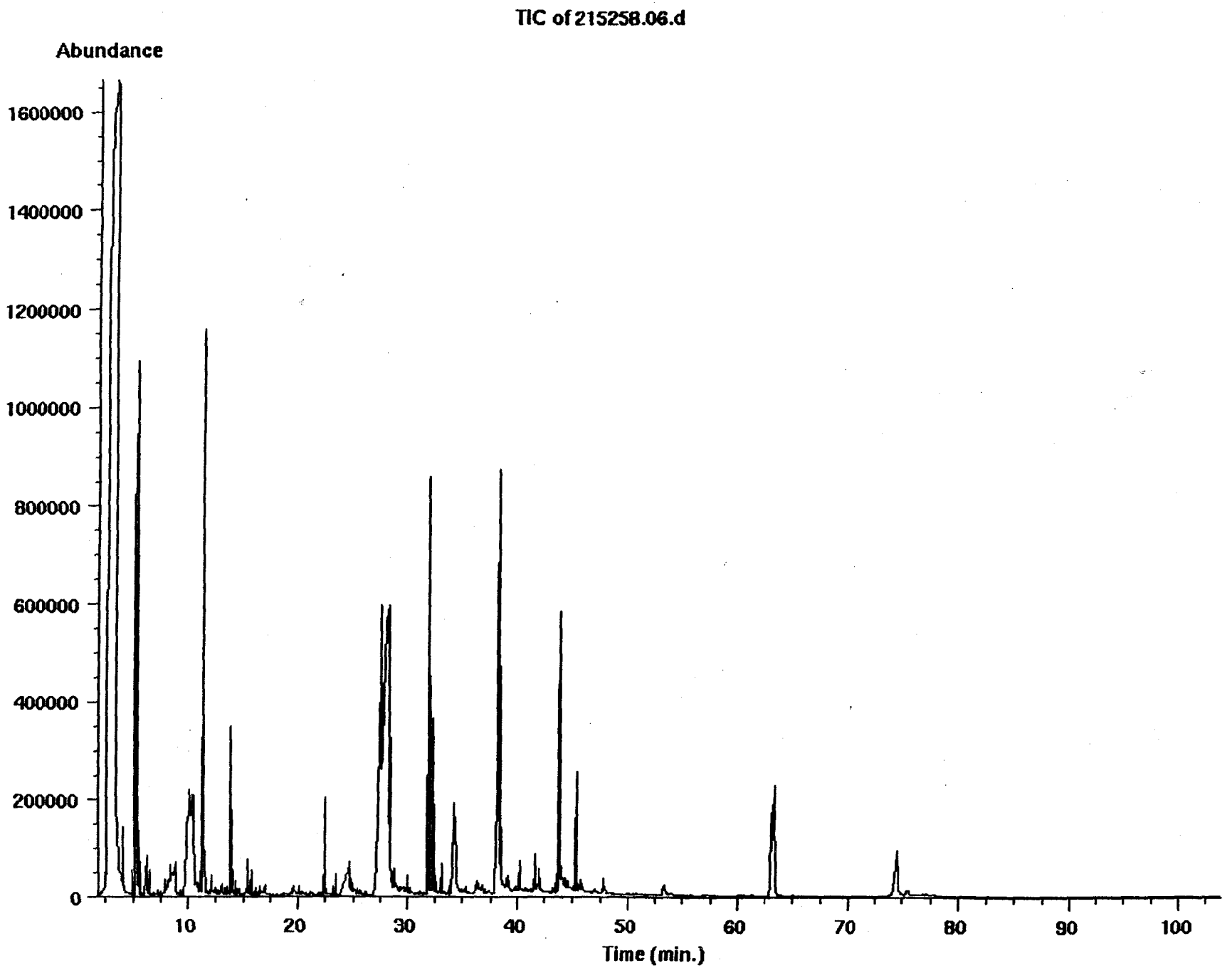
Cable 215258-06



Cable 215258

Material : nylon,polyurethane, polyvinylidene fluoride	Retention Time	Carcinogenicity				AMES Mutagenicity	Rat Oral	Irritation Model		Developmental Toxicity	Chronic LOAEL	Amount ng
Chemical Compound	(min.)	Female Mouse	Female Rat	Male Mouse	Male Rat		LD 50	Eye	Skin			
Ethane,1,2-dichloro	3.1	LOW	LOW	HIGH	HIGH	YES	2.4 g/kg	SEVERE	SEVERE	HIGH	84.6 mg/kg	97.03
Propane 1,1,2-trichloro	4.1	LOW	LOW	LOW	LOW	NO	2.2 g/kg	MODERATE	MILD	LOW	712 mg/kg	6.77
Cyclopentanone	5.2	LOW	LOW	LOW	LOW	NO	1.3 g/kg	MODERATE	MODERATE	LOW	150 mg/kg	237.5
Butanoic acid	8.6	LOW	HIGH	LOW	LOW	NO	3.1 g/kg	SEVERE	MODERATE	HIGH	227.5 mg/kg	20.87
1,4-Butanediol	9.9	LOW	LOW	LOW	LOW	NO	2.4 g/kg	SEVERE	SEVERE	HIGH	346 mg/kg	23.3
Undecane,4,4-dimethyl	22.4	LOW	LOW	LOW	HIGH	NO	10 g/kg	SEVERE	MODERATE	LOW	236 mg/kg	26.28
1H-1,2,4-Triazole=3=carboxaldehyde,5-methyl	28.3	HIGH	LOW	LOW	LOW	IND	2.3 g/kg	SEVERE	MODERATE	LOW	206 mg/kg	270.68
2-Cyclopenten-1-one,3amino-2-methyl	31.9	LOW	HIGH	LOW	LOW	YES	2 g/kg	SEVERE	MODERATE	HIGH	19.8 mg/kg	200.6
Pyridine,2,3,4,5-tetrahydro	33.05	LOW	LOW	LOW	LOW	YES	4.8 g/kg	MODERATE	MILD	HIGH	57.3 mg/kg	6.27
Pentanoic acid,5-bromo	34.1	HIGH	HIGH	LOW	LOW	YES	6.0 g/kg	SEVERE	SEVERE	HIGH	34 mg/kg	66.02
1,6-Dioxacyclododecane-7,12-dion	38.5	LOW	LOW	LOW	LOW	NO	3.4 g/kg	SEVERE	MODERATE	HIGH	958 mg/kg	18.77
Propanenitrile,3-butoxy	41.7	LOW	LOW	LOW	HIGH	LOW	1.8 g/kg	SEVERE	SEVERE	HIGH	14 mg/kg	10.6
Decanoic acid,silver(1+) salt	43.6	LOW	LOW	LOW	HIGH	NO	8.5 g/kg	SEVERE	SEVERE	LOW	539 mg/kg	128.3
2-Oxazolidinone,3---ethenyl	45.3	HIGH	HIGH	HIGH	LOW	YES	4.7 g/kg	SEVERE	SEVERE	HIGH	26.3mg/kg	29.3
1-Propanone,2-methyl-1-[2-(1-methylethyl)cyclo	74.5	LOW	LOW	LOW	HIGH	NO	4.8 g/kg	MODERATE	MILD	LOW	70 mg/kg	60.06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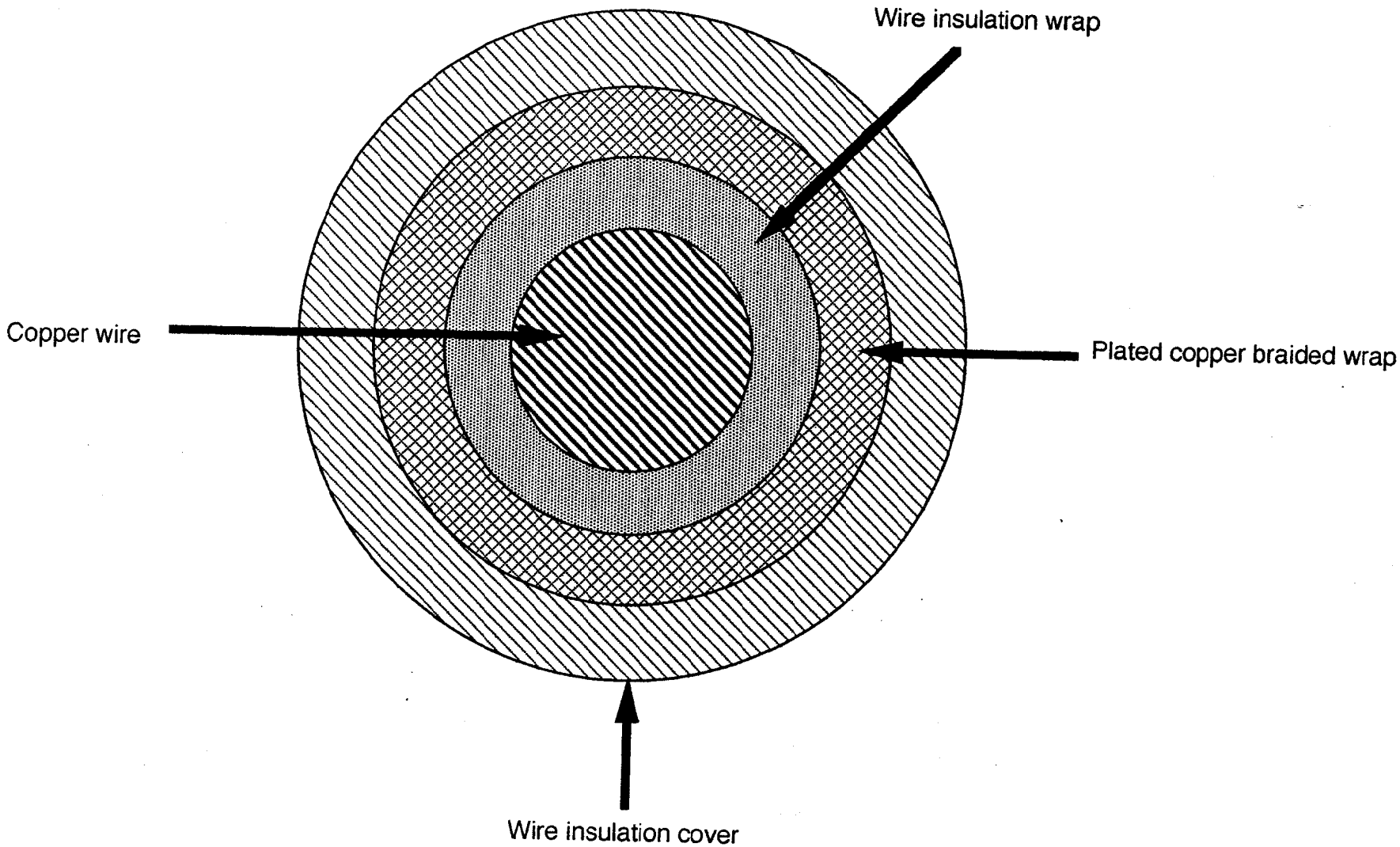


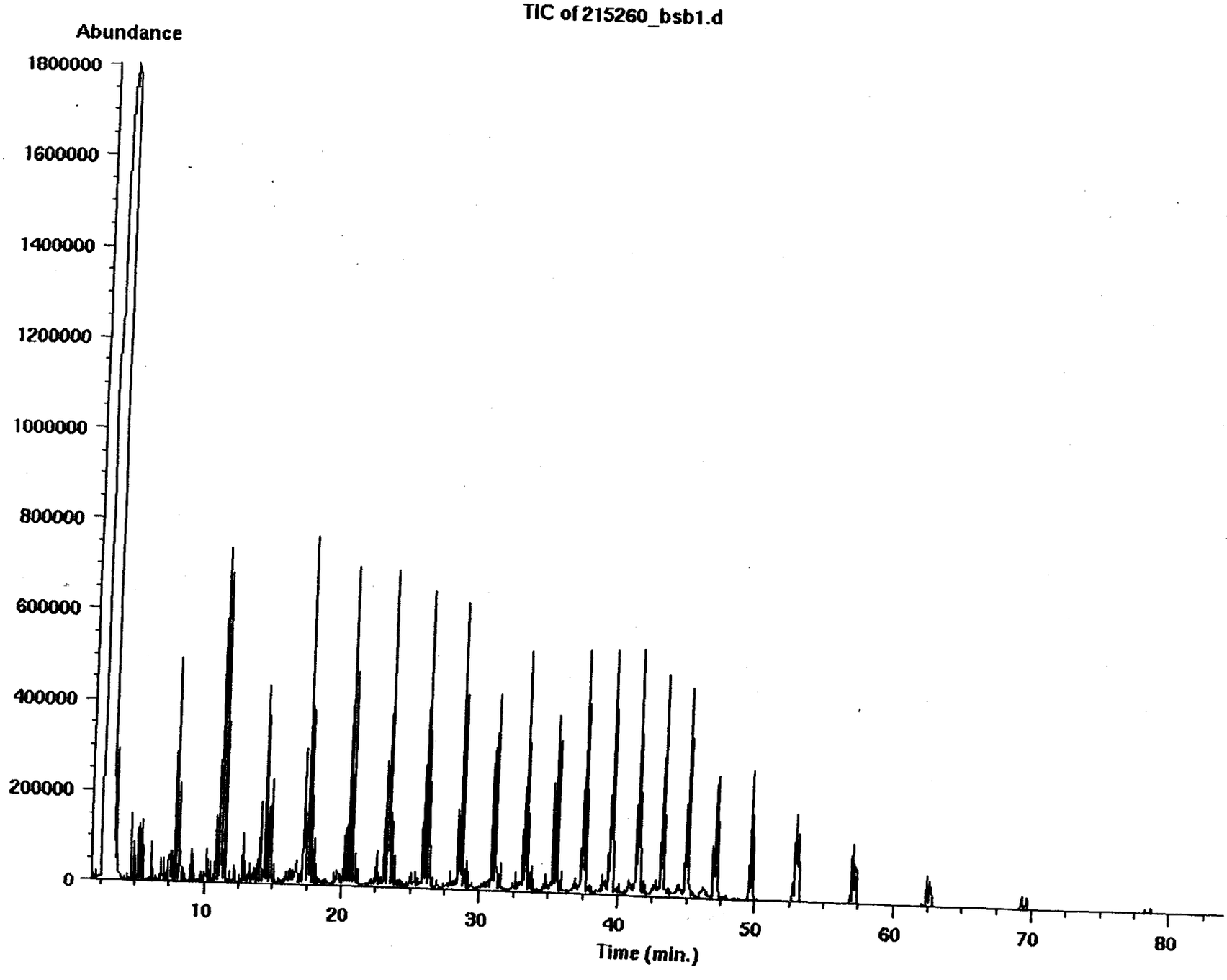
RDL 98

Cable 215260

Material: polyvinylacetate	Retention Time	Carcinogenicity				AMES Mutagenicity	Rat Oral	Irritation Model		Developmental Toxicity	Chronic LOAEL	Amount ng
ChemicalCompound	(min.)	Female Mouse	Female Rat	Male Mouse	Male Rat		LD 50	Eye	Skin			
2H-pyran-2-one,tetrahydro-3,6-dimethyl	2.1	LOW	HIGH	HIGH	HIGH	NO	4.4 g/kg	SEVERE	SEVERE	LOW	55 mg/kg	1
Ethane,1,2-dichloro	2.7	LOW	LOW	HIGH	HIGH	HIGH	2.4 g/kg	SEVERE	SEVERE	HIGH	84.6 mg/kg	27.6
Tolulene	4.7	LOW	HIGH	IND	LOW	NO	3.3 g/kg	SEVERE	MODERATE	LOW	18.6 mg/kg	15.06
1-Octene	5.25	HIGH	LOW	LOW	LOW	NO	10 g/kg	SEVERE	MODERATE	LOW	408 mg/kg	29.05
Hexane,3-ethyl	5.45	LOW	LOW	LOW	HIGH	NO	10 g/kg	MODERATE	MILD	LOW	861 mg/kg	18
Ethene,tetrachloro	5.57	LOW	HIGH	HIGH	LOW	NO	1.5 g/kg	SEVERE	SEVERE	LOW	193 mg/kg	5.25
Benzene,1,2-dimethyl	7.1	HIGH	HIGH	LOW	LOW	NO	2.2 g/kg	SEVERE	SEVERE	LOW	10.5 mg/kg	5.85
1,3,5,7-Cyclooctatetrane	7.9	LOW	LOW	HIGH	HIGH	NO	4.5 g/kg	MODERATE	MILD	HIGH	439 mg/kg	37.96
Octane	8.25	LOW	LOW	LOW	HIGH	NO	10 g/kg	MODERATE	MILD	LOW	827 mg/kg	17.95
Cyclobutane,1,2-diethenyl	9.2	HIGH	LOW	HIGH	LOW	NO	1 g/kg	SEVERE	MILD	LOW	8.7 mg/kg	6.77
1,6,Octadiene	10.8	HIGH	LOW	LOW	LOW	YES	10 g/kg	MODERATE	MODERATE	NO	259 mg/kg	8.78
2-Decene,E	11.1	HIGH	LOW	LOW	LOW	YES	10 g/kg	SEVERE	MODERATE	LOW	511 mg/kg	52.8
Benzene,1-propynyl	12.8	LOW	LOW	HIGH	LOW	NO	3 g/kg	SEVERE	MODERATE	LOW	52.8 mg/kg	9.46
Cyclooctane,ethenyl	14.1	HIGH	LOW	LOW	LOW	NO	1.8 g/kg	MODERATE	MILD	LOW	183 mg/kg	9.8
Cyclopropane,1-heptyl-2-methyl	14.4	LOW	LOW	LOW	LOW	NO	1.1 g/kg	SEVERE	MODERATE	HIGH	921 mg/kg	43.8
Octacosane	14.7	LOW	HIGH	HIGH	HIGH	YES	CBE	MODERATE	MILD	CBE	CBE	22
Naphthalene	17.4	HIGH	HIGH	LOW	IND	NO	1.8 g/kg	SEVERE	SEVERE	LOW	42 mg/kg	19
3-Dodecene	17.6	LOW	LOW	LOW	LOW	YES	10 g/kg	SEVERE	MODERATE	LOW	613 mg/kg	39.9
Tridecane	17.8	LOW	LOW	LOW	HIGH	NO	10 g/kg	MODERATE	MODERATE	LOW	263 mg/kg	38.2

Cable 215260

Material: polyvinylacetate	Retention Time	Carcinogenicity				AMES Mutagenicity	Rat Oral	Irritation Model		Developmental Toxicity	Chronic LOAEL	Amount ng
ChemicalCompound	(min.)	Female Mouse	Female Rat	Male Mouse	Male Rat		LD 50	Eye	Skin			
Benzothiazole	18.6	HIGH	HIGH	LOW	LOW	YES	2.1 g/kg	MODERATE	MODERATE	LOW	60 mg/kg	5.6
1-Heptene,5-methoxy-4-methyl	20.3	HIGH	LOW	LOW	LOW	NO	6.3 g/kg	MODERATE	MODERATE	LOW	5.5 mg/kg	11.4
Undecane,2,3-dimethyl	20.8	LOW	LOW	LOW	HIGH	NO	6 g/kg	SEVERE	MODERATE	LOW	70 mg/kg	20.44
Phenol,2-(1,,-dimethylethyl)-4-methyl	22.6	LOW	LOW	LOW	LOW	NO	1.3 g/kg	SEVERE	SEVERE	LOW	132 mg/kg	8.2
5-Tetradecene	23.4	LOW	LOW	LOW	LOW	IND	10 g/kg	MODERATE	SEVERE	LOW	715 mg/kg	37
Cyclopropane,nonyl	26.1	LOW	LOW	LOW	HIGH	NO	1.7 g/kg	SEVERE	MILD	LOW	280 mg/kg	39.5
Cyclodecanol	28.4	LOW	LOW	LOW	LOW	NO	2.7 g/kg	SEVERE	MODERATE	HIGH	284 mg/kg	3
3-Hexadecene,(Z)	28.7	LOW	LOW	LOW	LOW	IND	10 g/kg	SEVERE	MODERATE	LOW	817 mg/kg	13
Pentadecane	28.8	LOW	LOW	LOW	HIGH	NO	5 g/kg	MODERATE	MODERATE	LOW	300 mg/kg	31.5
1-Hexadecanol	30.1	LOW	LOW	LOW	HIGH	NO	7.3 g/kg	SEVERE	MODERATE	LOW	424 mg/kg	34.45
Anthracene	33.2	HIGH	HIGH	LOW	LOW	NO	2.5 g/kg	SEVERE	MODERATE	IND	234 mg/kg	14
5 - Octadecane	33.4	LOW	LOW	LOW	LOW	IND	10 g/kg	SEVERE	MODERATE	LOW	970 mg/kg	31.8
Tridecane,6-propyl	33.5	HIGH	LOW	LOW	HIGH	NO	10 g/kg	MODERATE	MODERATE	LOW	483 mg/kg	22.2
3-Eicosene,(E)	35.5	LOW	LOW	LOW	LOW	IND	10 G/KG	MODERATE	MODERATE	LOW	227 mg/kg	44.5
Cyclohexanehexanol	39.5	LOW	LOW	LOW	LOW	NO	7.6 g/kg	SEVERE	MODERATE	HIGH	900 mg/kg	12.2
2,4-Heptadienoic acid,6-methyl-,ethyl ester	40.1	HIGH	LOW	LOW	HIGH	YES	7.4 g/kg	SEVERE	SEVERE	LOW	836 mg/kg	5.3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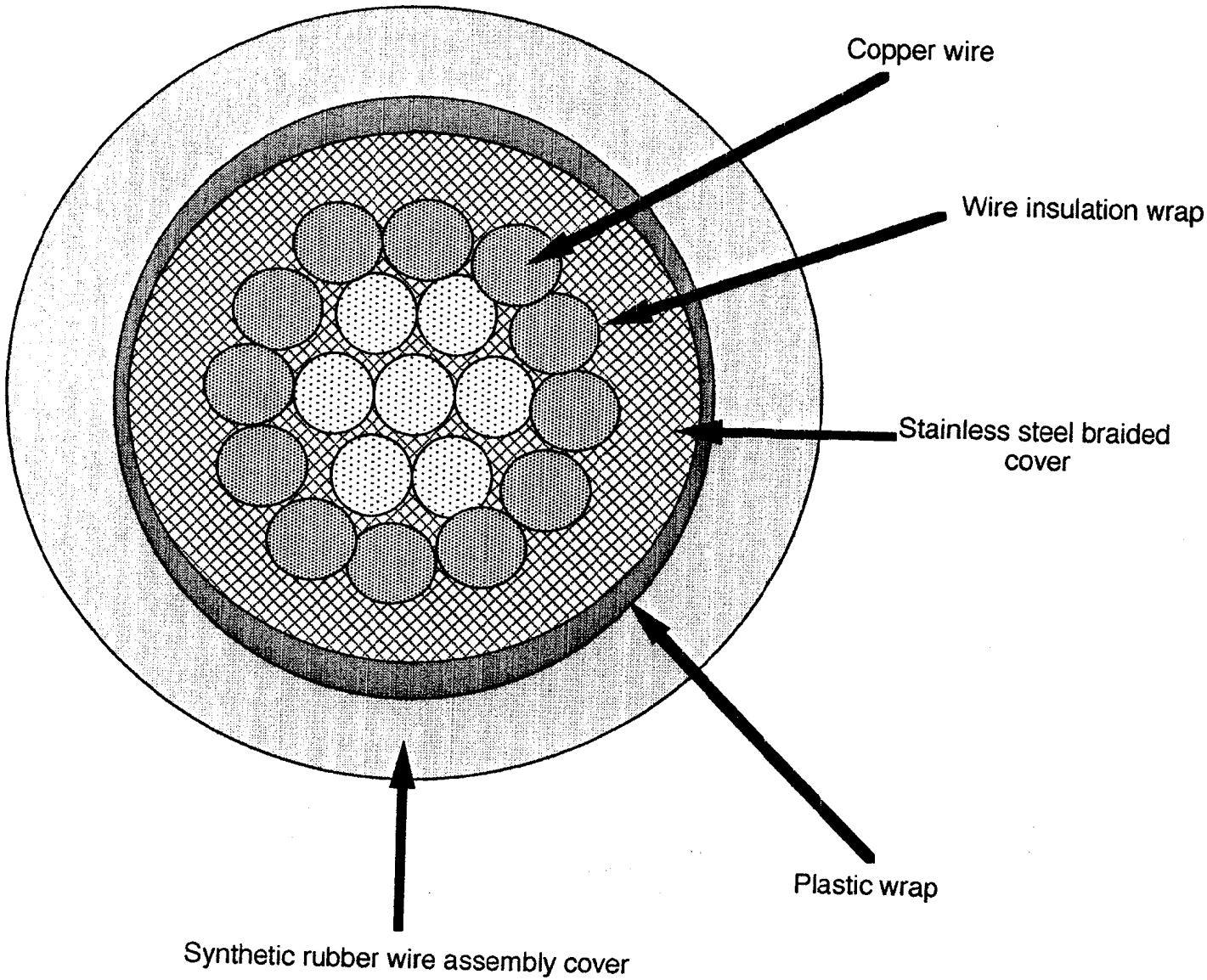
Cable 319161



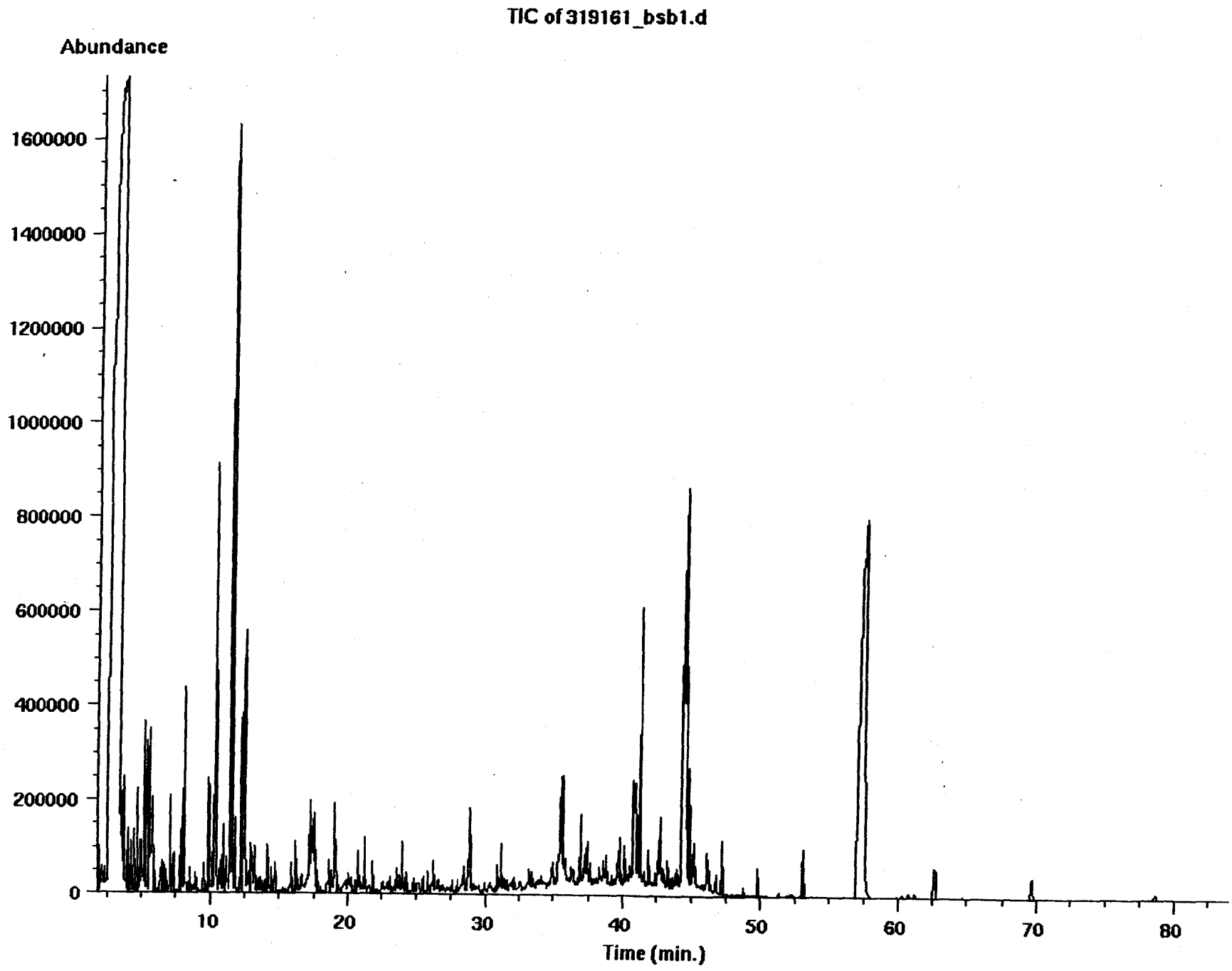
RDL 98

Cable 319161

Material: Neoprene teflon	Retention Time	Carcinogenicity				AMES Mutagenicity	Rat Oral	Irritation Model		Developmental Toxicity	Chronic LOAEL	Amount ng
Chemical Compound	(min.)	Female Mouse	Female Rat	Male Mouse	Male Rat		LD 50	Eye	Skin			
Oxirane,(chloromethyl)	3.6	LOW	HIGH	NO	LOW	YES	237 mg/kg	SEVERE	SEVERE	LOW	124 mg/kg	11
Hexane,1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro	3.8	HIGH	LOW	LOW	HIGH	NO	746 mg/kg	MODERATE	MODERATE	LOW	197 mg/kg	6.132
2-Propenoic acid,6-methylheptyl ester	4.3	LOW	LOW	LOW	HIGH	NO	10 g/kg	MODERATE	MODERATE	LOW	71 mg/kg	10.92
Tolulene	4.7	LOW	HIGH	IND	LOW	NO	3.3 g/kg	MODERATE	MILD	LOW	18.6 mg/kg	6.01
Cyclohexane,1,2-dimethyl-,cis	5.1	HIGH	HIGH	LOW	LOW	NO	2.2 g/kg	MILD	SEVERE	LOW	10.5 mg/kg	8.17
Cyclopentane,1-ethyl-3-methyl-,cis	5.2	LOW	HIGH	LOW	HIGH	NO	9.3 g/kg	CBE	MILD	LOW	70 mg/kg	5.84
4-Octene,(Z)	5.3	LOW	LOW	LOW	LOW	IND	10 g/kg	MODERATE	MODERATE	LOW	675 mg/kg	6
3-Octene,(E)	5.4	LOW	LOW	LOW	LOW	IND	10/g/kg	MODERATE	MODERATE	LOW	408 mg/kg	5.43
2- Octene,(E)	5.5	HIGH	LOW	LOW	LOW	YES	10 g/kg	MODERATE	MODERATE	LOW	408 mg/kg	8.93
Cyclobutane ,2-ethyl-1-methyl-3-propyl	5.6	LOW	HIGH	LOW	LOW	NO	4.8 g/kg	MODERATE	MODERATE	HIGH	18.9 mg/kg	8.9
Benzene,ethyl	7	LOW	LOW	LOW	LOW	NO	4 g/kg	MILD	MILD	IND	43.9 mg/kg	9.05
Benzene,1,3-dimetyyl	7.25	LOW	HIGH	LOW	LOW	LOW	2.5 g/kg	SEVERE	SEVERE	LOW	6.5 mg/kg	8.93
Benzaldehyde	7.8	HIGH	LOW	LOW	LOW	NO	1.3 g/kg	SEVERE	MODERATE	LOW	170 mg/kg	10.36
Hexane,2,2,5,5-tetramethyl	8.1	LOW	LOW	LOW	HIGH	LOW	1.1g/kg	SEVERE	MODERATE	HIGH	1.4 g/kg	13.31
2-Pentanone,3-methyl	9.8	LOW	LOW	LOW	HIGH	NO	2.8g/kg	SEVERE	MODERATE	HIGH	4.7 mg/kg	22.01
1-Heptene,3-methyl	9.82	HIGH	LOW	LOW	HIGH	NO	10g/kg	SEVERE	MODERATE	LOW	8.8 mg/kg	23.91

Cable 319161

Material: Neoprene teflon	Retention Time	Carcinogenicity				AMES Mutagenicity	Rat Oral	Irritation Model		Developmental Toxicity	Chronic LOAEL	Amount ng
Chemical Compound	(min.)	Female Mouse	Female Rat	Male Mouse	Male Rat		LD 50	Eye	Skin			
Benzonitrile	10.8	LOW	LOW	LOW	LOW	NO	250mg/kg	SEVERE	SEVERE	LOW	51 mg/kg	9.95
Heptene,1,1'-oxybis	12.3	LOW	LOW	HIGH	HIGH	NO	10 g/kg	MILD	MILD	LOW	398 mg/kg	41.31
enzene,(1-methyl-1-propenyl)-,(Z)	14	LOW	LOW	LOW	LOW	NO	3.6 g/kg	SEVERE	MODERATE	LOW	49.6 mg/kg	7.85
Benzoic acid	17.1	LOW	HIGH	LOW	LOW	NO	3.0 g/kg	MODERATE	NEGATIVE	LOW	332 mg/kg	6.4
Napthalene	17.2	HIGH	HIGH	LOW	IND	NO	1.8 g/kg	SEVERE	SEVERE	LOW	42 mg/kg	10.24
1,5-Cyclooctadiene,1,6-dichloro	18.9	HIGH	HIGH	LOW	LOW	YES	5.8 g/kg	SEVERE	SEVERE	LOW	21 mg/kg	3.41
Naphthalene,2-methyl	20.6	HIGH	HIGH	LOW	LOW	YES	1.4 g/kg	SEVERE	SEVERE	LOW	67.2 mg/kg	6.68
Naphthalene,1-ethyl	23.4	HIGH	HIGH	LOW	LOW	YES	5 g/kg	SEVERE	SEVERE	HIGH	105 mg/kg	2.36
1-Butyne,3-chloro	23.6	HIGH	LOW	HIGH	LOW	NO	2.4 g/kg	MODERATE	MILD	LOW	24.7 mg/kg	3.82
Ethanamine,2-(dichloromethylsilyl)-N,N-bis(trifluor)	28.3	LOW	HIGH	HIGH	HIGH	NO	10 g/kg	SEVERE	SEVERE	HIGH	576 mg/kg	1.83
Heptanenitrile	28.7	LOW	LOW	LOW	LOW	NO	4.3 g/kg	SEVERE	NEGATIVE	LOW	11.3 mg/kg	8.17
Octane,2,6-dimethyl	30.8	HIGH	LOW	LOW	HIGH	NO	10 g/kg	SEVERE	MODERATE	LOW	60.5 mg/kg	3.03
1,4-Benzenedicarboxylic acid	35.2	LOW	HIGH	LOW	LOW	NO	2 g/kg	SEVERE	MILD	LOW	1.4 g/kg	2.3
1,3-Benzenedicarboxylic acid	35.6	LOW	HIGH	LOW	LOW	NO	2.1 g/kg	SEVERE	MODERATE	LOW	381 mg/kg	8.76
Hexadecanoic acid	36.8	LOW	LOW	LOW	HIGH	NO	3.4 g/kg	SEVERE	MODERATE	LOW	848 mg/kg	9.08
8-Quinolinol,2-methyl	37.2	LOW	HIGH	LOW	LOW	YES	2 g/kg	SEVERE	SEVERE	LOW	70 mg/kg	2.77
Naphthalene,1,2,3,4-tetrahydro-1,6-dimethyl	37.5	HIGH	HIGH	LOW	IND	YES	3.2 g/kg	SEVERE	SEVERE	LOW	26 mg/kg	4.55
Benzaldehyde,4-nitro-,oxime	40.7	IND	HIGH	LOW	HIGH	NO	16.5 g/kg	SEVERE	SEVERE	LOW	31 mg/kg	8.81
Acetic acid,[m-(trimethylsiloxy)phenyl]-,mei	41.1	LOW	LOW	LOW	HIGH	NO	10 g/kg	MODERATE	MILD	HIGH	184 mg/kg	31.47
2-Undecene,9-methyl-,(E)	42.7	HIGH	LOW	LOW	LOW	YES	10 g/kg	SEVERE	MODERATE	LOW	6.2 mg/kg	11.41
7-Hexadecyne	44.2	LOW	LOW	LOW	HIGH	NO	10 g/kg	NEGATIVE	MODERATE	LOW	900 mg/kg	14.74
Oxirane,2,3-bis(1-methylethyl)-trans	44.8	LOW	LOW	LOW	HIGH	YES	3.5 g/kg	MODERATE	MILD	HIGH	31 mg/kg	29.69
Undecane,5-ethyl-5-propyl	49.9	LOW	LOW	LOW	LOW	IND	10 g/kg	MODERATE	SEVERE	LOW	253 mg/kg	3.09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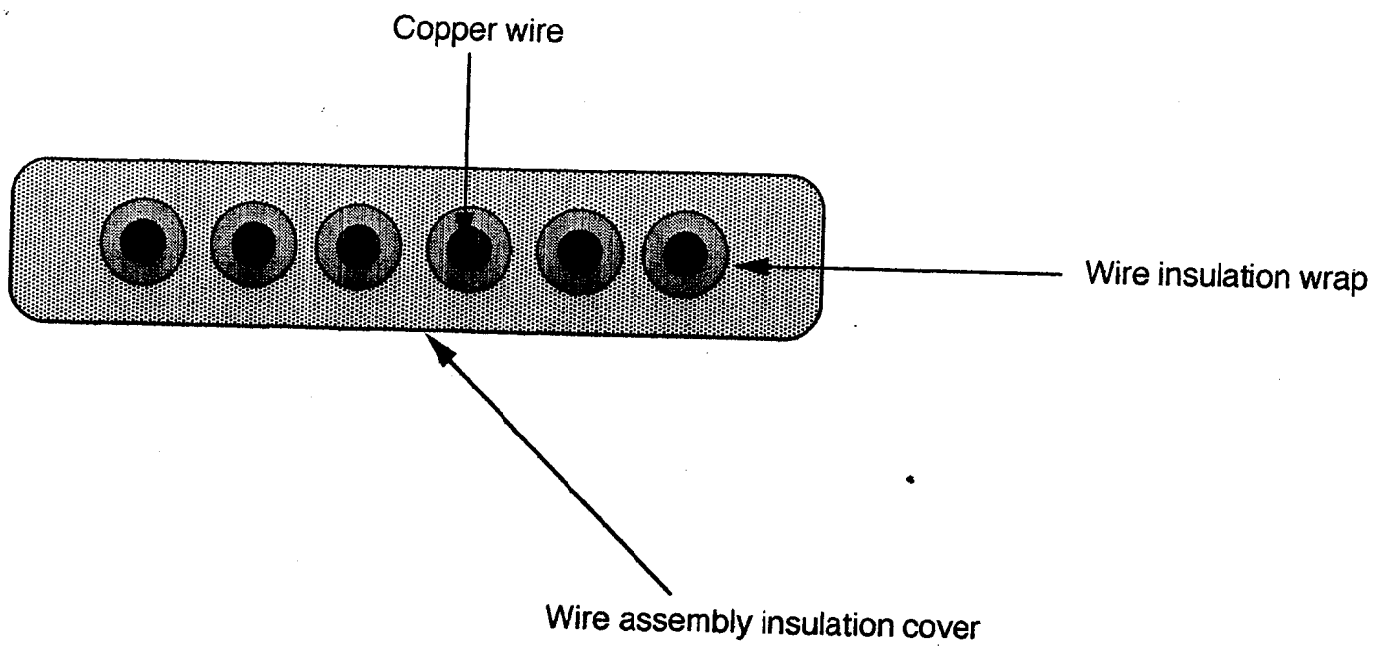
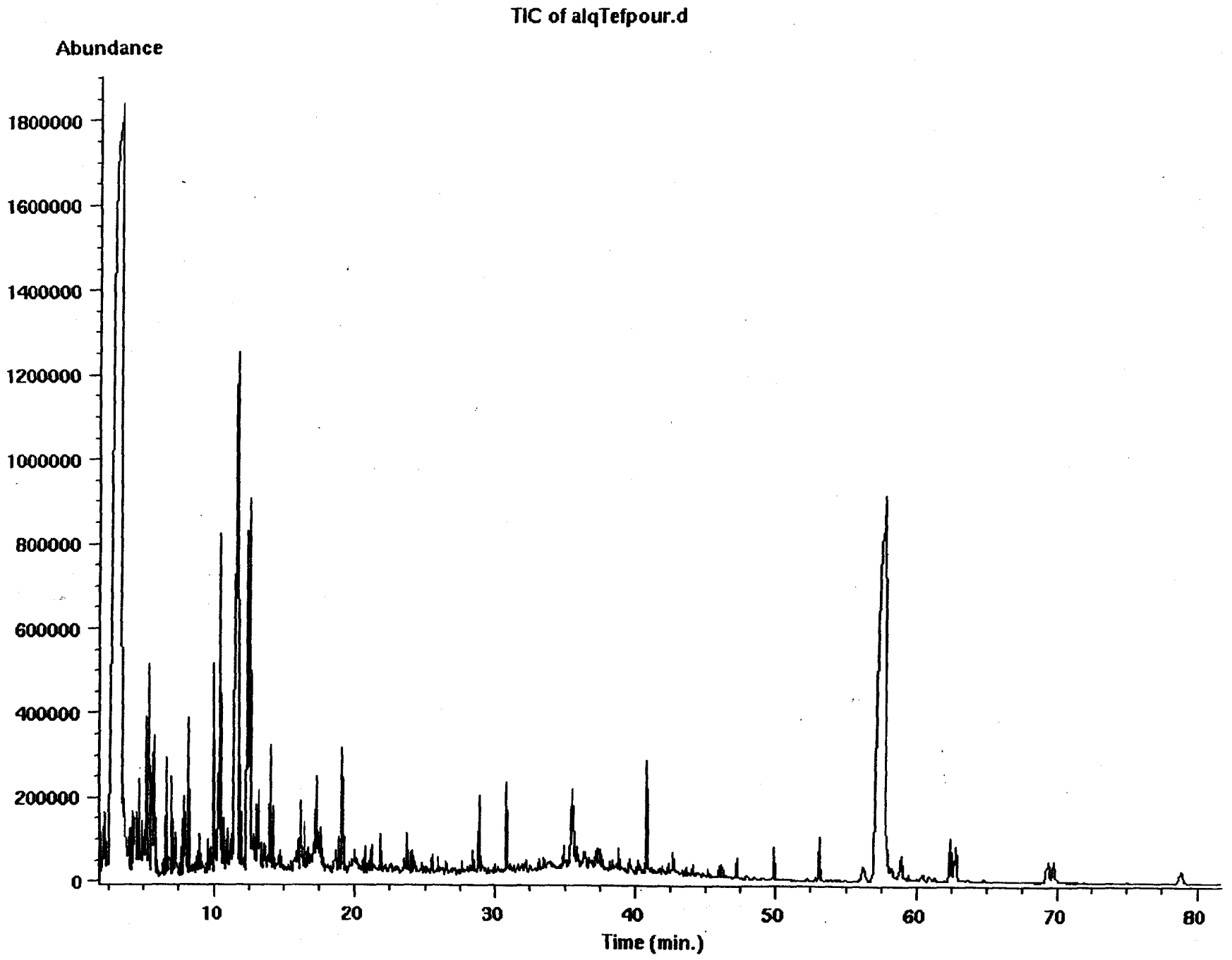


Cable 357566

Material: teflon polyurethane	Retention Time	Carcinogenicity				AMES Mutagenicity	Rat Oral	Irritation Model		Developmental Toxicity	Chronic LOAEL	Amount ng
Chemical Compound	(min.)	Female Mouse	Female Rat	Male Mouse	Male Rat		LD 50	Eye	Skin			
Ethane,1,2 - dichloro	3.1	LOW	HIGH	HIGH	HIGH	YES	119.5 mg/kg	SEVERE	SEVERE	HIGH	84.6 mg/kg	
Propane ,1,1,2- trichloro	4.1	HIGH	HIGH	HIGH	LOW	YES	544 mg/kg	SEVERE	SEVERE	LOW	87 mg/kg	
Ethene , tetrachloro	4.8	LOW	HIGH	HIGH	LOW	YES	1.5 g/kg	SEVERE	MODERATE	LOW	193 mg/kg	
Propanoic , 2,2-dimethyl-,chloromethyl ester	7.4	LOW	IND	HIGH	HIGH	YES	669 mg/kg	MODERATE	MODERATE	HIGH	79 mg/kg	
Ether , butyl isopentyl	7.5	LOW	LOW	LOW	HIGH	NO	7.3 g/kg	MODERATE	MODERATE	LOW	10.6 mg/kg	
Ethenamine,N-nitroso	8.4	HIGH	LOW	LOW	HIGH	YES	52 mg/kg	MODERATE	MODERATE	LOW	2.4 mg/kg	
1,3 -Dioxolan -2 -one ,4,5-dimethyl	10.4	LOW	LOW	HIGH	LOW	YES	1.9 g/kg	MODERATE	MODERATE	HIGH	226 mg/kg	
Cyclopropane , 1- propenyl	11.1	IND	LOW	IND	LOW	NO	2.1 g/kg	SEVERE	SEVERE	LOW	153 mg/kg	
Furan , 2-butyltrahydro-	13.3	LOW	HIGH	LOW	IND	YES	1.3 g/kg	MODERATE	MODERATE	LOW	598 mg/kg	
Heptane ,2,6-dimethyl	13.6	HIGH	LOW	LOW	LOW	NO	8.2 g/kg	MODERATE	MODERATE	HIGH	1.2 g/kg	
1- Butanol , 4-butoxy	15.7	LOW	LOW	LOW	IND	YES	3.9 g/kg	MODERATE	MODERATE	LOW	1.3 g/kg	
2 - Butene , 1-propoxy	16.1	HIGH	LOW	LOW	LOW	YES	4.3 g/kg	MODERATE	MODERATE	LOW	464 mg/kg	
Oxirane , butyl	16.3	LOW	HIGH	LOW	IND	YES	836 mg/kg	SEVERE	SEVERE	LOW	850 mg/kg	
Naphthalene	17.2	HIGH	HIGH	LOW	LOW	NO	1.8 g/kg	SEVERE	MODERATE	LOW	42 mg/kg	
Furan , tetrahydro - 2- methyl	19.4	LOW	HIGH	HIGH	IND	YES	765 mg/kg	MODERATE	MODERATE	HIGH	290 mg/kg	

Cable 357566

Material: teflon polyurethane Chemical Compound	Retention Time (min.)	Carcinogenicity Female Mouse	Carcinogenicity Female Rat	Carcinogenicity Male Mouse	Carcinogenicity Male Rat	AMES Mutagenicity	Rat Oral LD 50	Irritation Model Eye	Irritation Model Skin	Developmental Toxicity	Chronic LOAEL	Amount ng
Octane ,2,6- dimethyl	21.9	HIGH	LOW	LOW	HIGH	NO	7.2 g/kg	MODERATE	MODERATE	LOW	60 mg/kg	
Benzene , 2,4-disocyanato -1-methyl	22.1	LOW	LOW	LOW	HIGH	YES	3.6 g/kg	SEVERE	MODERATE	LOW	214 mg/kg	
2 - Furanmethanol , tetrahydro	23.3	LOW	IND	HIGH	HIGH	NO	1.9 g/kg	SEVERE	MODERATE	LOW	23.7 mg/kg	
1- Hepten -4-ol	24.1	HIGH	LOW	LOW	LOW	NO	2.6 g/kg	MILD	MILD	LOW	339 mg/kg	
Furan , 2-butyltetrahydro	25.7	LOW	HIGH	LOW	IND	YES	1.3 g/kg	SEVERE	MODERATE	LOW	598 mg/kg	
Butanoic acid , pentyl ester	26.4	LOW	LOW	LOW	HIGH	NO	2.6 g/kg	MODERATE	MODERATE	LOW	452 mg/kg	
Octane,2,6,6-trimethyl	27.3	LOW	LOW	LOW	HIGH	NO	5.3 g/kg	SEVERE	SEVERE	LOW	7.1 mg/kg	
Oxirane ,2,2-[1,4-butanediyltbis(oxymethylene)]	29	HIGH	HIGH	LOW	IND	YES	2.7 g/kg	SEVERE	SEVERE	LOW	1.6 g/kg	
2- Propenoic acid , ethenyl ester	34.7	HIGH	LOW	LOW	LOW	YES	3.2 g/kg	MODERATE	MODERATE	LOW	5.9 mg/kg	
1 , 5- Heptadiene - 3,4-diol	36.9	IND	LOW	LOW	IND	YES	160 mg/kg	MODERATE	MODERATE	LOW	203 mg/kg	
Propanoic acid,2-methyl-2,2-dimethyl	37	LOW	LOW	LOW	IND	NO	9.2 g/kg	SEVERE	MODERATE	LOW	5.5 g/kg	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Abundance
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1400000
1200000
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800000
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10
20
30
40
50
60
70
80
Time (min.)