

EPA-450/3-77-008e

October 1976

**PRELIMINARY SCORING
OF SELECTED ORGANIC
AIR POLLUTANTS
APPENDIX IV -
CHEMISTRY, PRODUCTION,
AND TOXICITY
OF CHEMICALS
O THROUGH Z**



**U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Waste Management
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711**

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AND TOXICITY
OF CHEMICALS
O THROUGH Z**

by

J. Dorigan, B. Fuller and R. Duffy

**The Mitre Corporation
Metrek Division
Westgate Research Park
McLean, Virginia 22101**

Contract No. 68-02-1495

Project No. 077L

EPA Project Officer: David R. Patrick

Prepared for

**ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Waste Management
Office of Air Quality Planning and Standards
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PREFACE

A program is being developed by the Emission Standards and Engineering Division of the U.S. Environmental Protection Agency to determine the extent and environmental effects of atmospheric industrial emissions of synthetic organic chemicals. As part of the initial effort, EPA requested that the MITRE Corporation, METREK Division, devise a system for identifying those chemicals that may be released to the atmosphere from chemical manufacturing plants and whose health effects have been documented. To address this need, three general categories of information for each compound to be evaluated were deemed directly relevant:

- (1) the quantity of the compound produced;
- (2) the potential for atmospheric release from chemical manufacturing plants, and
- (3) the toxicological effects of the compounds.

The results of this study are presented in the accompanying report "Preliminary Scoring of Organic Air Pollutants."

The following dossiers were prepared for each of the 637 compounds under consideration in an attempt to collate the pertinent data for subsequent evaluation.

TABLE OF CONTENTS

	<u>Page</u>
Octyl alcohol	AIV-2
Octyl decyl phthalate	AIV-4
Octylphenol	AIV-6
Oxalic acid	AIV-8
Paraldehyde	AIV-10
Paraquat	AIV-12
PCNB	AIV-14
PCP	AIV-16
Pentaerythritol	AIV-18
Pentane	AIV-20
Pentylene	AIV-22
Perchloroethylene	AIV-24
Perchloromethyl mercaptan	AIV-26
o-Phenetidine	AIV-28
p-Phenetidine	AIV-30
Phenol	AIV-32
Phenothiazine	AIV-34
o-Phenylenediamine	AIV-36
p-Phenylenediamine	AIV-38
Phenylhydrazine	AIV-40
Phosgene	AIV-42
Phthalic anhydride	AIV-44
Phthalimide	AIV-46
Phthalonitrile	AIV-48
Picloram	AIV-50
β -Picoline	AIV-52
α, β -Pinene	AIV-54
Piperazine	AIV-56
Piperonyl butoxide	AIV-58
Planavin	AIV-60
Polacrylamide	AIV-62
Polybutenes	AIV-64
Polychlorinated biphenyl	AIV-66
Polyethylene and co-polymers	AIV-68
Polyethylene glycols	AIV-70
Polyethylene glycol chloride	AIV-72
Polyethylene terephthalate	AIV-74
Polypropylene	AIV-76
Polypropylene glycol	AIV-78
Polystyrene	AIV-80
Polystyrene, thermoplastic resins	AIV-82
Polytetrafluoroethylene	AIV-84
Polyvinyl alcohol	AIV-86
Polyvinyl chloride	AIV-88

TABLE OF CONTENTS (Continued)

	<u>Page</u>
Princep	AIV-90
Propachlor	AIV-92
Propane	AIV-94
Propanil	AIV-96
Propargyl alcohol	AIV-98
Propazine	AIV-100
Propiolactone	AIV-102
Propionaldehyde	AIV-104
Propionic acid	AIV-106
Propyl acetate	AIV-108
Propyl alcohol	AIV-110
Propylamine	AIV-112
Propyl chloride	AIV-114
Propylene	AIV-116
Propylene chlorohydrin	AIV-118
Propylene glycol	AIV-120
Propyleneimine	AIV-122
Propylene oxide	AIV-124
Pyridine	AIV-126
Radox	AIV-128
Resorcinol	AIV-130
Ronnel	AIV-132
Ruelene	AIV-134
Salicylic acid	AIV-136
Silvex	AIV-138
Sodium acetate	AIV-140
Sodium benzoate	AIV-142
Sodium carboxymethylcellulose	AIV-144
Sodium chloroacetate	AIV-146
Sodium formate	AIV-148
Sodium phenate	AIV-150
Sorbic acid	AIV-152
Sorbitol	AIV-154
Styrene monomer	AIV-156
Succinic acid	AIV-158
Succinonitrile	AIV-160
Sulfanilic acid	AIV-162
Sulfolane	AIV-164
Sulfosuccinic, bis (2-ethylhexyl) ester, sodium salt	AIV-166
Sutan	AIV-168
TBA	AIV-170
TCA	AIV-172
Terephthalic acid	AIV-174
Termik	AIV-176
1,1,1,2-Tetrachloro-2,2-difluoroethane	AIV-178

TABLE OF CONTENTS (Continued)

	<u>Page</u>
1,1,2,2-Tetrachloro-1,2-difluoroethane	AIV-180
Tetrachloronaphthalene	AIV-182
Tetrachlorophthalic anhydride	AIV-184
Tetraethyl lead	AIV-186
Tetrahydrofuran	AIV-188
Tetrahydronaphthalene	AIV-190
Tetrahydrophthalic anhydride	AIV-192
Tetramethylethylenediamine	AIV-194
Tetramethyl lead	AIV-196
Tetramethyl succinonitrile	AIV-198
Tetranitromethane	AIV-200
Tetrapropylene	AIV-202
Tetryl	AIV-204
Thiuram	AIV-206
o-Tolidine	AIV-208
Toluene	AIV-210
Toluene-2,4-diamine	AIV-212
Toluene diisocyanate	AIV-214
Toluenesulfonamide	AIV-216
o-Toluenesulfonic acid	AIV-218
p-Toluenesulfonic acid	AIV-220
Toluenesulfonyl chloride	AIV-222
m-Toluidine	AIV-224
o-Toluidine	AIV-226
p-Toluidine	AIV-228
Toxaphene	AIV-230
Tributyl phosphate	AIV-232
Trichloroaniline	AIV-234
Trichlorobenzene	AIV-236
1,1,1-Trichloroethane	AIV-238
1,1,2-Trichloroethane	AIV-240
Trichloroethylene	AIV-242
Trichlorofluoromethane	AIV-244
Trichloroisocyanuric acid	AIV-246
Trichloronaphthalene	AIV-248
Trichlorophenoxyacetic acid	AIV-250
Trichloropropane	AIV-252
Trichlorotrifluoroethane	AIV-254
Tricresyl phosphate	AIV-256
Tridecylbenzenesulfonic acid, sodium salt	AIV-258
Triethanolamine	AIV-260

TABLE OF CONTENTS (Concluded)

	<u>Page</u>
Triethylamine	AIV-262
Triethylene glycol	AIV-264
Triethylene glycol, dimethyl ether	AIV-266
Triethylene glycol, monomethyl ether	AIV-268
Trifluralin	AIV-270
Triisobutylene	AIV-272
Trimethylamine	AIV-274
Trimethylpentanediol	AIV-276
Trinitrotoluene	AIV-278
Trithion	AIV-280
Urea	AIV-282
Vernam	AIV-284
Vinyl acetate	AIV-286
Vinyl chloride	AIV-288
Vinylidene chloride	AIV-290
Vinyltoluene	AIV-292
Warfarin	AIV-294
m-Xylene	AIV-296
o-Xylene	AIV-298
p-Xylene	AIV-300
Xylenesulfonic acid, sodium salt	AIV-302
2,6-Xylenol	AIV-304
3,5-Xylenol	AIV-306
Zinc stearate	AIV-308
Chemical Name Index	AIV-310

APPENDIX IV

CHEMISTRY, PRODUCTION AND TOXICITY OF SELECTED
SYNTHETIC ORGANIC CHEMICALS

Octyl alcohol

CHEMICAL NAME

CAS Number: 1341-41-9

Chemical Name: Isooctyl alcohol

Synonyms: 2-Ethylhexyl alcohol
2-Ethyl-1-hexanol

Molecular

Formula: C₈H₁₈O

Structure:
$$\begin{array}{ccccccc} \text{CH}_2 & - & \text{CH}_2 & - & \text{CH}_2 & - & \text{CH}_2 & - & \text{CH} & - & \text{CH}_2\text{OH} \\ & & & & & & | & & \text{CH}_2 & & \\ & & & & & & | & & \text{CH}_3 & & \end{array}$$

Chemical Properties

Molecular Weight: 130.23

Physical State: Liquid

Vapor Pressure: 0.2 mm at 20°C

Vapor Density: 4.49

Boiling Point: 185°C

Melting Point: -76°C

Density: 0.8328 at 20°C/4°C

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD: 37% of theoretical

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—moderate

Octyl alcohol

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr): 15.8

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
1480 mg/kg

Animal
rat

Route
oral

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Octyl decyl phthalate

CHEMICAL NAME

CAS Number: 119-07-3

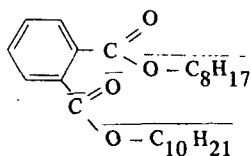
Chemical Name: Phthalic acid, decyl octyl ester

Synonyms: n-Octyl-n-decyl phthalate
Decyl octyl ester of phthalic acid

Molecular

Formula: $C_{26}H_{42}O_4$

Structure:



Chemical Properties

Molecular Weight: 418.6

Physical State: Liquid

Vapor Pressure: Negligible at 25°C

Vapor Density:

Boiling Point: 239°C at 4 mm

Melting Point: -40°C

Density: 0.980 at 20°C/20°C

Solubility:

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—slight

Octyl decyl phthalate

PRODUCTION DATA

Annual U.S.
Production: 200×10^6 lbs.

Consumption: 200×10^6 lbs.

Fraction of
Dispersion: 1.0

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 203.0

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Octylphenol

CHEMICAL NAME

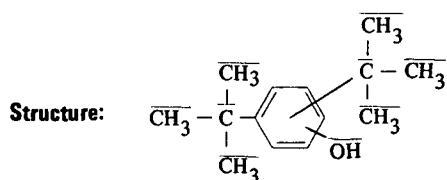
CAS Number: 27193-28-8

Chemical Name: Octylphenol

Synonyms: Diisobutylphenol

Molecular

Formula: $C_{14}H_{22}O$



Chemical Properties

Molecular Weight: 206.36

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: 280 to 283°C

Melting Point:

Density: 0.941 at 24°C/4°C

Solubility: Insoluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—slight

Disaster hazard—dangerous—toxic fumes—phenol

Octylphenol

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
LD_{Lo}

Dosage
25 mg/kg

Animal
mouse

Route
intraperitoneal

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Oxalic acid

CHEMICAL NAME

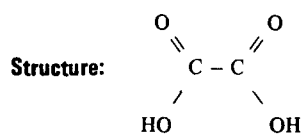
CAS Number: 144-62-7

Chemical Name: Oxalic acid

Synonyms: Ethanedioic acid

Molecular

Formula: $C_2H_2O_4$



Chemical Properties

Molecular Weight: 90.04

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: 150°C (sublimes)

Melting Point: 187°C (anhydrous)

Density: 1.653 (hydrate)

Solubility: Soluble (H_2O)

Octanol/Water Partition Coefficient: -0.78

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Oxalic acid

PRODUCTION DATA

Annual U.S.**Production:** 18×10^6 lbs. (1974 estimate)**Consumption:****Fraction of
Dispersion:****Fraction of Pro-
duction Lost:** 0.015**Release Rate (million lbs/yr):**

TOXICITY DATA

Acute ToxicityLD_{Lo}**Dosage**700 mg/kg
1000 mg/kg**Animal**human
dog**Route**oral
oral**Non-lethal Acute Effects:**Corrosion of mouth, esophagus and stomach
Kidney and liver damage
Irritation of eyes and upper respiratory tract
Corneal damage**Chronic Toxicity****U.S. Occupational Standard:** (air) TWA 1 mg/m^3 **Carcinogenicity:****Mutagenicity:****Teratogenicity:****TLV:** 1 mg/m^3 **Other Chronic Effects:**

Skin irritation

Paraldehyde

CHEMICAL NAME

CAS Number: 123-63-7

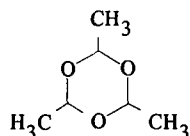
Chemical Name: 2,4,6-Trimethyl-s-trioxane

Synonyms: Paraldehyde
Para-acetaldehyde

Molecular

Formula: C₆H₁₂O₃

Structure:



Chemical Properties

Molecular Weight: 132.18

Physical State: Liquid

Vapor Pressure: 25.3 mm at 20°C

Vapor Density: 4.55

Boiling Point: 124.5°C

Melting Point: 12.6°C

Density: 0.9943 at 20°C/4°C

Solubility: Slightly soluble (H₂O)

Octanol/Water Partition Coefficient: 0.95

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard: Fire—dangerous
Explosion—slight

Paraldehyde

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

LD₅₀

Dosage

3500 mg/kg

Animal

dog

Route

oral

Non-lethal Acute Effects:

Irritation of eyes and mucous membranes

Dermatitis

Psychotropic effects

TD_{Lo}

14 mg/kg

human

oral

14 mg/kg

human

intravenous

71 mg/kg

human

intramuscular

14 mg/kg

human

rectal

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Neoplasm

TD_{Lo}

12 gm/kg for a week

mouse

skin

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Paraquat

CHEMICAL NAME

CAS Number: 1910-42-5

Chemical Name: 1,1'-Dimethyl-4,4'-bipyridium dichloride

Synonyms: Paraquat
1,1'-Dimethyl-4,4'-dipyridium salt

Molecular Formula: $C_{12}H_{14}N_2 \cdot 2Cl$

Structure: $Cl^{(-)} CH_3^{(+)} - N \text{ (pyridine ring) } - \text{ (benzene ring) } - N - CH_3^{(+)} Cl^{(-)}$

Chemical Properties

Molecular Weight: 257.18

Physical State: Solid

Vapor Pressure: non-volatile

Vapor Density:

Boiling Point: Decomposes

Melting Point:

Density: 1.24 to 1.26 at 20°C/20°C

Solubility: Infinite

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:
Susceptible to ultraviolet decomposition

Safety Hazard:

Paraquat

PRODUCTION DATA

Annual U.S.
Production: (O, through 1976)

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	57 mg/kg	rat	oral
	80 mg/kg	rat	oral
	50 mg/kg	monkey	oral
	22 mg/kg	guinea pig	oral
LD _{Lo}	236 mg/kg	man	oral

Non-lethal Acute Effects:
Lung injury

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TD_{Lo}: 6500 µg/kg (6 days)

Other Chronic Effects:

TLV:

pregnant rat

intraperitoneal

PCNB

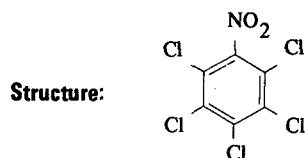
CHEMICAL NAME

CAS Number: 82-68-8

Chemical Name: Pentachloronitrobenzene

Synonyms: PCNB
Quintozene terrachlor
Tritison

Molecular Formula: $C_6Cl_5NO_2$



Chemical Properties

Molecular Weight: 295.32

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: 328°C (some decomposition)

Melting Point: 144°C

Density: 1.718 at 25°C/4°C

Solubility: Practically insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard: Disaster hazard—dangerous—toxic fumes—NO_x and chlorides

PRODUCTION DATA

Annual U.S.
Production: 3×10^6 lbs.

Consumption:

Fraction of
Dispersion: Estimated as 1.0

Fraction of Pro-
duction Lost: 0.01

Release Rate (million lbs/yr): 3.0

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
1650 mg/kg
1650 mg/kg

Animal
rat
mammal

Route
oral
unreported

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:
TD_{Lo}

135 gm/kg (77 weeks) mouse

oral

Neoplastic effects:
TD_{Lo}

576 mg/kg (12 weeks) mouse

skin

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

PCP

CHEMICAL NAME

CAS Number: 87-86-5

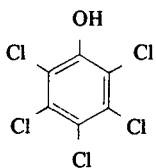
Chemical Name: Pentachlorophenol

Synonyms: PCP (and salts)

Molecular

Formula: C_6HCl_5O

Structure:



Chemical Properties

Molecular Weight: 266.32

Physical State: Solid

Vapor Pressure: 40 mm at 211.2°C

Vapor Density:

Boiling Point: 310°C (decomposes) at 759 mm

Melting Point: 174°C

Density: 1.978 at 22°C/4°C

Solubility: Slightly soluble

Octanol/Water Partition Coefficient: 5.01

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard: Disaster hazard—dangerous—toxic fumes—chlorides

PRODUCTION DATA**Annual U.S.****Production:** 46.0×10^6 lbs. (1969 capacity)**Consumption:** 50.0×10^6 lbs. (1975)**Fraction of
Dispersion:****Fraction of Pro-
duction Lost:** 0.015**Release Rate (million lbs/yr):****TOXICITY DATA****Acute Toxicity****LD₅₀****Dosage**

27 mg/kg

105 mg/kg

56 mg/kg

100 mg/kg

29 mg/kg

Animal

rat

rat

rat

rat

human

Route

oral

skin

intraperitoneal

subcutaneous

oral

TD_{Lo}**Non-lethal Acute Effects:**

Irritation of skin, eyes, and mucous membranes

Nausea and vomiting

Chronic Toxicity**U.S. Occupational Standard:** (air) TWA $500 \mu\text{g}/\text{m}^3$ **Carcinogenicity:**

May be associated with cancer

Mutagenicity:

Mutagen in laboratory

Teratogenicity:**TLV:** $500 \mu\text{g}/\text{m}^3$ **Other Chronic Effects:**

Pentaerythritol

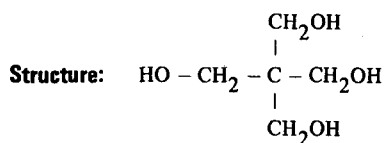
CHEMICAL NAME

CAS Number: 115-77-5

Chemical Name: 2,2-bis(Hydroxymethyl)-1,3-propanediol

Synonyms: Pentek PE 200 Pentaerythrite
Penetek Monopentaerythritol
Tetramethylol Tetrahydroxymethylmethane

Molecular Formula: $C_5H_{12}O_4$



Chemical Properties

Molecular Weight: 136.1

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: 276°C at 30 mm (sublimes)

Melting Point: 262°C

Density: 1.399 at 25°C/4°C

Solubility: Soluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—moderate

Pentaerythritol

PRODUCTION DATA

Annual U.S.**Production:** 100.4×10^6 lbs. (1975)**Consumption:** 89×10^6 lbs. (1975)**Fraction of
Dispersion:****Fraction of Pro-
duction Lost:**

0.015

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity**Dosage****Animal****Route****Chronic Toxicity****U.S. Occupational Standard:****Carcinogenicity:****Mutagenicity:****Teratogenicity:****TLV:****Other Chronic Effects:**

Pentane

CHEMICAL NAME

CAS Number: 109-66-0

Chemical Name: Pentane

Synonyms: Amylhydride

Molecular

Formula: C_5H_{12}

Structure: $CH_3CH_2CH_2CH_2CH_3$

Chemical Properties

Molecular Weight: 72.15

Physical State: Liquid

Vapor Pressure: 400 mm at 18.5°C

Vapor Density: 2.48

Boiling Point: 36.1°C

Melting Point: -129.72°C

Density: 0.626 at 20°C/4°C

Solubility: Slightly soluble (0.03 gm/100 ml H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard: Fire—very dangerous
Explosion—severe

Pentane

PRODUCTION DATA

Annual U.S. Production: 478×10^6 lbs. (1964) (all pentanes) **Consumption:**

Fraction of Dispersion: **Fraction of Production Lost:** 0.015

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
----------------	--------	--------	-------

Non-lethal Acute Effects:

Narcotic in high concentrations

CNS effects

TC_{Lo} 130,000 ppm

Irritation of eyes and respiratory tract

human

inhalation

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 1000 ppm

Carcinogenicity: Carcinogen

Mutagenicity:

Teratogenicity:

TLV: 1000 ppm

Other Chronic Effects:

Pentylene

CHEMICAL NAME

CAS Number: 513-35-9

Chemical Name: 2-Methyl-2-butene

Synonyms: Amylenes (mixed)
Trimethylethylene
3-Methyl-2-butene

**Molecular
Formula:** C₅H₁₀

Structure:
$$\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 - \text{C} = \text{CH} - \text{CH}_3 \end{array}$$

Chemical Properties

Molecular Weight: 70.14

Physical State: Liquid

Vapor Pressure:

Vapor Density:

Boiling Point: 38.57°C at 760 mm

Melting Point: -133.77°C

Density: 0.6623 at 20°C/4°C

Solubility: Insoluble (H₂O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—dangerous

Pentylene

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Moderate effects from ingestion or inhalation

Perchloroethylene

CHEMICAL NAME

CAS Number: 127-18-4

Chemical Name: Tetrachloroethylene

Synonyms: Perchloroethylene Carbondichloride
Ethylene tetrachloride Tetrachloroethene

Molecular

Formula: C_2Cl_4

Structure:

Chemical Properties

Molecular Weight: 165.82

Physical State: Liquid

Vapor Pressure: 18.47 mm at 25°C

Vapor Density: 5.83

Boiling Point: 121.20°C at 760 mm

Melting Point: -19°C

Density: 1.6227 at 20°C/4°C

Solubility: Insoluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Activity: RO_2 $t_{1/2}$ = 220 years

O_3 $t_{1/2}$ = 11 years

OH: $t_{1/2}$ = 8 days

Photochemical Degradation: Not photoreactive

Safety Hazard: Disaster hazard—dangerous—toxic fumes—chlorides

Perchloroethylene

PRODUCTION DATA

Annual U.S. Production: 673.7×10^6 lbs. (1975) **Consumption:** 515 to 575×10^6 lbs. (1975 estimate)

Fraction of Dispersion: 0.89 **Fraction of Production Lost:** 0.015

Release Rate (million lbs/yr): 688.0

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD _{Lo}	2200 mg/kg	rabbit	subcutaneous
	5000 mg/kg	rabbit	oral
	4000 mg/kg	cat	oral
	85 mg/kg	dog	intravenous
	4000 mg/kg	dog	oral
LC _{Lo}	4000 ppm (4 hours)	rat	inhalation

Non-lethal Acute Effects:

TC _{Lo}	600 ppm (10 min)	man—inhalation—central nervous systems effects
	280 ppm (2 hours)	man—inhalation—eye irritant
	230 ppm	human—inhalation—systemic effects

Local irritant; lachrymation; irritation of nose and throat; vomiting, nausea; drowsiness; attitude of irresponsibility; anesthetic; headache; dermatitis; irritation of gastrointestinal tract following ingestion.

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 100 ppm
continuous 200 ppm
peak 300 ppm for 5 minutes in 3 hours

Carcinogenicity:
Not carcinogenic according to Dow Chemical Co.

Mutagenicity:

Teratogenicity: **TLV:**

Other Chronic Effects:

Perchloromethyl mercaptan

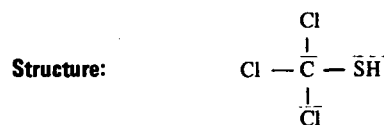
CHEMICAL NAME

CAS Number: 75-70-7

Chemical Name: Trichloromethanethiol

Synonyms: Perchloromethyl mercaptan Trichloromethyl mercaptan

**Molecular
Formula:** CHCl_3S



Chemical Properties

Molecular Weight: 151.43

Physical State: Liquid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point:

Density:

Solubility:

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—dangerous—toxic fumes—chlorides

Perchloromethyl mercaptan

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	83 mg/kg	rat	oral
LC _{Lo}	483 ppm (10 minutes)	human	inhalation
	58 ppm (10 minutes)	mouse	inhalation
	58 ppm (15 minutes)	cat	inhalation

Non-lethal Acute Effects:

Eye			
TC _{Lo}	45 ppm	human	inhalation
Irritation of respiratory tract			

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 800 mg/m³

Carcinogenicity:

Mutagenicity:			
TC _{Lo}	15 mg/m ³ (68 weeks)	rat	inhalation
Teratogenicity:		TLV:	

Other Chronic Effects:

o-Phenetidine

CHEMICAL NAME

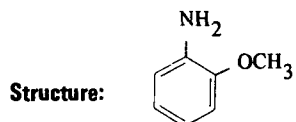
CAS Number: 94-70-2

Chemical Name: o-Phenetidine

Synonyms: 2-Aminophenetole
2-Ethoxyaniline

Molecular

Formula: $C_8H_{11}NO$



Chemical Properties

Molecular Weight: 137.2

Physical State: Liquid

Vapor Pressure: 1 mm at 67°C

Vapor Density:

Boiling Point: 232.5°C at 760 mm

Melting Point: -20°C

Density:

Solubility: Slightly (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard: Disaster hazard—dangerous—toxic fumes— NO_x

o-Phenetidine

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Sublethal acute effects:

Highly toxic
Palpitation
Dyspnea
Cyanosis

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity: Recognized carcinogen

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

p-Phenetidine

CHEMICAL NAME

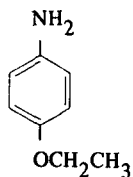
CAS Number: 156-43-4

Chemical Name: p-Phenetidine

Synonyms: 4-Ethoxybenzenamine
4-Aminophenetole
4-Ethoxyaniline

Molecular
Formula: $C_8H_{11}NO$

Structure:



Chemical Properties

Molecular Weight: 137.2

Physical State: Liquid

Vapor Pressure: <10 mm at 25°C

Vapor Density: 4.73

Boiling Point: 253 to 255°C

Melting Point: 2 to 4°C

Density: 1.0652 at 16°C/4°C

Solubility: Slightly soluble (H_2O)

Octanol/Water Parti-
tion Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard: Disaster hazard—dangerous—toxic fumes— NO_x

p-Phenetidine

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity: Recognized carcinogen

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Phenol

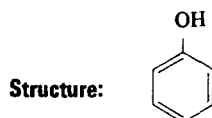
CHEMICAL NAME

CAS Number: 108-95-2

Chemical Name: Phenol

Synonyms: Carbolic acid Oxybenzene
Phenic acid Phenyl hydroxide
Phenylic acid Hydroxybenzene

Molecular Formula: C₆H₆O



Chemical Properties

Molecular Weight: 94.11

Physical State: Solid

Vapor Pressure: 0.530 mm at 25°C
1 mm at 40°C

Vapor Density: 3.24

Boiling Point: 181.9°C at 760 mm

Melting Point: 42.5 to 43°C

Density: 1.0576 at 20°C/4°C

Solubility: Soluble (86.6 gm/l H₂O)
Infinitely soluble in hot H₂O

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD: 96% of theoretical after 20 days at 20°C
Total theoretical oxygen demand = 2.4 gm/gm

Atmospheric Reactivity:

Activity: reacts with oxidizing materials

RO₂ t_{1/2} = 5 mos.

O₃ t_{1/2} = 9.6 hours

OH t_{1/2} = 1 day

Is rapidly biodegraded to catechol, CH₂, CH₃ and -keto-adipate

Safety Hazard: Fire—moderate
Disaster hazard—dangerous—toxic fumes

Phenol

PRODUCTION DATA

Annual U.S. Production: $2,399 \times 10^6$ lbs. (1974) Consumption: $2,300 \times 10^6$ lbs. (1974 estimate)

Fraction of Dispersion: Fraction of Production Lost: 0.015

Release Rate (million lbs/yr): 47.0

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route	
LD ₅₀	414 mg/kg	rat	oral	
	669 mg/kg	rat	skin	
	250 mg/kg	rat	intraperitoneal	
	344 mg/kg	mouse	subcutaneous	
	300 mg/kg	mouse	oral	
	LD _{Lo}	140 mg/kg	human	oral
		650 mg/kg	rat	subcutaneous
		80 mg/kg	cat	subcutaneous
		50 mg/kg	cat	intravenous
		420 mg/kg	rabbit	oral
2000 mg/kg		rabbit	skin	
620 mg/kg		rabbit	intraperitoneal	
620 mg/kg		rabbit	subcutaneous	
180 mg/kg		rabbit	intravenous	
300 mg/kg		guinea pig	intraperitoneal	
450 mg/kg	guinea pig	subcutaneous		
290 mg/kg	frog	parenteral		

Non-lethal Acute Effects:

Gastrointestinal	14 mg/kg	human	oral
Liver and kidney damage			
Convulsions			
Estrous cycle disturbances			
Decreased brain cortex activity			

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity: TD_{Lo} 4000 mg/kg (20 weeks) mouse skin

Mutagenicity:

Teratogenicity: TLV: 5 ppm

Other Chronic Effects: Nausea and vomiting
Paralysis

Phenothiazine

CHEMICAL NAME

CAS Number: 92-84-2

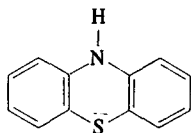
Chemical Name: Phenothiazine

Synonyms: Thiodiphenylamine
Dibenzo-1,4-thiazine

Molecular

Formula: C₁₂H₉NS(tricyclic)

Structure:



Chemical Properties

Molecular Weight: 199.3

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: 371°C at 760 mm

Melting Point: 185.5 to 185.9°C

Density:

Solubility: Slightly (H₂O)

Octanol/Water Partition Coefficient: 4.15

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Phenothiazine

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
5 gm/kg

Animal
rat

Route
oral

Non-lethal Acute Effects:

Hemolytic anemia

Toxic degeneration of liver

Skin irritation and photosensitization

TD_{Lo}

425 mg/kg (5 days)

child

oral

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 5 mg/m³

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 5 mg/m³

Other Chronic Effects:

o-Phenylenediamine

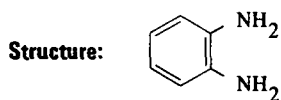
CHEMICAL NAME

CAS Number: 95-54-5

Chemical Name: o-Phenylenediamine

Synonyms: o-Diaminobenzene
1,2-Diamobenzene

**Molecular
Formula:** C₆H₈N₂



Chemical Properties

Molecular Weight: 108.1

Physical State: Solid

Vapor Pressure: Negligible

Vapor Density:

Boiling Point: 257°C at 760 mm

Melting Point: 102 to 103°C

Density:

Solubility: Soluble (hot H₂O)

**Octanol/Water Parti-
tion Coefficient:** 0.37

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard: Fire—slight

o-Phenylenediamine

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

LD_{Lo}

Dosage

600 mg/kg

600 mg/kg

Animal

rat

mouse

Route

subcutaneous

subcutaneous

Non-lethal Acute Effects:

Skin and eye irritant

Liver damage

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 100 $\mu\text{g}/\text{m}^3$ (skin)

Other Chronic Effects:

p-Phenylenediamine

CHEMICAL NAME

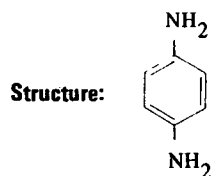
CAS Number: 106-50-3

Chemical Name: p-Phenylenediamine

Synonyms: 1,4-Diaminobenzene
Ursol D

Molecular

Formula: $C_6H_8N_2$



Chemical Properties

Molecular Weight: 108.16

Physical State: Solid

Vapor Pressure: 1 mm at 98.8°C

Vapor Density: 3.72

Boiling Point: 267°C

Melting Point: 140°C

Density: 1.0696 at 58°C/4°C

Solubility: Slightly soluble (H₂O)
Soluble (hot H₂O)

Octanol/Water Partition Coefficient: -0.26

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard: Disaster hazard—dangerous toxic fumes

p-Phenylenediamine

PRODUCTION DATA

Annual U.S.**Production:** 48×10^6 lbs.**Consumption:****Fraction of:****Dispersion:****Fraction of Pro-****duction Lost:** 0.015**Release Rate (million lbs/yr):**

TOXICITY DATA

Acute ToxicityLD_{Lo}**Dosage**

100 mg/kg

50 mg/kg

170 mg/kg

100 mg/kg

17 mg/kg

100 mg/kg

200 mg/kg

17 mg/kg

Animal

rat

rat

rat

dog

dog

cat

rabbit

rabbit

mammal

Route

oral

intraperitoneal

subcutaneous

subcutaneous

intravenous

oral

oral

subcutaneous

intravenous

Non-lethal Acute Effects:

Severe skin and eye irritant

Liver damage

Asthma

Chronic Toxicity**U.S. Occupational Standard:** (air) TWA $100 \mu\text{g}/\text{m}^3$ (skin)**Carcinogenicity:****Mutagenicity:****Teratogenicity:**TLV: $100 \mu\text{g}/\text{m}^3$ **Other Chronic Effects:**

Phenylhydrazine

CHEMICAL NAME

CAS Number: 100-63-0

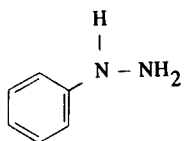
Chemical Name: Phenylhydrazine

Synonyms: Hydrazinobenzene

Molecular

Formula: $C_6H_8N_2$

Structure:



Chemical Properties

Molecular Weight: 108.14

Vapor Pressure: 1 mm at 71.8°C

Boiling Point: 243.5°C at 760 mm

Density: 1.0978 at 20°C/4°C

Octanol/Water Partition Coefficient: 1.25

Physical State: Solid

Vapor Density: 3.7

Melting Point: 19.35°C

Solubility: Very slightly soluble (H₂O)
Soluble in hot H₂O

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Phenylhydrazine

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	188 mg/kg	rat	oral
	80 mg/kg	rabbit	oral
	80 mg/kg	guinea pig	oral
LD _{Lo}	40 mg/kg	rat	subcutaneous
	175 mg/kg	mouse	oral
	170 mg/kg	mouse	subcutaneous
	200 mg/kg	dog	oral
	120 mg/kg	dog	intravenous
	80 mg/kg	rabbit	subcutaneous
	300 mg/kg	frog	unknown

Non-lethal Acute Effects:

Hemolysis of red blood cells
Gastrointestinal disturbances
Dermatitis
Nausea and vomiting

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 5 ppm (skin)

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 5 ppm

Other Chronic Effects: Damage to kidney and liver
Dermatitis

Phosgene

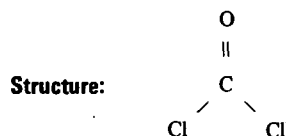
CHEMICAL NAME

CAS Number: 75-44-5

Chemical Name: Phosgene

Synonyms: Carbonoxychloride
Carbonylchloride
CG

**Molecular
Formula:** CCl_2O



Chemical Properties

Molecular Weight: 98.92

Physical State: Gas or volatile liquid

Vapor Pressure: 1428 mm at 25°C

Vapor Density: 3.4

Boiling Point: 7.56°C at 760 mm

Melting Point: -118°C

Density: 1.392 at 19°C/4°C

Solubility: Decomposes in H_2O

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard: Disaster hazard—highly dangerous—toxic fumes

Phosgene

PRODUCTION DATA

Annual U.S.**Production:** 728.2×10^6 lbs. (1973)**Consumption:** $1,066 \times 10^6$ lbs. (1973)**Fraction of
Dispersion:****Fraction of Pro-
duction Lost:** 0.015**Release Rate (million lbs/yr):**

TOXICITY DATA

Acute Toxicity
LC₅₀**Dosage****Animal****Route**

75 ppm (30 months)

rat

inhalation

110 ppm (30 months)

mouse

inhalation

1087 ppm (1 month)

monkey

inhalation

1482 ppm (1 month)

cat

inhalation

3211 ppm (1 month)

rabbit

inhalation

141 ppm (30 months)

guinea pig

inhalation

LC_{Lo}

79 ppm (30 months)

dog

inhalation

LD_{Lo}31 mg/m³ (20 months)

guinea pig

inhalation

Irritant

25 ppm (30 months)

human

inhalation

Non-lethal Acute Effects:

Corneal opacity

Nausea

Chronic Toxicity**U.S. Occupational Standard:****Carcinogenicity:****Mutagenicity:****Teratogenicity:**

TLV: 0.1 ppm

Other Chronic Effects: Pulmonary edema

Phthalic anhydride

CHEMICAL NAME

CAS Number: 85-44-9

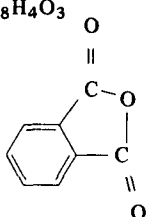
Chemical Name: Phthalic anhydride

Synonyms: Phalandione

Molecular

Formula: $C_8H_4O_3$

Structure:



Chemical Properties

Molecular Weight: 148.12

Vapor Pressure: 1 mm at 96.5°C

Boiling Point: 295.1°C

Density: 1.527 at 4°C

Octanol/Water Partition Coefficient:

Physical State: Solid

Vapor Density: 5.10

Melting Point: 131.61°C

Solubility: Soluble slightly (hot H₂O)

Environmental Persistence

BOD:

Atmospheric Reactivity: (Common air contaminant)
Reacts with oxidizing materials

Safety Hazard: Explosion—moderate

Phthalic anhydride

PRODUCTION DATA

Annual U.S.

Production: 933 x 10⁶ lbs.
(703.7 x 10⁶ lbs. in 1975)

Consumption: 933.7 x 10⁶ lbs.

**Fraction of
Dispersion:** 0

**Fraction of Pro-
duction Lost:** 0.015

Release Rate (million lbs/yr): 14.0

TOXICITY DATA

Acute Toxicity

LD₅₀

Dosage
4020 mg/kg

Animal

rat

Route

oral

LD_{Lo}

800 mg/kg
100 mg/kg

guinea pig
rat

oral
oral

Non-lethal Acute Effects:

Conjunctivitis

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 2 ppm

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 2 ppm

Other Chronic Effects: Emphysema and asthma

Phthalimide

CHEMICAL NAME

CAS Number: 85-41-6

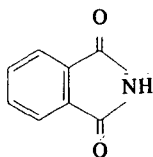
Chemical Name: 1H-Isoindole-1,3(2H)-dione

Synonyms: Phthalimide
1,3-Isoindole-dione
Phthalic acid, imide

Molecular Benzoimide

Formula: $C_8H_5NO_2$

Structure:



Chemical Properties

Molecular Weight: 147.14

Physical State: Solid

Vapor Pressure: < 10 mm at 25°C

Vapor Density:

Boiling Point: 238°C (sublimes)

Melting Point: 238°C

Density:

Solubility: Slightly soluble (H₂O)

Octanol/Water Partition Coefficient: 1.69

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard: Disaster hazard—slight—toxic fumes

Phthalimide

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Phthalonitrile

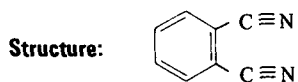
CHEMICAL NAME

CAS Number: 91-15-6

Chemical Name: Phthalonitrile

Synonyms: o-Dicyanobenzene
1,2-Benzene dicarbonitrile

**Molecular
Formula:** $C_8H_4N_2$



Chemical Properties

Molecular Weight: 128.14

Physical State: Solid

Vapor Pressure:

Vapor Density: 4.42

Boiling Point: 187°C (sublimes)

Melting Point: 141°C

Density:

Solubility: Slightly soluble (H_2O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard: Disaster hazard—dangerous—cyanides

Phthalonitrile

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
1860 mg/kg
62 mg/kg
65 mg/kg
35 mg/kg
46 mg/kg

Animal
rat
rat
mouse
mouse
mouse

Route
oral
intraperitoneal
oral
intraperitoneal
subcutaneous

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Picloram

CHEMICAL NAME

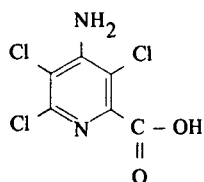
CAS Number: 1918-02-1

Chemical Name: 4-Amino-3,5,6-trichloropicolinic acid

Synonyms: Picloram

**Molecular
Formula:** $C_6H_3Cl_3N_2O_2$

Structure:



Chemical Properties

Molecular Weight: 214.46

Vapor Pressure: 6.16×10^{-7} mm at 35°C

Boiling Point: 215°C (decomposes)

Density:

**Octanol/Water Parti-
tion Coefficient:**

Physical State: Solid

Vapor Density:

Melting Point: 209.5 to 210°C
(decomposes at 215°C)

Solubility: Soluble (H₂O) (430 ppm at 25°C)

Environmental Persistence

BOD:

Atmospheric Reactivity:

Photo decomposition

Safety Hazard:

Picloram

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

LD₅₀

Dosage

3750 mg/kg
1500 mg/kg
2000 mg/kg
2000 mg/kg

Animal

rat
mouse
rabbit
mammal

Route

oral
oral
oral
unknown

Low toxicity to humans

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 10 mg/m³

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

B-Picoline

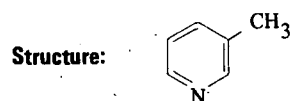
CHEMICAL NAME

CAS Number: 108-99-6

Chemical Name: 3-Picoline

Synonyms: β -Picoline
3-Methylpyridine

**Molecular
Formula:** C_6H_7N



Chemical Properties

Molecular Weight: 93.12

Physical State: Liquid

Vapor Pressure: 10.46 mm at 25°C

Vapor Density: 3.71

Boiling Point: 144.1°C at 760 mm

Melting Point: -18.3°C

Density: 0.9566 at 20°C/4°C

Solubility: Infinite (H_2O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Fire—moderate

Disaster hazard—dangerous—toxic fumes— NO_x

B-Picoline

PRODUCTION DATA

**Annual U.S.
Production:** $>60 \times 10^6$ lbs. (1976)

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:** 0.015

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
-----------------------	---------------	---------------	--------------

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

a, B-Pinene

CHEMICAL NAME

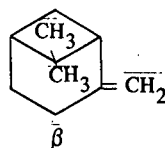
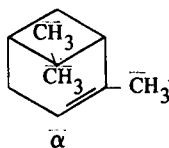
CAS Number: α : 80-56-8 β : 5947-71-7

Chemical Name: α : 2,6,6-Trimethylbicyclo (3.1.1)hept-2-ene
 β : 2,6,6-Trimethylbicyclo (3.1.1) hept-1-ene

Synonyms: α : 2-Pinene β : 3-Pinene
Nopinene
Pseudopinene

Molecular Formula: $C_{10}H_{16}$

Structure:



Chemical Properties

Molecular Weight: 136.24

Physical State: Liquid

Vapor Pressure: 1 mm at 37.3°C (unspecified isomer) **Vapor Density:** 4.7 (unspecified isomer)

Boiling Point: α : 156.1°C at 760 mm
 β : 164 to 166°C at 760 mm

Melting Point: α : -55°C

Density: α : 0.8582 at 20°C/4°C
 β : 0.8654 at 20°C/4°C

Solubility: Insoluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire--moderate

a, B-Pinene

PRODUCTION DATA

Annual U.S.

Production: 120.7 x 10⁶ lbs. (1968)
(isomer not specified)

Consumption:**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:** 0.015

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity**Dosage****Animal****Route****Non-lethal Acute Effects:**

Irritant to skin and mucous membranes
Nephritis

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Piperazine

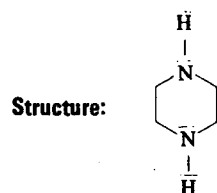
CHEMICAL NAME

CAS Number: 110-85-0

Chemical Name: Piperazine

Synonyms: Hexahydropyrazine
Dimethylenediamine

**Molecular
Formula:** $C_4H_{10}N_2$



Chemical Properties

Molecular Weight: 86.14

Physical State: Solid

Vapor Pressure:

Vapor Density: 3.0

Boiling Point: $146^{\circ}C$ at 760 mm

Melting Point: $106^{\circ}C$

Density: 1.1

Solubility: Very soluble (H_2O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard: Disaster hazard—dangerous—toxic fumes— NO_x

Piperazine

PRODUCTION DATA

Annual U.S.
Production: 4.6×10^6 lbs. (1968)

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
1100 mg/kg

Animal
mouse

Route
subcutaneous

Non-lethal Acute Effects:
Irritant to skin
Blurred vision

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Piperonyl butoxide

CHEMICAL NAME

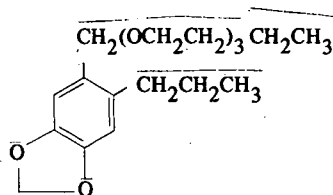
CAS Number: 51-03-6

Chemical Name: α -[2-(2-Butoxyethoxy)ethoxy]-4,5-(methylenedioxy)-2-propyltoluene

Synonyms: Piperonyl butoxide
Butylcarbityl (6-propylpiperonyl) ether
Butacide

Molecular Formula: $C_{19}H_{30}O_5$

Structure:



Chemical Properties

Molecular Weight: 338.4

Physical State: Liquid

Vapor Pressure:

Vapor Density:

Boiling Point: 180°C at 1 mm

Melting Point:

Density: 1.04 to 1.07 at 20°C/20°C

Solubility: Insoluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard: Fire—slight

Piperonyl butoxide

PRODUCTION DATA

Annual U.S.**Production:** 1.0×10^6 lbs.**Consumption:****Fraction of****Dispersion:** Estimated at 1.0**Fraction of Pro-****duction Lost:** 0.015**Release Rate (million lbs/yr):** 1.0

TOXICITY DATA

Acute ToxicityLD₅₀**Dosage**

11500 mg/kg

3800 mg/kg

7500 mg/kg

Animal

rat

mouse

rabbit

Route

oral

oral

oral

Chronic Toxicity**U.S. Occupational Standard:****Carcinogenicity:****Mutagenicity:****Teratogenicity:****TLV:****Other Chronic Effects:**

Planavin

CHEMICAL NAME

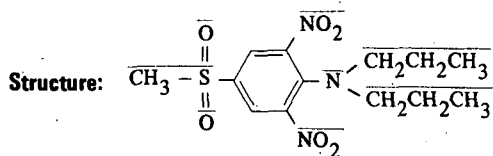
CAS Number: 4726-14-1

Chemical Name: 4-(Methyl sulfonyl)-2,6-dinitro-N,N-dipropylaniline

Synonyms: Planavin

Molecular

Formula: $C_{13}H_{19}N_3O_6S$



Chemical Properties

Molecular Weight: 345.41

Physical State: Solid or liquid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point: 151 to 152°C

Density:

Solubility:

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Planavin

PRODUCTION DATA

Annual U.S.
Production: 2.0

Consumption:

Fraction of
Dispersion: Estimated as 1.0

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 2.0

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
2000 mg/kg
2000 mg/kg

Animal
rat
mammal

Route
oral
unreported

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Polyacrylamide

CHEMICAL NAME

CAS Number: 9005-05-8

Chemical Name: 2-Propenamide, homopolymer

Synonyms: Polyacrylamide
Acrylamide, polymers

**Molecular
Formula:** $(C_3H_5NO)_n$

Structure:
$$\begin{array}{c} \text{O} \\ \parallel \\ (\text{CH}_2 = \text{CH} - \text{C} - \text{NH}_2)_n \end{array}$$

Chemical Properties

Molecular Weight: $(71.08)_n$

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point:

Density:

Solubility: Soluble (H_2O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Polyacrylamide

PRODUCTION DATA

Annual U.S. Production:	12.8 x 10 ⁶ lbs.	Consumption:	12.8 x 10 ⁶ lbs.
Fraction of Dispersion:	1.0	Fraction of Pro- duction Lost:	0.03
Release Rate (million lbs/yr): 13.2			

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
----------------	--------	--------	-------

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Polybutenes

CHEMICAL NAME

CAS Number: 9003-29-6

Chemical Name: Butene, homopolymers

Synonyms: Polybutenes
Butene polymers

**Molecular
Formula:** $(C_4H_8)_n$

Structure: Any of several thermoplastic isotactic polymers of isobutane of varying molecular weight; also polymers of butene-1 and butene-2.

Chemical Properties

Molecular Weight: <3000

Physical State: Liquid

Vapor Pressure: Negligible at 25°C

Vapor Density:

Boiling Point:

Melting Point: -50 to -38°C

Density: 0.83 to 0.89

Solubility: Insoluble (H₂O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Polybutenes

PRODUCTION DATA

Annual U.S. Production:	335.0 x 10 ⁶ lbs. (M.W. <3000)	Consumption:	335.0 x 10 ⁶ lbs.
Fraction of Dispersion:	0.98	Fraction of Production Lost:	0.015
Release Rate (million lbs/yr): 333.3			

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
----------------	--------	--------	-------

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Polychlorinated biphenyl

CHEMICAL NAME

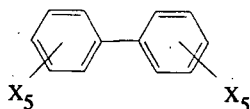
CAS Number: (a) 11097-69-1 (b) 11096-82-5

Chemical Name: (a) Aroclor 1254 (b) Aroclor 1260

Synonyms: (a) PCB 1254 (b) PCB 1260
Chlorinated biphenyls Kanechlor
Polychlorinated biphenyls

Molecular Formula: (exact composition unknown or undetermined)

Structure:



X = Cl or H

Chemical Properties (Aroclor 1254)

Molecular Weight:

Physical State: Liquid-solid

Vapor Pressure: <1 mm at 25°C

Vapor Density:

Boiling Point: 365 to 390°C

Melting Point:

Density: 1.495 to 1.505 at 65°C/15.5°C

Solubility: Slight (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Activity towards OH: $t_{1/2}$ = 26 days

Safety Hazard:

Disaster hazard—dangerous—toxic fumes

Polychlorinated biphenyl

PRODUCTION DATA

Annual U.S. Production:	5.495 x 10 ⁶ lbs.	Consumption:	
Fraction of Dispersion:	1.0	Fraction of Pro- duction Lost:	0.01
Release Rate (million lbs/yr):	30.3		

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
----------------	--------	--------	-------

Non-lethal Acute Effects:
Liver damage

Chronic Toxicity

U.S. Occupational Standard: Aroclor 1254 - 0.5 mg/m³
Aroclor 1242 - 1.0 mg/m³

Carcinogenicity:

Kanechlor 500			
Neoplasm			
TD _{Lo}	17 gm/kg (49 weeks)	rat	oral
Carcinogenicity	23 gm/kg (32 weeks)	mouse	oral
Kanechlor 400			
Neoplasm	7500 mg/kg (1.5 years)	rat	oral
Skin effects			
TD _{Lo}	28 mg/kg	human	oral
Kanechlor 300			
Neoplasm			
TD _{Lo}	18 gm/kg (52 weeks)	rat	oral

Mutagenicity:

Teratogenicity:

Other Chronic Effects:

Polyethylene and co-polymers

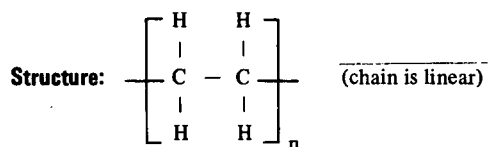
CHEMICAL NAME

CAS Number: 9002-88-4

Chemical Name: Ethylene, polymers

Synonyms: Polyethylene

**Molecular
Formula:** $(C_2H_4)_n$



Chemical Properties

Molecular Weight: $(28.05)_n$

Physical State: Solid

Vapor Pressure: Negligible mm at 25°C

Vapor Density:

Boiling Point: 85 to 110°C

Melting Point: 85 to 110°C

Density: 0.92 average

Solubility: Insoluble (H₂O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Polyethylene and co-polymers

PRODUCTION DATA

Annual U.S.
Production: 2295.9×10^6 lbs.

Consumption: 2010.8×10^6 lbs.

Fraction of
Dispersion: 1.0

1975: High density polymers— $2,289 \times 10^6$ lbs.
Low density polymers— $4,725 \times 10^6$ lbs.

Release Rate (million lbs/yr): 2079.7

Fraction of Pro-
duction Lost: 0.03

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Neoplasm

TD_{Lo}

2120 mg/kg

330 mg/kg

rat

mouse

implant

implant

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Polyethylene glycol

CHEMICAL NAME

CAS Number: 25322-68-3

Chemical Name: Polyethylene glycols

Synonyms: Polyoxyethylene Polyglycol ether
Polyglycol
Ethylene oxide polymer

Molecular Formula: $(C_2H_4O)_nH_2O$

Structure: $H(OCH_2CH_2)_nOH$

Chemical Properties

Molecular Weight: 200 to 6000

Physical State: Liquid

Vapor Pressure: Negligible to 25°C

Vapor Density:

Boiling Point:

Melting Point: 4 to 10°C

Density: 1.110 to 1.140 at 20°C

Solubility: Infinite (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD: 5% of theoretical after 10 days at 20°C with acclimated culture
Total theoretical oxygen demand = 1.7 (gm/gm)

Atmospheric Reactivity:

Safety Hazard:

Fire—moderate

Polyethylene glycol

PRODUCTION DATA

Annual U.S. Production:	52.4 x 10 ⁶ lbs.	Consumption:	44.4 x 10 ⁶ lbs.
Fraction of Dispersion:	0.70	Fraction of Pro- duction Lost:	0.015
Release Rate (million lbs/yr): 31.8			

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
----------------	--------	--------	-------

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity: TD _{Lo}	420 mg/kg (1 year)	mouse	intravaginal
--------------------------------------	--------------------	-------	--------------

Mutagenicity:

Teratogenicity: TLV:

Other Chronic Effects:

Polyethylene glycol chloride

CHEMICAL NAME

CAS Number: (Not listed in 9th Chemical Index)

Chemical Name:

Synonyms: Poly(ethylene glycol) chloride

**Molecular
Formula:** $(C_2H_4O)_nHCl$

Structure: $Cl(CH_2 - CH_2 - O)_nH$

Chemical Properties

Molecular Weight: 100 to 600

Physical State: Liquid

Vapor Pressure: (low)

Vapor Density: 4.31

Boiling Point:

Melting Point: $-90^{\circ}C$ to $20^{\circ}C$ (sets)

Density: 1.18 to 1.14 at $20^{\circ}C/20^{\circ}C$

Solubility: Miscible (H_2O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard: Disaster hazard—dangerous—toxic fumes—chlorides

Polyethylene glycol chloride

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
1070 mg/kg

Animal
rat

Route
oral

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Polyethylene terephthalate

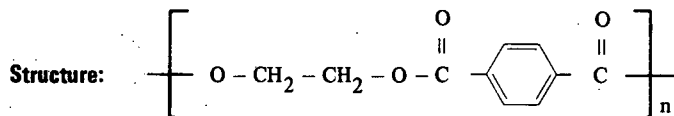
CHEMICAL NAME

CAS Number: 25038-59-9

Chemical Name: Poly(oxy-1,2-ethanedioxy carbonyl-1,4-phenylenecarbonyl)

Synonyms: Polyethylene terephthalate
Polyester resin
Poly(oxyethyleneoxy terephthaloyl)

Molecular Formula: $(C_{10}H_8O_4)_n$



Chemical Properties

Molecular Weight: $(192.17)_n$

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: Decomposes

Melting Point: 265°C

Density:

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Polyethylene terephthalate

PRODUCTION DATA

Annual U.S. Production:	2500 x 10 ⁶ lbs.	Consumption:	2450 x 10 ⁶ lbs.
Fraction of Dispersion:	1.0	Fraction of Pro- duction Lost:	0.015
Release Rate (million lbs/yr):	2487.5		

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
----------------	--------	--------	-------

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Neoplasm

TDLo

50 mg/kg

rat

implant

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Polypropylene

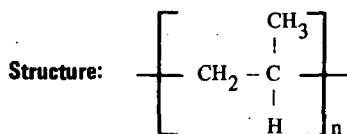
CHEMICAL NAME

CAS Number: 9003-07-0

Chemical Name: 1-Propene, homopolymer

Synonyms: Polypropylene
Propene, polymers

Molecular Formula: $(C_3H_6)_n$



Chemical Properties

Molecular Weight: $>40,000 (42.09)_n$

Physical State: Solid

Vapor Pressure: Negligible at 25°C

Vapor Density:

Boiling Point:

Melting Point: 167°C (isotactic)

Density: 0.90

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Polypropylene

PRODUCTION DATA

Annual U.S.

Production: $2,162 \times 10^6$ lbs. (1973)

Consumption: $1,924 \times 10^6$ lbs. (1973)

Fraction of

Dispersion: 1.0

Fraction of Pro-

duction Lost: 0.03

Release Rate (million lbs/yr): 1563.2

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Polypropylene glycol

CHEMICAL NAME

CAS Number: 25322-69-4

Chemical Name: α -Hydro-O-hydroxypoly [oxy (methyl-1,2-ethanediyl)]

Synonyms: Polypropylene glycols
Poly (propylene oxide)
Polyglycol

Molecular Formula: $(C_3H_6O)_nH_2O$

Structure: $HO(C_3H_6O)_nH$

Chemical Properties

Molecular Weight: (76.11-monomer) 400 to 2000 **Physical State:** Liquid

Vapor Pressure: **Vapor Density:**

Boiling Point: 189°C (monomer) **Melting Point:** Does not crystalize

Density: 1.002 to 1.007 **Solubility:** Infinite (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard: Fire-slight

Polypropylene glycol

PRODUCTION DATA

Annual U.S.

Production: 359.2×10^6 lbs.

Consumption: 302.2×10^6 lbs.

Fraction of

Dispersion: 0.07

Fraction of Pro-

duction Lost: 0.015

Release Rate (million lbs/yr): 26.6

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
419 mg/kg

Animal
rat

Route
oral

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Polystyrene

CHEMICAL NAME

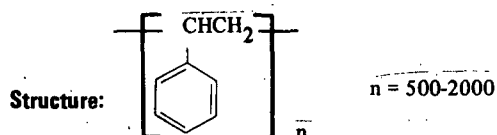
CAS Number: 9003-53-6

Chemical Name: Ethynlbenzene, homopolymer

Synonyms: Styrene, polymers
Polystyrene, straight (thermoplastic resins)
Phenylethylene

Vinylbenzene

Molecular Formula: $(C_8H_8)_n$



Chemical Properties (monomer)

Molecular Weight: 104.16

Physical State: Solid

Vapor Pressure: Negligible

Vapor Density:

Boiling Point: 145.2°C at 760 mm

Melting Point: -30.63

Density: 0.9060 at 20°C/4°C

Solubility: Insoluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Polystyrene

PRODUCTION DATA

Annual U.S.**Production:** $3,322 \times 10^6$ lbs. (1973)**Consumption:** $3,005 \times 10^6$ lbs. (1973) $(2,641 \times 10^6$ lbs., 1975)**Fraction of****Dispersion:** 1.0**Fraction of Pro-****duction Lost:** 0.03**Release Rate (million lbs/yr):** 1471

TOXICITY DATA

Acute Toxicity**Dosage****Animal****Route****Chronic Toxicity****U.S. Occupational Standard:****Carcinogenicity:**

Neoplasm

TD_{Lo}

19 mg/kg

rat

implant

Mutagenicity:**Teratogenicity:****TLV:****Other Chronic Effects:**

Polystyrene, thermoplastic resins

CHEMICAL NAME

CAS Number: (Chemical mixture)

Chemical Name:

Synonyms: Polystyrene, rubber modified (thermoplastic resins)
Styrene, polymers

**Molecular
Formula:** $(C_8H_8)_n$

Structure: Mixture of polystyrene and polybutadiene

Chemical Properties

Molecular Weight:

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point:

Density: 1.01 to 1.07

Solubility: Insoluble (H_2O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Polystyrene, thermoplastic resins

PRODUCTION DATA

Annual U.S. Production:	1647 x 10 ⁶ lbs.	Consumption:	1678 x 10 ⁶ lbs.
Fraction of Dispersion:	1.0	Fraction of Production Lost:	0.03
Release Rate (million lbs/yr):	1,727.4		

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
----------------	--------	--------	-------

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity: Reports of leukemia at rubber plants

Mutagenicity:

Teratogenicity: TLV:

Other Chronic Effects:

Polytetrafluoroethylene

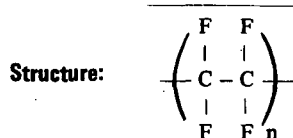
CHEMICAL NAME

CAS Number: 116-14-3

Chemical Name: Tetrafluoroethene

Synonyms: Teflon
TFE
Perfluoroethylene

**Molecular
Formula:** C_2F_4



Chemical Properties (Monomer)

Molecular Weight: 100.02

Physical State: Gas

Vapor Pressure:

Vapor Density:

Boiling Point: -76.3°C at 760 mm

Melting Point: -142.5°C

Density: 1.519 at 76.3°C

Solubility: Insoluble (H_2O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity: Resistant to oxidation, moisture, ozone and U.V. radiation

Safety Hazard:

Disaster hazard—dangerous—toxic fumes—fluorides

Polytetrafluoroethylene

PRODUCTION DATA

Annual U.S.
Production: 13.2×10^6 lbs.

Consumption: 14.6×10^6 lbs.

Fraction of
Dispersion: 1.0

Fraction of Pro-
duction Lost: 0.03

Release Rate (million lbs/yr): 15.0

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Non-lethal Acute Effects:

Dust can cause "polymer fume fever"

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Neoplasm

TD_{Lo}

80 mg/kg

rat

implant

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Polyvinyl alcohol

CHEMICAL NAME

CAS Number: 9002-89-5

Chemical Name: Ethanol, homopolymer

Synonyms: Polyvinyl alcohol
PVA
Vinyl alcohol, polymers

Molecular Formula: $(C_2H_4O)_n$

Structure: $\left(CH_2CH(OH) \right)_n$

Chemical Properties

Molecular Weight: 25,000 to 300,000

Vapor Pressure:

Boiling Point: $>200^{\circ}C$ (decomposes)

Density: 1.329

Octanol/Water Partition Coefficient:

Physical State: Solid

Vapor Density:

Melting Point:

Solubility: Solubility in H_2O increases with increasing molecular weight.

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Fire—slight

Explosion—slight

Polyvinyl alcohol

PRODUCTION DATA

Annual U.S.**Production:** 100 to 141 x 10⁶ lbs. (1974)**Consumption:** 141.1 x 10⁶ lbs. (1975)**Fraction of****Dispersion:** 1.0**Fraction of Pro-****duction Lost:** 0.03**Release Rate (million lbs/yr):** 104.0

TOXICITY DATA

Acute Toxicity**Dosage****Animal****Route****Chronic Toxicity****U.S. Occupational Standard:****Carcinogenicity:**TD_{Lo}

2500 mg/kg

rat

subcutaneous

Mutagenicity:**Teratogenicity:****TLV:****Other Chronic Effects:**

Polyvinyl chloride

CHEMICAL NAME

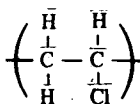
CAS Number: 9002-86-2

Chemical Name: Chloroethylene, polymers

Synonyms: Polyvinyl chloride
PVC

**Molecular
Formula:** $(C_2H_3Cl)_n$

Structure:



Chemical Properties

Molecular Weight: 60,000

Physical State: Solid

Vapor Pressure: Negligible at 25°C

Vapor Density:

Boiling Point: Decomposes

Melting Point:

Density: 1.406

Solubility: Insoluble (H₂O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Photochemical degradation: Biodegradable, photodegradable

Unreactive to RO₂, O₃

Hydrolysis is slow (rates unknown)

Safety Hazard:

Disaster hazard—dangerous—toxic fumes

Polyvinyl chloride

PRODUCTION DATA

Annual U.S. Production:	4,562 x 10 ⁶ lbs. (1973)	Consumption:	4,586 x 10 ⁶ lbs. (1973)
			(3,615 x 10 ⁶ lbs. in 1975)
Fraction of Dispersion:	1.0	Fraction of Production Lost:	0.03
Release Rate (million lbs/yr): 4385.7			

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
----------------	--------	--------	-------

Non-lethal Acute Effects:
Dermatitis

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity: Carcinogen (sarcomas, granulomas)

Neoplasm:

TD_{Lo}

100 mg/kg

rat

implant

Mutagenicity:

Teratogenicity:

Positive

rat

intraperitoneal

TLV:

Other Chronic Effects:

Princep

CHEMICAL NAME

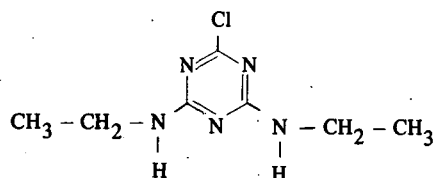
CAS Number: 122-34-9

Chemical Name: 2-Chloro-4,6-bis(ethylamino)-s-triazine

Synonyms: 2-Chloro-4,6-bis(dimethylamino)-s-triazine

Molecular Formula: $C_7H_{12}ClN_5$

Structure:



Chemical Properties

Molecular Weight: 221.75

Physical State: Liquid

Vapor Pressure: 6.1×10^{-9} mm at $20^\circ C$

Vapor Density:

Boiling Point:

Melting Point: 225 to $227^\circ C$

Density: 1.0956

Solubility: 5 ppm H_2O at $20^\circ C$

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Decomposed by ultraviolet irradiation

Safety Hazard:

Disaster hazard—dangerous—chlorides

PRODUCTION DATA**Annual U.S.****Production:** 5×10^6 lbs.**Consumption:****Fraction of****Dispersion:** Estimated as 1.0**Fraction of Pro-****duction Lost:** 0.015**Release Rate (million lbs/yr):** 5.0**TOXICITY DATA****Acute Toxicity**LD₅₀

No toxicity in man reported

Dosage

5000 mg/kg

Animal

rat

Route

oral

Chronic Toxicity**U.S. Occupational Standard:****Carcinogenicity:****Mutagenicity:****Teratogenicity:****TLV:****Other Chronic Effects:**

Propachlor

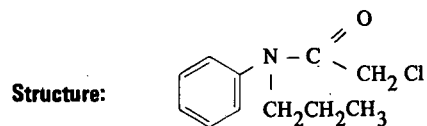
CHEMICAL NAME

CAS Number: 1918-16-7

Chemical Name: 2-Chloro-N-(1-methylethyl)-N-phenylacetamide

Synonyms: Ramrod
2-Chloro-N-isopropylacetanilide
N-Isopropyl-2-chloroacetanilide

Molecular Formula: $C_{11}H_{14}ClNO$



Chemical Properties

Molecular Weight: 211.5

Physical State: Solid

Vapor Pressure: 2.3×10^{-4} mm at 25°C

Vapor Density:

Boiling Point: 110°C at 0.03 mm

Melting Point: 67 to 76°C

Density:

Solubility: 700 ppm (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—dangerous—toxic fumes—chlorides

Propachlor

PRODUCTION DATA

Annual U.S. Production:	23 x 10 ⁶ lbs.	Consumption:	23 x 10 ⁶ lbs.
Fraction of Dispersion:	Estimated as 1.0	Fraction of Production Lost:	0.01
Release Rate (million lbs/yr):	23.2		

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	1200 mg/kg	rat	oral
	380 mg/kg	rabbit	skin
	800 mg/kg	mammal	unreported

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Skin and eye irritant

Propane

CHEMICAL NAME

CAS Number: 74-986

Chemical Name: Propane

Synonyms: Dimethyl methane

Molecular

Formula: C_3H_8

Structure: $CH_3 - CH_2 - CH_3$

Chemical Properties

Molecular Weight: 44.09

Physical State: Gas

Vapor Pressure: 7095 mm at 25°C

Vapor Density: 1.56

Boiling Point: -42.07°C at 760 mm

Melting Point: -189.9°C

Density: 0.5852 at -44.5°C/4°C

Solubility: 119 gm/l (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts vigorously with oxidizing materials

Safety Hazard:

Fire—highly dangerous

Explosion—severe

Propane

PRODUCTION DATA

**Annual U.S.
Production:** 9608.3×10^6 lbs.

Consumption: 9608.3×10^6 lbs.

**Fraction of
Dispersion:** 0

**Fraction of Pro-
duction Lost:** 0.01

Release Rate (million lbs/yr): 96.1

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
----------------	--------	--------	-------

Non-lethal Acute Effects:

Paralysis by inhalation of concentrated gas

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 1000 ppm

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 1000 ppm

Other Chronic Effects:

Propanil

CHEMICAL NAME

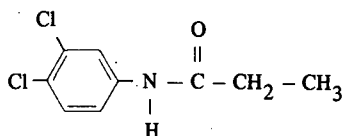
CAS Number: 709-98-8

Chemical Name: N-(3,4-Dichlorophenyl)propanamide

Synonyms: Propanil
3,4-Dichloropropionanilide

Molecular Formula: C₉H₇Cl₂NO

Structure:



Chemical Properties

Molecular Weight: 218.09

Physical State: Solid (pure compound)
Liquid (technical compound)

Vapor Pressure:

Vapor Density:

Boiling Point: 91 to 95°C (technical)

Melting Point: 85 to 89°C (pure)

Density: 1.25 at 25°C

Solubility: 0.05% in H₂O

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—dangerous—chlorides

Propanil

PRODUCTION DATA

**Annual U.S.
Production:** 6.0 x 10⁶ lbs.

Consumption:

**Fraction of
Dispersion:** Estimated as 1.0

**Fraction of Pro-
duction Lost:** 0.015

Release Rate (million lbs/yr): 6.0

TOXICITY DATA

Acute Toxicity LD ₅₀	Dosage	Animal	Route
	1500 mg/kg	rat	oral
	560 mg/kg	rat	oral
	1300 mg/kg	rat	oral
	1217 mg/kg	dog	oral
	500 mg/kg	rabbit	unreported

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Propargyl alcohol

CHEMICAL NAME

CAS Number: 107-19-7

Chemical Name: 2 Propyn-1-ol

Synonyms: Propiolic alcohol

Molecular

Formula: C_3H_4O

Structure: $HC \equiv C - CH_2OH$

Chemical Properties

Molecular Weight: 56.07

Physical State: Volatile liquid

Vapor Pressure:

Vapor Density:

Boiling Point: 113.6°C at 760 mm

Melting Point: -48°C

Density: 0.9715 at 20°C/4°C

Solubility: Soluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Propargyl alcohol

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

LD₅₀

LC_{Lo}

Dosage

0.07 mg/kg

2000 mg/kg

Animal

rat

mouse

Route

oral

inhalation

Non-lethal Acute Effects:

CNS depressant

Irritant to skin and mucous membranes

Chronic Toxicity

U.S. Occupational Standard: (air) 1 ppm (skin)

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Propazine

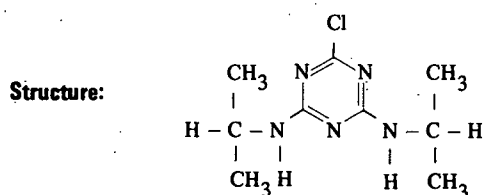
CHEMICAL NAME

CAS Number: 139-40-2

Chemical Name: 2-Chloro-4,6-bis(isopropylamino)-s-triazine

Synonyms: Propazine

**Molecular
Formula:** $C_9H_{16}ClN_5$



Chemical Properties

Molecular Weight: 229.74

Physical State: Solid

Vapor Pressure: 2.9×10^{-8} mm at 20°C

Vapor Density:

Boiling Point:

Melting Point: 212 to 214°C

Density:

Solubility: Slightly soluble
(8.6 ppm H₂O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Propazine

PRODUCTION DATA

Annual U.S.
Production: 4.0×10^6 lbs.

Consumption:

Fraction of
Dispersion: Estimated as 1.0

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 4.0

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
485 mg/kg

Animal
rat

Route
oral

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:
Neoplasm

TD_{Lo}

22 gm/kg (82 weeks)
750 mg/kg (15 weeks)

rat
rat

oral
subcutaneous

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Propiolactone

CHEMICAL NAME

CAS Number: 57-57-8

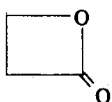
Chemical Name: 2-Oxetanone

Synonyms: β -Propiolactone
Hydraacrylic acid β lactone
Propanolide

3-Hydroxypropionic acid, lactone

**Molecular
Formula:** $C_3H_4O_2$

Structure:



Chemical Properties

Molecular Weight: 72.06

Physical State: Liquid

Vapor Pressure:

Vapor Density:

Boiling Point: 162°C (decomposes)

Melting Point: -33.4°C

Density: 1.1460 at 20°C/5°C

Solubility: Decomposes (H_2O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—moderate

Propiolactone

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
345 mg/kg

Animal
mouse

Route
intravenous

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Carcinogen
TD_{Lo}

12,865 mg/kg (62 weeks) hamster
56,400 mg/kg (141 weeks) guinea pigs
3500 mg/kg (70 weeks) rat
20 mg/kg (34 weeks) rat
180 mg/kg (30 weeks) rat
8100 mg/kg (27 weeks) mouse
69 mg/kg (43 weeks) mouse

skin
skin
oral
subcutaneous
intratracheal
skin
subcutaneous

Neoplastic effects:
TD_{Lo}

40 mg/kg

mouse

intravenous

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Propionaldehyde

CHEMICAL NAME

CAS Number: 123-38-6

Chemical Name: Propionaldehyde

Synonyms: Propyl aldehyde
Propylic aldehyde

Propanal
Propionic aldehyde

**Molecular
Formula:** C₃H₆O

Structure:
$$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3 - \text{CH}_2 - \text{C} - \text{H} \end{array}$$

Chemical Properties

Molecular Weight: 58.08

Physical State: Liquid

Vapor Pressure: 10 mm at 25°C

Vapor Density: 2.0

Boiling Point: 48.8°C

Melting Point: -81°C

Density: 0.8058 at 20°C/4°C

Solubility: Soluble (H₂O)

**Octanol/Water Partition
Coefficient:** 0.38

Environmental Persistence

BOD: 95% of theoretical

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:
Fire—dangerous

Propionaldehyde

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	820 mg/kg	rat	subcutaneous
	680 mg/kg	mouse	subcutaneous
LD _{Lo}	800 mg/kg	rat	oral
	800 mg/kg	mouse	oral
	3400 mg/kg	rabbit	skin
TC _{Lo}	8000 ppm (4 hours)	rat	inhalation

Non-lethal Acute Effects:

Local irritant to respiratory tract

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Propionic acid

CHEMICAL NAME

CAS Number: 79-09-4

Chemical Name: Propionic acid

Synonyms: Methylacetic acid
Propanoic acid

Molecular
Formula: $C_3H_6O_2$

Structure:
$$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3 - \text{CH}_2 - \text{C} - \text{OH} \end{array}$$

Chemical Properties

Molecular Weight: 74.09

Physical State: Liquid

Vapor Pressure: 4.49 at 25°C

Vapor Density: 2.56

Boiling Point: 141°C at 760 mm

Melting Point: -20.8°C

Density: 0.992

Solubility: Infinite (H_2O)

Octanol/Water Parti-
tion Coefficient: 0.52

Environmental Persistence

BOD: 56% of theoretical

Atmospheric Reactivity:

Safety Hazard: Fire —moderate

Propionic acid

PRODUCTION DATA

Annual U.S. Production: 60.4×10^6 lbs. (1973)

Consumption: 60.4×10^6 lbs. (1973)
(65×10^6 lbs., 1975)

Fraction of Dispersion:

Fraction of Production Lost: 0.015

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity LD ₅₀	Dosage	Animal	Route
	1510 mg/kg	rat	oral
	1370 mg/kg	mouse	oral
	625 mg/kg	mouse	intravenous
	1900 mg/kg	rabbit	oral
	500 mg/kg	rabbit	skin

Non-lethal Acute Effects:
Local irritant to eyes, skin, and mucous membranes

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Propyl acetate

CHEMICAL NAME

CAS Number: 109-60-4

Chemical Name: Acetic acid, propyl ester

Synonyms: n-Propyl acetate
Propyl ester of acetic acid

**Molecular
Formula:** C₅H₁₀O₂

Structure:
$$\begin{array}{c} \text{O} \\ || \\ \text{CH}_3 - \text{C} - \text{O} - \text{CH}_2 - \text{CH}_2 - \text{CH}_3 \end{array}$$

Chemical Properties

Molecular Weight: 102.13

Physical State: Liquid

Vapor Pressure: 40 mm at 28.8°C

Vapor Density: 3.52

Boiling Point: 101.6°C at 760 mm

Melting Point: -95°C

Density: 0.8898 at 20°C/4°C

Solubility: Slightly (H₂O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD: 72% of theoretical after 20 days at 20°C
Total theoretical oxygen demand = 2.04 gm/gm

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—dangerous
Explosion—moderate

Propyl acetate

PRODUCTION DATA

Annual U.S. Production:	32.4 x 10 ⁶ lbs.	Consumption:	32.4 x 10 ⁶ lbs.
Fraction of Dispersion:	0.75	Fraction of Pro- duction Lost:	0.015
Release Rate (million lbs/yr): 24.8			

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	6630 mg/kg	rabbit	oral
LC _{Lo}	8000 ppm (4 hours)	rat	inhalation

Non-lethal Acute Effects:
Conjunctivitis
Irritation of skin

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 200 ppm

Carcinogenicity:

Mutagenicity:

Teratogenicity: TLV: 200 ppm

Other Chronic Effects:

Propyl alcohol

CHEMICAL NAME

CAS Number: 71-23-8

Chemical Name: Propyl alcohol

Synonyms: Ethyl carbinol
Propan-1-ol
1-Propanol

**Molecular
Formula:** C₃H₈O

Structure: $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{OH}$

Chemical Properties

Molecular Weight: 60.11

Physical State: Liquid

Vapor Pressure: 19.8 mm at 25°C

Vapor Density: 2.07

Boiling Point: 97°C at 760 mm

Melting Point: -126.5°C

Density: 0.8035 at 20°C/4°C

Solubility: Infinite (H₂O)

**Octanol/Water Parti-
tion Coefficient:** 0.74

Environmental Persistence

BOD: 85% of theoretical after 20 days at 20°C
Total theoretical oxygen demand = 2.40 gm/gm
Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—dangerous
Explosion—moderate

Propyl alcohol

PRODUCTION DATA

Annual U.S.
Production: 83.1 x 10⁶ lbs. Consumption: 83.1 x 10⁶ lbs.

Fraction of
Dispersion: 0.75 Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 63.6

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	1.9 g/kg	rats	oral
	1870 mg/kg	rats	oral
	3230 mg/kg	mouse	subcutaneous
LD _{Lo}	5700 mg/kg	woman	oral
	140 mg/kg	mouse	oral
	3500 mg/kg	rabbit	oral
	5 mg/kg	mammal	subcutaneous
LC _{Lo}	4000 ppm (4 hours)	rat	inhalation

Non-lethal Acute Effects:

Conjunctivitis
Vomiting
Anemia

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 200 ppm

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 200 ppm

Other Chronic Effects:

Propylamine

CHEMICAL NAME

CAS Number: 107-10-8

Chemical Name: Propylamine

Synonyms: 1-Aminopropane

**Molecular
Formula:** C₃H₉N

Structure: $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{NH}_2$

Chemical Properties

Molecular Weight: 59.11

Physical State: Liquid

Vapor Pressure: 248 mm at 20°C

Vapor Density:

Boiling Point: 47.8°C at 760 mm

Melting Point: -83.0°C

Density: 0.7173 at 20°C/4°C

Solubility: Soluble (H₂O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:
Fire—dangerous

Propylamine

PRODUCTION DATA

Annual U.S.**Production:** 0.2×10^6 lbs. (1969)**Consumption:****Fraction of
Dispersion:****Fraction of Pro-
duction Lost:** 0.015**Release Rate (million lbs/yr):**

TOXICITY DATA

Acute ToxicityLD₅₀LD_{Lo}LC₅₀**Dosage**

560 mg/kg

570 mg/kg

2310 ppm (4 hours)

Animal

rabbit

rat

rat

Route

skin

oral

inhalation

Non-lethal Acute Effects:

Irritant

Skin sensitizer

Chronic Toxicity**U.S. Occupational Standard:****Carcinogenicity:****Mutagenicity:****Teratogenicity:****TLV:****Other Chronic Effects:**

Propyl chloride

CHEMICAL NAME

CAS Number: 540-54-5

Chemical Name: 1-Chloropropane

Synonyms: n-Propylchloride

Molecular

Formula: C_3H_7Cl

Structure: $CH_3 - CH_2 - CH_2 - Cl$

Chemical Properties

Molecular Weight: 78.54

Physical State: Liquid

Vapor Pressure: 348.8 mm at 25°C

Vapor Density: 2.71

Boiling Point: 46.6°C at 760 mm

Melting Point: -122.8°C

Density: 0.8909 at 20°C/4°C

Solubility: Slightly (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—dangerous

Explosion—moderate

Propyl chloride

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Non-lethal Acute Effects:

Irritant to mucous membranes

Narcotic at high concentrations

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Propylene

CHEMICAL NAME

CAS Number: 115-07-1

Chemical Name: Propene

Synonyms: Propylene
Methylethylene

**Molecular
Formula:** C₃H₆

Structure: $\text{CH}_3 - \text{CH} = \text{CH}_2$

Chemical Properties

Molecular Weight: 42.09

Physical State: Gas

Vapor Pressure: 8582 mm at 25°C

Vapor Density: 1.46

Boiling Point: -47.4°C at 760 mm

Melting Point: -185.2°C

Density: 0.5139 at 20°C/4°C

Solubility: Slightly (0.78 gm/1 H₂O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—dangerous

Explosion—moderate

Propylene

PRODUCTION DATA

Annual U.S. Production:	22 to 24 x 10 ⁹ lbs. (1974)	Consumption:	22 to 24 x 10 ⁹ lbs. (1974)
Fraction of Dispersion:	0	Fraction of Production Lost:	0.015
Release Rate (million lbs/yr):	127.1		

TOXICITY DATA

Acute Toxicity (Mild)	Dosage	Animal	Route
--------------------------	--------	--------	-------

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Propylene chlorohydrin

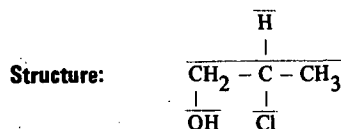
CHEMICAL NAME

CAS Number: 78-89-7

Chemical Name: 2-Chloro-1-propanol

Synonyms: Propylene chlorohydrin
2-Chloropropyl alcohol

**Molecular
Formula:** C₃H₇ClO



Chemical Properties

Molecular Weight: 94.54

Physical State: Liquid

Vapor Pressure: 4.9 mm at 20°C

Vapor Density: 3.26

Boiling Point: 133 to 134°C

Melting Point:

Density: 1.1128 at 20°C/20°C

Solubility: Soluble (H₂O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—moderate

Disaster hazard—dangerous—toxic fumes—chlorides

Propylene chlorohydrin

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

LD₅₀

Dosage

220 mg/kg

480 mg/kg

720 mg/kg

500 mg/kg

Animal

rat

rabbit

guinea pig

rat

Route

oral

skin

oral

inhalation

LC_{Lo}

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Propylene glycol

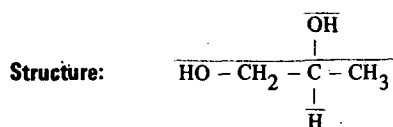
CHEMICAL NAME

CAS Number: 57-55-6

Chemical Name: 1,2-Propanediol

Synonyms: Propyleneglycol
1,2-Dihydroxy propane

**Molecular
Formula:** $C_3H_8O_2$



Chemical Properties

Molecular Weight: 76.11

Physical State: Liquid

Vapor Pressure: 1 mm at 45.5°C

Vapor Density: 2.62

Boiling Point: 187.3°C

Melting Point:

Density: 1.0361 at 20°C/4°C

Solubility: Infinite (H₂O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD: 79% of theoretical after 20 days at 20°C

Total theoretical oxygen demand = 1.68 gm/gm

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—moderate

Propylene glycol

PRODUCTION DATA

Annual U.S.
Production: 562.6 x 10⁶ lbs. Consumption: 454.8 x 10⁶ lbs.

Fraction of
Dispersion: 0.32 Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 154.0

TOXICITY DATA

Acute Toxicity LD ₅₀	Dosage	Animal	Route
	945 mg/kg	rat	oral
	283 mg/kg	rat	intraperitoneal
	195 mg/kg	rat	intravenous
	890 mg/kg	mouse	oral
	471 mg/kg	mouse	intraperitoneal
	285 mg/kg	mouse	subcutaneous
	322 mg/kg	mouse	intravenous
	220 mg/kg	rabbit	intravenous
	821 mg/kg	hamster	oral
	322 mg/kg	hamster	intraperitoneal

Non-lethal Acute Effects:
Local irritant
Allergen

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Propyleneimine

CHEMICAL NAME

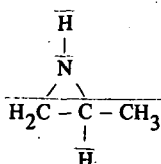
CAS Number: 75-55-8

Chemical Name: 2-Methylaziridine

Synonyms: Propyleneimine
1,2-Propyleneimine

**Molecular
Formula:** C₃H₇N

Structure:



Chemical Properties

Molecular Weight: 58.10

Physical State: Liquid

Vapor Pressure:

Vapor Density: 2.0

Boiling Point: 66 to 67°C

Melting Point:

Density: 0.81 at 25°C/25°C

Solubility: Soluble (H₂O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—moderate

Disaster hazard—dangerous—toxic fumes—NO_x

Propyleneimine

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	19 mg/kg	rat	oral
	43 mg/kg	guinea pig	skin
LC _{Lo}	500 ppm (4 hours)	rat	inhalation
	500 ppm (1 hour)	guinea pig	inhalation

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 2 ppm (skin)

Carcinogenicity: Carcinogen

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Propylene oxide

CHEMICAL NAME

CAS Number: 75-56-9

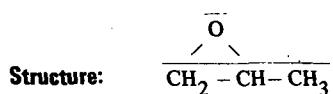
Chemical Name: Propene oxide

Synonyms: Propylene oxide
Methyl oxirane

1,2-Epoxy propane

Molecular

Formula: C_3H_6O



Chemical Properties

Molecular Weight: 58.08

Physical State: Liquid

Vapor Pressure: 596 mm at 25°C

Vapor Density: 2.0

Boiling Point: 33.9°C at 760 mm

Melting Point: -104.4°C

Density: 0.8394 at 20°C/4°C

Solubility: Soluble (650 gm/1 H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD: 12% of theoretical after 10 days at 20°C

Total theoretical oxygen demand = 2.2 gm/gm

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—highly dangerous

Explosion—highly dangerous

Propylene oxide

PRODUCTION DATA

Annual U.S.
Production: 1640 x 10⁶ lbs. Consumption: 1620 x 10⁶ lbs.

Fraction of
Dispersion: 0.01 Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 40.8

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	930 mg/kg	rat	oral
	1500 mg/kg	rabbit	skin
	690 mg/kg	guinea pig	oral
LC ₅₀	1740 ppm (4 hours)	mouse	inhalation
LC _{Lo}	4000 ppm (4 hours)	rat	inhalation
	2005 ppm (4 hours)	dog	inhalation

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 100 ppm

Carcinogenicity: Experimentation carcinogen

Mutagenicity:

Teratogenicity: TLV:

Other Chronic Effects:

Moderately severe effects from inhalation and ingestion

Pyridine

CHEMICAL NAME

CAS Number: 110-86-1

Chemical Name: Pyridine

Synonyms: Azine
Azabenzene

**Molecular
Formula:** C_5H_5N

Structure:



Chemical Properties

Molecular Weight: 79.10

Physical State: Liquid

Vapor Pressure: 20.3 mm at 25°C

Vapor Density: 2.73

Boiling Point: 115.3°C

Melting Point: -42.0°C

Density: 0.982 at 20°C

Solubility: Infinite (H_2O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—dangerous

Explosion—severe

Disaster hazard—dangerous—toxic fumes—cyanides

Pyridine

PRODUCTION DATA

Annual U.S.**Production:** >60 x 10⁶ lbs. (1976 capacity)**Consumption:****Fraction of
Dispersion:****Fraction of Pro-
duction Lost:** 0.015**Release Rate (million lbs/yr):**

TOXICITY DATA

Acute ToxicityLD₅₀**Dosage**

891 mg/kg

1000 mg/kg

1121 mg/kg

LC₅₀

4000 ppm (4 hours)

LD_{Lo}

1200 mg/kg

870 mg/kg

4000 mg/kg

Animal

rat

rat

rabbit

rat

mouse

guinea pig

guinea pig

Route

oral

subcutaneous

skin

inhalation

intraperitoneal

intraperitoneal

oral

Non-lethal Acute Effects:

Local irritant

CNS depressant

Kidney and liver damage

Gastrointestinal upset

Chronic Toxicity**U.S. Occupational Standard:** (air) TWA 5 ppm**Carcinogenicity:****Mutagenicity:****Teratogenicity:****TLV:** 5 ppm**Other Chronic Effects:**

Radox

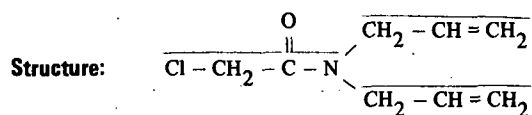
CHEMICAL NAME

CAS Number: 93-71-0

Chemical Name: N,N-Diallyl-2-chloroacetamide

Synonyms: 2-Chloro-N,N-diallyl acetamide

Molecular Formula: $C_8H_{12}ClNO$



Chemical Properties

Molecular Weight: 173.7

Physical State: Liquid

Vapor Pressure: <20 mm at 25°C

Vapor Density:

Boiling Point: 74°C at 0.3 mm

Melting Point:

Density:

Solubility: Slightly (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—dangerous—chloridés

PRODUCTION DATA

Annual U.S. Production:	10 x 10 ⁶ lbs.	Consumption:	
Fraction of Dispersion:	Estimated as 1.0	Fraction of Production Lost:	<u>0.015</u>
Release Rate (million lbs/yr):	10.0		

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	700 mg/kg	rat	oral
	360 mg/kg	rat	skin
	700 mg/kg	mammal	unreported

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity: TLV:

Other Chronic Effects: Irritant to skin and eyes

Resorcinol

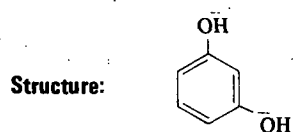
CHEMICAL NAME

CAS Number: 108-46-3

Chemical Name: Resorcinol

Synonyms: 1,3-Benzendiol
Resorcin
Dihydroxybenzene

Molecular Formula: $C_6H_6O_2$



Chemical Properties

Molecular Weight: 110.12

Physical State: Solid

Vapor Pressure: 1 mm at 108.4°C

Vapor Density: 3.79

Boiling Point: 276.5°C at 760 mm

Melting Point: 110.7°C

Density: 1.285 at 15°C

Solubility: Soluble (H_2O)

Octanol/Water Partition Coefficient: 0.80

Environmental Persistence

BOD: 61% of theoretical

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—slight

Resorcinol

PRODUCTION DATA

Annual U.S. Production: 35 x 10⁶ lbs. (1976 capacity)

Consumption:

Fraction of Dispersion:

Fraction of Production Lost: 0.015

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	301 mg/kg	rat	oral
	340 mg/kg	mouse	subcutaneous
LD _{Lo}	270 mg/kg	frog	parenteral

Non-lethal Acute Effects:

Dermatitis
Eye irritant
Methemoglobinemia
Convulsions
Tachycardia
Jaundice

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Ronnel

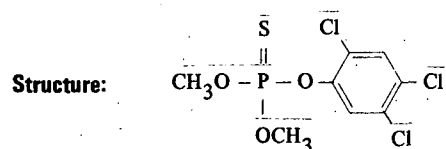
CHEMICAL NAME

CAS Number: 299-84-3

Chemical Name: Phosphorothioic acid, O,O-dimethyl-O-(2,4,5-trichlorophenyl)ester

Synonyms: Ronnel
Fenchlorphos
O,O-Dimethyl-O-(2,4,5-trichlorophenyl) phosphorothioate

Molecular Formula: $C_8H_8Cl_3O_3PS$



Chemical Properties

Molecular Weight: 321.6

Physical State: Solid

Vapor Pressure: 8×10^{-3} mm at 25°C

Vapor Density:

Boiling Point:

Melting Point: 41°C

Density:

Solubility: 800 ppm H_2O

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

PRODUCTION DATA

**Annual U.S.
Production:** 2.0×10^6 lbs.

Consumption:

**Fraction of
Dispersion:** Estimated as 1.0

**Fraction of Pro-
duction Lost:** 0.015

Release Rate (million lbs/yr): 2.0

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
1760 mg/kg
1000 mg/kg
906 mg/kg
2000 mg/kg
2823 mg/kg
118 mg/kg
80 mg/kg
400 mg/kg

Animal
rat
rabbit
rat
rat
rat
mouse
wild bird
mammal

Route
oral
skin
oral
skin
intraperitoneal
intraperitoneal
oral
unreported

Non-lethal Acute Effects:
Edema of lungs
Convulsions
Heart attack
Vomiting

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 10 mg/m^3

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 15 mg/m^3

Other Chronic Effects:

Ruelene

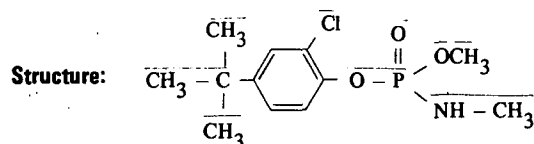
CHEMICAL NAME

CAS Number: 299-86-5

Chemical Name: Methyl phosphoramidic acid, 4-tert-butyl-2-chlorophenyl methyl ester

Synonyms: Ruelene
4-t-Butyl-2-chlorophenyl-O-methyl methyl phosphoroamidate

Molecular Formula: $C_{12}H_{19}ClNO_3P$



Chemical Properties

Molecular Weight: 291.74

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point: 61.8°C

Density: 1.6

Solubility: 0.5 gm/100 ml H₂O at 25°C

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Ruelene

PRODUCTION DATA

Annual U.S.
Production: 2.0×10^6 lbs.

Consumption:

Fraction of
Dispersion: Estimated as 1.0

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 2.0

TOXICITY DATA

Acute Toxicity LD ₅₀	Dosage	Animal	Route
	770 mg/kg	rat	oral
	460 mg/kg	rat	oral
	770 mg/kg	rat	unreported
	400 mg/kg	rabbit	oral
	1000 mg/kg	guinea pig	oral
	218 mg/kg	chicken	oral
	100 mg/kg	wild bird	oral

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 5 mg/m³

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects: Moderate irritant to eyes
Emesis

Salicylic acid

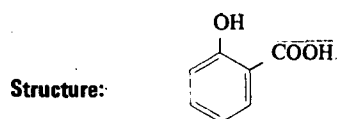
CHEMICAL NAME

CAS Number: 69-72-7

Chemical Name: Salicylic acid

Synonyms: o-Hydroxybenzoic acid

**Molecular
Formula:** $C_7H_6O_3$



Chemical Properties

Molecular Weight: 138.13

Physical State: Solid

Vapor Pressure: 1 mm at 113.7°C

Vapor Density: 4.8

Boiling Point: 211°C at 20 mm (sublimes)

Melting Point: 158 to 161°C

Density: 1.443 at 20°C/4°C

Solubility: Slightly (H_2O)
Very soluble (hot H_2O)

**Octanol/Water Parti-
tion Coefficient:** 2.32

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Fire--slight

Explosion--slight

Salicylic acid

PRODUCTION DATA

Annual U.S. Production:	35.0 x 10 ⁶ lbs. (acetosalicate)	Consumption:	35.2 x 10 ⁶ lbs.
Fraction of Dispersion:	1.0	Fraction of Production Lost:	0.03
Release Rate (million lbs/yr):	35.9		

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	891 mg/kg	rat	oral
LD ₆₀	520 mg/kg	mouse	subcutaneous
LD _{Lo}	700 mg/kg	rat	subcutaneous
	450 mg/kg	dog	oral
	991 mg/kg	dog	intraperitoneal
	300 mg/kg	dog	subcutaneous
	1300 mg/kg	rabbit	oral
	900 mg/kg	guinea pig	intraperitoneal
	850 mg/kg	guinea pig	subcutaneous
	500 mg/kg	frog	subcutaneous

Non-lethal Acute Effects:

- Nausea
- Rapid pulse
- Skin eruptions

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Silvex

CHEMICAL NAME

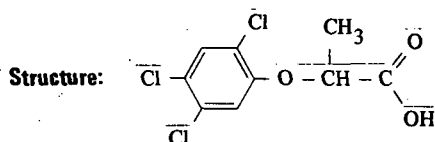
CAS Number: 93-72-1

Chemical Name: 2-(2,4,5-Trichlor-phenoxy)propionic acid

Synonyms: 2,4,5-TCPPA

Molecular

Formula: $C_9H_7Cl_3O_3$



Chemical Properties

Molecular Weight: 269.5

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point: 180.4 to 181.6°C

Density: 1.640

Solubility: Slightly (140 ppm H_2O at 25°C)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—dangerous—chlorides

PRODUCTION DATA

Annual U.S.

Production: 3×10^6 lbs.

Consumption:

Fraction of

Dispersion: Estimated as 1.0

Fraction of Pro-

duction Lost: 0.015

Release Rate (million lbs/yr): 3.0

TOXICITY DATA

Acute Toxicity

LD₅₀

Dosage

375-1200 mg/kg

650 mg/kg

650 mg/kg

650 mg/kg

Animal

rat

rat

mammal

mammal

Route

oral

oral

oral

unreported

Low toxicity to man

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Sodium acetate

CHEMICAL NAME

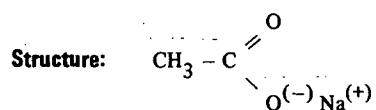
CAS Number: 127-09-3

Chemical Name: Acetic acid, sodium salt

Synonyms:

Molecular

Formula: $\text{C}_2\text{H}_3\text{O}_2 \cdot \text{Na}$



Chemical Properties

Molecular Weight: 83.06

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point: 324°C

Density: 1.528

Solubility: Soluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD: 45% of theoretical

Atmospheric Reactivity:

Safety Hazard:

Sodium acetate

PRODUCTION DATA

Annual U.S.
Production: 16.5×10^6 lbs. (1968)

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	3530 mg/kg	rat	oral
	8000 mg/kg	mouse	subcutaneous
	335 mg/kg	mouse	intravenous
LD _{Lo}	3000 mg/kg	dog	intravenous

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Sodium benzoate

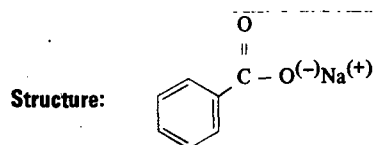
CHEMICAL NAME

CAS Number: 532-32-1

Chemical Name: Benzoic acid, sodium salt

Synonyms: Benzoate of soda

Molecular Formula: $C_7H_5O_2 \cdot Na$



Chemical Properties

Molecular Weight: 144.1

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point:

Density:

Solubility: Soluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Sodium benzoate

PRODUCTION DATA

Annual U.S.
Production: ca. 6×10^6 lbs. (1975)

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	4100 mg/kg	rat	oral
	2000 mg/kg	rabbit	oral
LD _{Lo}	2000 mg/kg	rabbit	subcutaneous
	1400 mg/kg	guinea pig	intraperitoneal
	100 mg/kg	frog	subcutaneous

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Sodium carboxymethylcellulose

CHEMICAL NAME

CAS Number: 9004-32-4

Chemical Name: Cellulose, carboxymethyl ether, sodium salt

Synonyms: Sodium carboxymethylcellulose Cellulose gum
CMC CM cellulose
Sodium cellulose glycolate

Molecular Formula: (Exact composition unknown or undetermined)

Structure: A synthetic cellulose gum containing 0.4 to 1.5 sodium carboxymethyl group ($-\text{CH}_2\text{COO Na}$) per glucose unit of the cellulose

Chemical Properties

Molecular Weight: ca. 21,000 to 500,000

Physical State: Solid

Vapor Pressure: < 0.6 mm at 25°C

Vapor Density:

Boiling Point: Decomposes

Melting Point:

Density:

Solubility: Soluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Sodium carboxymethylcellulose

PRODUCTION DATA

Annual U.S.
Production: 69.0 x 10⁶ lbs.

Consumption: 69.0 x 10⁶ lbs.

Fraction of
Dispersion: 1.0

Fraction of Pro-
duction Lost: 0.03

Release Rate (million lbs/yr): 71.0

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
----------------	--------	--------	-------

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Neoplasm:

TD_{Lo}

8600 mg/kg (19 weeks) rat

subcutaneous

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Sodium chloroacetate

CHEMICAL NAME

CAS Number: 3926-62-3

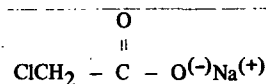
Chemical Name: Chloroacetic acid, sodium salt

Synonyms:

Molecular

Formula: $\text{C}_2\text{H}_2\text{ClO}_2 \cdot \text{Na}$

Structure:



Chemical Properties

Molecular Weight: 116.49

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: 200°C (decomposes)

Melting Point:

Density:

Solubility: Soluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Sodium chloroacetate

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
76 mg/kg
165 mg/kg
109 mg/kg
80 mg/kg
100 mg/kg

Animal
rat
mouse
mouse
guinea pig
mammal

Route
oral
oral
intravenous
oral
oral

LD_{Lo}

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Sodium formate

CHEMICAL NAME

CAS Number: 141-53-7

Chemical Name: Formic acid, sodium salt

Synonyms:

Molecular Formula: $\text{CHO}_2 \cdot \text{Na}$

Structure: $\begin{array}{c} \text{O} \\ \parallel \\ \text{HC} \\ \backslash \\ \text{O}^{(-)} \text{Na}^{(+)} \end{array}$

Chemical Properties

Molecular Weight: 68.01

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: 253°C (decomposes)

Melting Point: 253°C

Density: 1.92 at 20°C

Solubility: Soluble (440 gm/l H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD: 42% of theoretical

Atmospheric Reactivity:

Safety Hazard:

Fire—slight

Sodium formate

PRODUCTION DATA

Annual U.S. Production:	32.0 x 10 ⁶ lbs.	Consumption:	32.0 x 10 ⁶ lbs.
Fraction of Dispersion:	0.70	Fraction of Production Lost:	0.015
Release Rate (million lbs/yr):	22.9		

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	807 mg/kg	mouse	intravenous
	2500 mg/kg	mouse	unreported
LD _{Lo}	4000 mg/kg	dog	oral
	3000 mg/kg	dog	intravenous

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Sodium phenate

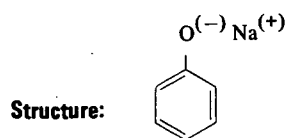
CHEMICAL NAME

CAS Number: 139-02-6

Chemical Name: Phenol, sodium salt

Synonyms: Sodium phenolate
Sodium carbolate
Sodium phenylate

Molecular Formula: C_6H_5NaO



Chemical Properties

Molecular Weight: 116.0

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point:

Density:

Solubility: Soluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Decomposed by CO_2 of the air

Safety Hazard:

Sodium phenate

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

Other Chronic Effects:

TLV:

Sorbic acid

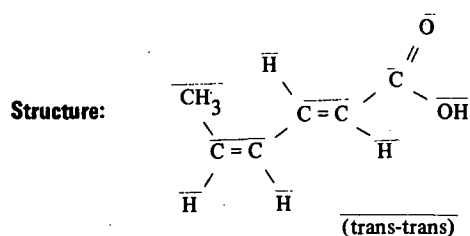
CHEMICAL NAME

CAS Number: 110-44-1

Chemical Name: Sorbic acid

Synonyms: 2,4-Hexadienoic acid
1,3-Pentadiene-1-carboxylic acid
2-Propenylacrylic acid

Molecular Formula: $C_6H_8O_2$



Chemical Properties (trans-trans)

Molecular Weight: 112.12

Physical State: Solid

Vapor Pressure: <0.01 mm at 20°C

Vapor Density: 3.87

Boiling Point: 228°C (decomposes)

Melting Point: 134.5°C

Density: 1.204 at 19°C/4°C

Solubility: Soluble (2.5 gm/1 H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD: 70% of theoretical after 10 days at 20°C

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—slight

Sorbic acid

PRODUCTION DATA

Annual U.S.
Production: 40×10^6 lbs.

Consumption: 40×10^6 lbs.

Fraction of
Dispersion: 0.50

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 20.6

TOXICITY DATA

Acute Toxicity

LD_{Lo}
LD₅₀

Dosage

5000 mg/kg
7400 mg/kg

Animal

human
rat

Route

unreported
oral

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

TD_{Lo}

2600 mg/kg (65 weeks) (rat

subcutaneous

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Sorbitol

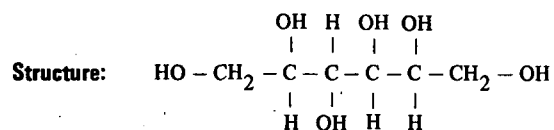
CHEMICAL NAME

CAS Number: 50-70-4

Chemical Name: D-Glucitol

Synonyms: Hexahydric alcohol
Sorbol

**Molecular
Formula:** $C_6H_{14}O_6$



Chemical Properties

Molecular Weight: 182.18

Physical State: Solid

Vapor Pressure: Negligible

Vapor Density:

Boiling Point: 295°C at 3.5 mm

Melting Point: 110 to 112°C (anhydrous)

Density: 1.489 at 20°C/4°C

Solubility: Very soluble (2350 gm/l H_2O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Sorbitol

PRODUCTION DATA

Annual U.S.
Production: 84.1×10^6 lbs. (1968)

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 52.2

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Styrene monomer

CHEMICAL NAME

CAS Number: 100-42-5

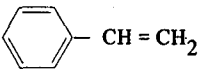
Chemical Name: Styrene

Synonyms: Phenylethylene
Vinyl benzene

Cinnamine

Molecular

Formula: C_8H_8

Structure:  $CH=CH_2$

Chemical Properties

Molecular Weight: 104.14

Physical State: Liquid

Vapor Pressure: 6.05 mm at 25°C

Vapor Density:

Boiling Point: 146°C at 760 mm

Melting Point: -30.63°C

Density: 0.9045 at 25°C/25°C

Solubility: Insoluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD: 87% of theoretical after 20 days at 20°C

Total theoretical oxygen demand = 3.1 gm/gm

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—moderate

Disaster hazard—dangerous—toxic fumes

Styrene monomer

PRODUCTION DATA

Annual U.S. Production: 4394.0×10^6 lbs. (1975) **Consumption:** 4394.0×10^6 lbs.

Fraction of Dispersion: 0 **Fraction of Production Lost:** 0.015

Release Rate (million lbs/yr): 89.1

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	5000 mg/kg	rat	oral
	216 mg/kg	mouse	oral
LC _{Lo}	10,000 ppm (30 months)	human	inhalation
	5,000 ppm	rat	inhalation
	10,000 ppm	mouse	inhalation
	12 gm/m ³ (14 hours)	guinea pig	inhalation

Non-lethal Acute Effects:

Irritant			
TC _{Lo}	600 ppm	human	inhalation
Central nervous system			
TC _{Lo}	376 ppm	human	inhalation
Glandular			
TC _{Lo}	20 mg/m ³	woman	inhalation
Lachrymation and violent itching of the eyes			
Weakness			
Stupor			
Incoordination			
Tremors			
Unconsciousness			

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 100 ppm
Ceiling concentration 200 ppm
Peak concentration 600 ppm/5 minutes/3 hours

Carcinogenicity:

Mutagenicity:

Teratogenicity: TLV: 100 ppm

Other Chronic Effects:

Succinic acid

CHEMICAL NAME

CAS Number: 110-15-6

Chemical Name: Succinic acid

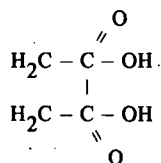
Synonyms: Ethylene succinic acid
Ethylene dicarboxylic acid

Butanedioic acid

Molecular

Formula: C₄H₆O₄

Structure:



Chemical Properties

Molecular Weight: 118.09

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: 235°C (decomposes)

Melting Point: 188°C

Density: 1.564 at 15°C/4°C

Solubility: Slightly (H₂O)
Very soluble (hot H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—slight

Succinic acid

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
LD_{Lo}

Dosage
2000 mg/kg

Animal
frog

Route
subcutaneous

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Succinonitrile

CHEMICAL NAME

CAS Number: 110-61-2

Chemical Name: Succinonitrile

Synonyms: Butanedinitrile
Ethylenedicyanide

**Molecular
Formula:** $C_4H_4N_2$

Structure:

$$\begin{array}{c} H_2C - C \equiv N \\ | \\ H_2C - C \equiv N \end{array}$$

Chemical Properties

Molecular Weight: 80.09

Physical State: Solid

Vapor Pressure: 2 mm at 100°C

Vapor Density: 270°C

Boiling Point: 267°C at 760 mm

Melting Point: 57 to 57.5°C

Density: 1.022 at 20°C

Solubility: Very soluble (H_2O)

**Octanol/Water Parti-
tion Coefficient:** 0.35

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Disaster hazard—dangerous—toxic fumes of cyanides

Succinonitrile

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

LD₅₀

LD_{Lo}

Dosage

100 mg/kg

150 mg/kg

36 mg/kg

2200 mg/kg

1000 mg/kg

Animal

rat

dog

rabbit

pigeon

frog

Route

intraperitoneal

unreported

unreported

unreported

subcutaneous

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Sulfanilic acid

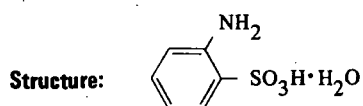
CHEMICAL NAME

CAS Number: 88-21-1

Chemical Name: o-Aminobenzenesulfonic acid

Synonyms: Sulfanilic acid
Orthanilic acid

Molecular Formula: $C_6H_7NO_3S \cdot H_2O$



Chemical Properties

Molecular Weight: 191.2

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point: 288°C (decomposes)

Density: 1.485 at 25°C/4°C

Solubility: Slightly (hot H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—dangerous—toxic fumes—NO_x and SO_x

Sulfanilic acid

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Non-lethal Acute Effects:

Slight irritation

Low toxicity

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Sulfolane

CHEMICAL NAME

CAS Number: 126-33-0

Chemical Name: Tetrahydrothiophene-1,1-dioxide

Synonyms: Sulfolane

Tetramethylene sulfone

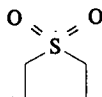
Cyclocyclic tetramethylene sulfone

Cyclo tetramethylene sulfone

Molecular

Formula: C₄H₈O₂S

Structure:



Chemical Properties

Molecular Weight: 120.18

Physical State: Liquid

Vapor Pressure: 0.01 mm at 20°C

Vapor Density:

Boiling Point: 285°C

Melting Point: 27°C

Density: 1.261 at 30°C/4°C

Solubility: Infinite (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Reacts slowly with RO₂ and O₃

Activity toward OH: t_{1/2} = 2 days

Safety Hazard:

Sulfolane

PRODUCTION DATA

Annual U.S. Production: 35.0 x 10⁶ lbs. **Consumption:** 35.0 x 10⁶ lbs.
Fraction of Dispersion: Estimated as 1.0 **Fraction of Production Lost:** 0.015
Release Rate (million lbs/yr): 35.5

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	1540 mg/kg	rat	oral
	1900 mg/kg	mouse	oral
	3180 mg/kg	rabbit	skin

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Sulfosuccinic, bis(2-ethylhexyl) ester, sodium salt

CHEMICAL NAME

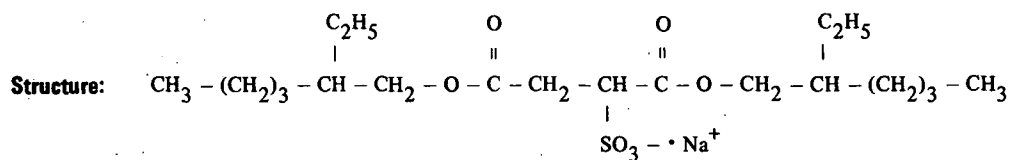
CAS Number: 577-11-7

Chemical Name: Sulfobutanedioic acid, 1,4-bis(2-ethylhexyl)ester, sodium salt

Synonyms:

Molecular

Formula: $C_{20}H_{37}O_7S \cdot Na$



Chemical Properties

Molecular Weight: 445.64

Physical State:

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point:

Density:

Solubility:

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Sulfosuccinic, bis(2-ethylhexyl) ester, sodium salt

PRODUCTION DATA

**Annual U.S.
Production:** 12.4 x 10⁶ lbs.

Consumption: 12.4 x 10⁶ lbs.

**Fraction of
Dispersion:** 1.0

**Fraction of Pro-
duction Lost:** 0.03

Release Rate (million lbs/yr): 12.8

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
1900 mg/kg
4800 mg/kg
60 mg/kg

Animal
rat
mouse
mouse

Route
oral
oral
intravenous

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Sutan

CHEMICAL NAME

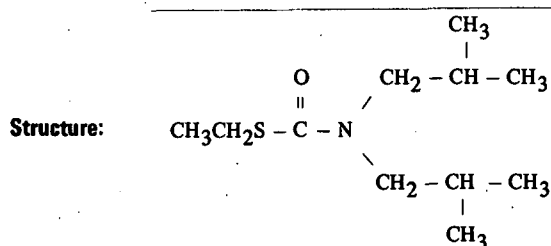
CAS Number: 2008-41-5

Chemical Name: Bis(2-methylpropyl)carbamothioic acid, S-ethyl ester

Synonyms: S-Ethyl-diisobutylthiocarbamate

Molecular

Formula: $C_{11}H_{23}NOS$



Chemical Properties

Molecular Weight: 217.41

Physical State: Liquid

Vapor Pressure: 13×10^{-3} mm at 25°C

Vapor Density:

Boiling Point:

Melting Point:

Density: 0.9402 at $25^\circ\text{C}/25^\circ\text{C}$

Solubility: 45 ppm H_2O at 22°C

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

PRODUCTION DATA

**Annual U.S.
Production:** 6.0×10^6 lbs.

Consumption:

**Fraction of
Dispersion:** Estimated as 1.0

**Fraction of Pro-
duction Lost:** 0.015

Release Rate (million lbs/yr): 6.0

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
5366 mg/kg
4000 mg/kg

Animal
rat
rat

Route
oral
oral

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

TBA

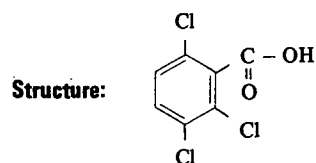
CHEMICAL NAME

CAS Number: 50-31-7

Chemical Name: 2,3,6-Trichlorobenzoic acid

Synonyms: 2,3,6-TCB
2,3,6-TBA

**Molecular
Formula:** $C_7H_3Cl_3O_2$



Chemical Properties

Molecular Weight: 225.46

Physical State: Solid

Vapor Pressure: Negligible

Vapor Density:

Boiling Point:

Melting Point: 124 to 125°C (pure compound)

Density:

87 to 99°C (commercial mixture)

Solubility: Slightly soluble (0.84 gm/100 ml H_2O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity: Relatively stable to ultraviolet decomposition

Safety Hazard:

TBA

PRODUCTION DATA

**Annual U.S.
Production:** 2.0 x 10⁶ lbs.

Consumption:

**Fraction of
Dispersion:** Estimated as 1.0

**Fraction of Pro-
duction Lost:** 0.015

Release Rate (million lbs/yr): 2.0

TOXICITY DATA

Acute Toxicity LD ₅₀	Dosage	Animal	Route
	1644 mg/kg	rat	oral
	650 mg/kg	rat	oral
	1000 mg/kg	rat	intraperitoneal
	615 mg/kg	mouse	oral
	1500 mg/kg	mouse	subcutaneous
	812 mg/kg	rabbit	oral
	1218 mg/kg	guinea pig	oral
	700 mg/kg	mammal	unreported

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

TCA

CHEMICAL NAME

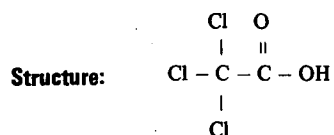
CAS Number: 76-03-9

Chemical Name: Trichloroacetic acid

Synonyms: TCA

Molecular

Formula: $C_2HCl_3O_2$



Chemical Properties

Molecular Weight: 163.38

Physical State: Solid

Vapor Pressure: 5 mm at 77°C

Vapor Density:

Boiling Point: 197.55°C at 760 mm

Melting Point: 55 to 58°C

Density: 1.62 at 25°C/4°C

Solubility: Very soluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

PRODUCTION DATA

Annual U.S.
Production: 1.0×10^6 lbs.

Fraction of
Dispersion: Estimated as 1

Release Rate (million lbs/yr): 1.0

Consumption:

Fraction of Pro-
duction Lost: 0.015

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	3320 mg/kg	rat	oral
LD _{Lo}	500 mg/kg	mouse	intraperitoneal

Non-lethal Acute Effects:

May cause skin burns upon prolonged contact

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Irritant to nose and throat

Terephthalic acid

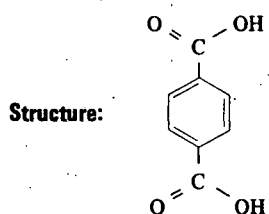
CHEMICAL NAME

CAS Number: 100-21-0

Chemical Name: Terephthalic acid

Synonyms: p-Phthalic acid
TPA
Benzene-p-dicarboxylic acid

Molecular Formula: $C_8H_6O_4$



Chemical Properties

Molecular Weight: 166.14

Vapor Pressure: Negligible

Boiling Point: Sublimes

Density: 1.51

Octanol/Water Partition Coefficient:

Physical State: Solid

Vapor Density:

Melting Point: $>300^\circ$ sublimes without melting

Solubility: Insoluble (H_2O)

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Terephthalic acid

PRODUCTION DATA

Annual U.S. Production:	4644.1 x 10 ⁶ lbs. (1975)	Consumption:	4644 x 10 ⁶ lbs.
Fraction of Dispersion:	0	Fraction of Production Lost:	0.015
Release Rate (million lbs/yr):	28.9		

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	1430 mg/kg	mouse	intraperitoneal
LD ₁₀	767 mg/kg	dog	intravenous

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Termik

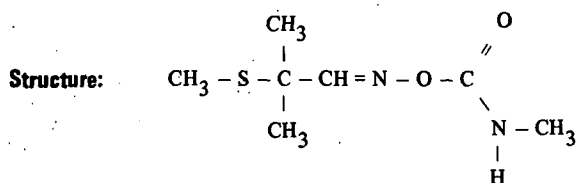
CHEMICAL NAME

CAS Number: 116-06-3

Chemical Name: 2-Methyl-2(methylthio)propionaldehyde-O-(methyl-carbamoyl)oxime

Synonyms: Termik
Aldicarb

Molecular Formula: C₇H₁₄N₂O₂S



Chemical Properties

Molecular Weight: 190.1

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point: 100°C

Density:

Solubility:

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

PRODUCTION DATA

Annual U.S.
Production: 2.0×10^6 lbs.

Consumption:

Fraction of
Dispersion: Estimated as 1.0

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 2.0

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	0.93 mg/kg	rat	oral
	5 mg/kg	rabbit	skin
	1 mg/kg	rat	oral
	2500 µg/kg	rat	skin
	930 µg/kg	rat	unreported
	300 µg/kg	mouse	oral
	1400 mg/kg	rabbit	skin
	4440 µg/kg	duck	oral
LD _{Lo}	666 µg/kg	rat	subcutaneous

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

1, 1, 1, 2-Tetrachloro-2, 2-difluoroethane

CHEMICAL NAME

CAS Number: 76-12-0

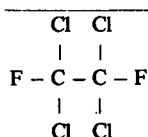
Chemical Name: 1,1,2,2-Tetrachloro-1,2-difluoroethane

Synonyms: Tetrachlorodifluoroethane

Molecular

Formula: $C_2Cl_4F_2$

Structure:



Chemical Properties

Molecular Weight: 203.83

Physical State: Liquid

Vapor Pressure: 52.53 mm at 25°C

Vapor Density: 7.03

Boiling Point: 93°C at 760 mm

Melting Point: 25°C

Density: 1.6447 at 25°C/4°C

Solubility: Insoluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Stable in lower atmosphere

Safety Hazard:

Disaster hazard—dangerous—toxic fumes of chlorides and fluorides

1, 1, 1, 2-Tetrachloro-2, 2-difluoroethane

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

**Acute Toxicity
LC₅₀**

**Dosage
10,000 ppm (7 hours)**

**Animal
rat**

**Route
inhalation**

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

1, 1, 2, 2-Tetrachloro-1, 2-difluoroethane

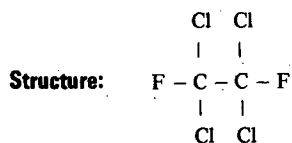
CHEMICAL NAME

CAS Number: 76-12-0

Chemical Name: 1,1,2,2-Tetrachloro-1,2-difluoroethane

Synonyms: 1,2-Difluoro-1,1,2,2-tetrachloroethane Freon 112
sym-Tetrachlorodifluoroethane Genetron 112
F-112

Molecular Formula: $C_2Cl_4F_2$



Chemical Properties

Molecular Weight: 208.83

Physical State: Solid or liquid

Vapor Pressure:

Vapor Density:

Boiling Point: 93°C at 760 mm

Melting Point: 25°C

Density: 1.6447 at 25°C/4°C

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Stable in lower atmosphere

Safety Hazard:

1, 1, 2, 2-Tetrachloro-1, 2-difluoroethane

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Tetrachloronaphthalene

CHEMICAL NAME

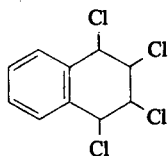
CAS Number: 605-36-7

Chemical Name: 1,2,3,4-Tetrachloro-1,2,3,4-tetrahydronaphthalene

Synonyms:

**Molecular
Formula:** $C_{10}H_8Cl_4$

Structure:



Chemical Properties

Molecular Weight: 269.99

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point: 182°C

Density:

Solubility:

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—dangerous; when heated to decomposition produces toxic fumes

Tetrachloronaphthalene

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Non-lethal Acute Effects:

Systemic effects

TC_{Lo}

3 mg/m³

human

inhalation

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 2 mg/m³ (skin)

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Tetrachlorophthalic anhydride

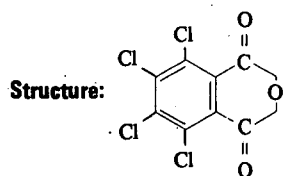
CHEMICAL NAME

CAS Number: 117-08-8

Chemical Name: Tetrachlorophthalic anhydride

Synonyms:

Molecular Formula: $C_8Cl_4O_3$



Chemical Properties

Molecular Weight: 285.90

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: 371°C (sublimes)

Melting Point: 255 to 256.5°C

Density:

Solubility: Slightly (decomposes in hot H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Tetrachlorophthalic anhydride

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Tetraethyl lead

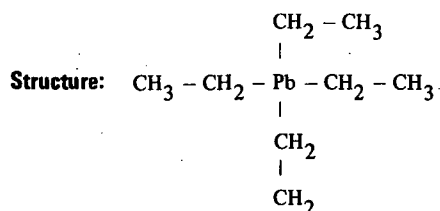
CHEMICAL NAME

CAS Number: 78-00-2

Chemical Name: Tetraethylplumbane

Synonyms: Tetraethyl lead
TEL

Molecular Formula: $C_8H_{20}Pb$



Chemical Properties

Molecular Weight: 323.44

Physical State: Liquid

Vapor Pressure: 1 mm at 28.4°C

Vapor Density:

Boiling Point: 200°C (decomposes)

Melting Point: -136.8°C

Density: 1.659 at 11°C

Solubility: Insoluble (2×10^{-4} g/1 H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

With O₃: $t_{1/2}$ = 2-3 days

With RO₂: slow to react in water

With OH: $t_{1/2}$ = 2-3 days

Safety Hazard:

Fire—moderate

Tetraethyl lead

PRODUCTION DATA

Annual U.S.**Production:** 353.0×10^6 lbs. (1973)**Consumption:** 280.4×10^6 lbs.**Fraction of****Dispersion:** 1.0**Fraction of Pro-****duction Lost:** 0.015**Release Rate (million lbs/yr):** 14.6

TOXICITY DATA

Acute ToxicityLD₅₀LD_{Lo}**Dosage**

15 mg/kg

17 mg/kg

10 mg/kg

31 mg/kg

86 mg/kg

500 mg/kg

23 mg/kg

990 mg/kg

Animal

rat

rat

rat

rat

mouse

dog

rabbit

guinea pig

Route

parenteral

oral

intraperitoneal

intravenous

subcutaneous

skin

intravenous

skin

Chronic Toxicity**U.S. Occupational Standard:****Carcinogenicity:**TD_{Lo}

86 mg/kg (21 days)

mouse

subcutaneous

Mutagenicity: No information**Teratogenicity:** Positive—rat—oral**TLV:** 0.0117 mg/m^3 **Other Chronic Effects:**

Metabolic disturbances

Nervous system disorders

Inhibition of DNA synthesis

Decreased ACHase activity

Tetrahydrofuran

CHEMICAL NAME

CAS Number: 109-99-9

Chemical Name: Tetrahydrofuran

Synonyms: Cyclotetramethylene oxide
1,4 Epoxy-butane
Hydrofuron

Butane α,δ -oxide
Butylene oxide
Diethylene oxide

Oxacyclopentane
Tetramethylene oxide
Oxolane
Furanidine

Molecular Formula: C₄H₈O

Structure:



Chemical Properties

Molecular Weight: 72.10

Physical State: Liquid

Vapor Pressure: 143 mm at 20°C

Vapor Density: 2.5

Boiling Point: 67°C

Melting Point: -65°C

Density: 0.8892 at 20°C/4°C

Solubility: Soluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Forms peroxides readily

Safety Hazard:

Fire—dangerous

Explosion—moderate

Tetrahydrofuran

PRODUCTION DATA

Annual U.S. Production: 59.0×10^6 lbs.
(90×10^6 lbs., 1975 estimate)

Consumption: 59.0×10^6 lbs.

Fraction of Dispersion: 0.70

Fraction of Production Lost: 0.015

Release Rate (million lbs/yr): 42.2

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD _{Lo}	3000 mg/kg	rat	oral
	500 mg/kg	rat	intraperitoneal

Non-lethal Acute Effects:
Narcotic
Irritant to eyes, skin and respiratory tract

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 200 ppm

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 200 ppm

Other Chronic Effects:

Tetrahydronaphthalene

CHEMICAL NAME

CAS Number: 119-64-2

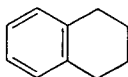
Chemical Name: 1,2,3,4-Tetrahydronaphthalene

Synonyms: Tetralin

Molecular

Formula: C₁₀H₁₂

Structure:



Chemical Properties

Molecular Weight: 132.21

Physical State: Liquid

Vapor Pressure: 1 mm at 38.0°C

Vapor Density: 4.55

Boiling Point: 207.57°C at 760 mm

Melting Point: -35.79°C

Density: 0.9702 at 20°C/4°C

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Fire—moderate

Tetrahydronaphthalene

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

LD₅₀
LD₁₀

Dosage

2860 mg/kg
275 ppm (8 hours
for 17 days)

Animal

rat
guinea pig

Route

oral
inhalation

Non-lethal Acute Effects:

Local irritant
Narcotic in high concentrations

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Cataracts and kidney injury

Tetrahydrophthalic anhydride

CHEMICAL NAME

CAS Number: 85-43-8

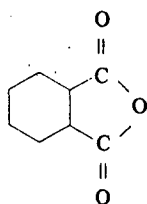
Chemical Name: 4-Cyclohexene-1,2-dicarboxylic acid

Synonyms: Tetrahydrophthalic anhydride

Molecular

Formula: $C_8H_8O_3$

Structure:



Chemical Properties

Molecular Weight: 152.14

Physical State: Solid

Vapor Pressure: <0.01 mm at 20°C

Vapor Density: 5.25

Boiling Point: 195°C at 50 mm

Melting Point:

Density: 1.375 at 25°C/20°C

Solubility: Insoluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Tetrahydrophthalic anhydride

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

**Acute Toxicity
LD_{Lo}**

**Dosage
500 mg/kg**

**Animal
mouse**

**Route
intraperitoneal**

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Tetramethylethylenediamine

CHEMICAL NAME

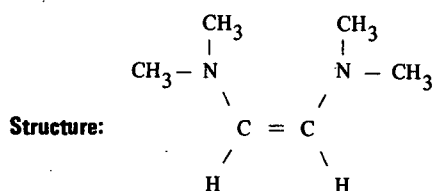
CAS Number: 110-18-9

Chemical Name: N,N,N',N'-Tetramethylethylenediamine

Synonyms: N,N,N',N'-Tetramethyl-1,2-diaminoethane

Molecular

Formula: C₆H₁₆N₂



Chemical Properties

Molecular Weight: 116.24

Physical State: Liquid

Vapor Pressure:

Vapor Density:

Boiling Point: 121 to 122°C

Melting Point: -55.1°C

Density: 0.7765 at 20°C/4°C

Solubility: Soluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Tetramethylethylenediamine

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
LD_{Lo}

Dosage
1580 mg/kg

Animal
rat

Route
oral

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Tetramethyl lead

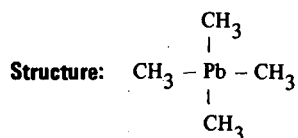
CHEMICAL NAME

CAS Number: 75-74-1

Chemical Name: Tetramethyl plumbane

Synonyms: Tetramethyl lead
Lead tetramethyl
TML

Molecular Formula: $C_4H_{12}Pb$



Chemical Properties

Molecular Weight: 267.33

Physical State: Liquid

Vapor Pressure: 6.0 mm at 10°C

Vapor Density: 9.2

Boiling Point: 110°C at 10 mm

Melting Point: 27.5°C

Density: 1.995

Solubility: Insoluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts vigorously with oxidizing materials

Safety Hazard:

Fire—dangerous

Explosion—moderate

Tetramethyl lead

PRODUCTION DATA

Annual U.S. Production: 972.5×10^6 lbs.
(organo lead compounds)

Consumption: 900×10^6 lbs.
(organo lead compounds)

Fraction of Dispersion: 1.0

Fraction of Production Lost: 0.015

Release Rate (million lbs/yr): 14.6 (tetramethyl lead)

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	109 mg/kg	rat	oral
	105 mg/kg	rat	parenteral
LD _{Lo}	73 mg/kg	rat	intraperitoneal
	90 mg/kg	rabbit	intravenous

Can be fatal if swallowed

Chronic Toxicity

U.S. Occupational Standard: (air) TWA $90 \mu\text{g}/\text{m}^3$ (skin)

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: $90 \mu\text{g}/\text{m}^3$

Other Chronic Effects:

Tetramethyl succinonitrile

CHEMICAL NAME

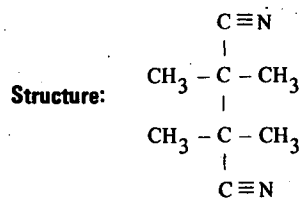
CAS Number: 3333-52-6

Chemical Name: Tetramethyl succinonitrile

Synonyms: TSN

Molecular

Formula: $C_8H_{12}N_2$



Chemical Properties

Molecular Weight: 136.20

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point: 170.5 to 171.5°C

Density: 1.070

Solubility:

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Tetramethyl succinonitrile

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
LC_{Lo}

Dosage
60 ppm

Animal
rat

Route
inhalation

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 3 mg/m³ (skin)

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Tetranitromethane

CHEMICAL NAME

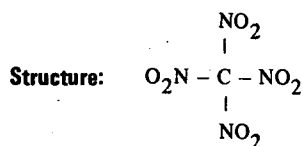
CAS Number: 509-14-8

Chemical Name: Tetranitromethane

Synonyms:

Molecular

Formula: CN_4O_8



Chemical Properties

Molecular Weight: 196.03

Physical State: Liquid

Vapor Pressure: 1 mm at 22.7°C

Vapor Density:

Boiling Point: 126°C

Melting Point: 14.2°C

Density: 1.6380 at 20°C/4°C

Solubility: Insoluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—dangerous

Explosion—severe

Disaster hazard—severe—toxic fumes— NO_x

Tetranitromethane

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

LC_{Lo}

LD_{Lo}

Dosage

33 ppm (6 hours)

500 mg/kg

Animal

rat

mammal

Route

inhalation

inhalation

Non-lethal Acute Effects:

Irritant to eyes and respiratory passages

Pulmonary edema

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 1 ppm

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 1 ppm

Other Chronic Effects:

Liver damage

Kidney damage

Tetrapropylene

CHEMICAL NAME

CAS Number: 112-41-4

Chemical Name: 1-Dodecene

Synonyms: α -Dodecene

Molecular

Formula: $C_{12}H_{24}$

Structure: $CH_3(CH_2)_9CH=CH_2$

Chemical Properties

Molecular Weight: 168.33

Physical State: Liquid

Vapor Pressure:

Vapor Density:

Boiling Point: 213.4°C at 760 mm

Melting Point: -35.23°C

Density: 0.7584 at 20°C/4°C

Solubility: Insoluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Tetrapropylene

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Tetryl

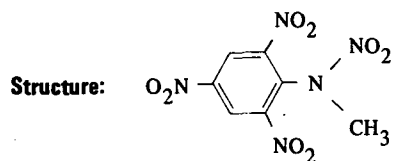
CHEMICAL NAME

CAS Number: 479-45-8

Chemical Name: N-Methyl-N,2,4,6-tetranitroaniline

Synonyms: Tetryl
Tetralite
Trinitrophenylmethylnitramine
Nitramine

Molecular Formula: $C_7H_5N_5O_8$



Chemical Properties

Molecular Weight: 287.15

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: Explodes at 187°C

Melting Point: 131 to 132°C

Density: 1.57 at 19°C

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Fire—dangerous
Explosion—severe

PRODUCTION DATA**Annual U.S.
Production:****Consumption:****Fraction of
Dispersion:****Fraction of Pro-
duction Lost:****Release Rate (million lbs/yr):****TOXICITY DATA****Acute Toxicity**LD₅₀LD_{Lo}**Dosage**

500 mg/kg

5000 mg/kg

Animal

dog

dog

Route

subcutaneous

subcutaneous

Non-lethal Acute Effects:

Dermatitis

Conjunctivitis

Nausea and vomiting

Chronic Toxicity**U.S. Occupational Standard:** (air) TWA 1.5 mg/m³ (skin)**Carcinogenicity:****Mutagenicity:****Teratogenicity:****TLV:** 1.5 mg/m³ (skin)**Other Chronic Effects:**

Anemia

Gastrointestinal conditions

Thiuram

CHEMICAL NAME

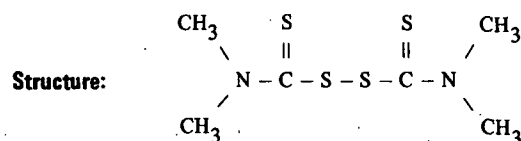
CAS Number: 137-26-8

Chemical Name: Bis(dimethyl thiocarbamoyl)disulfide

Synonyms: Tetramethyl thiuramdisulfide
Disulfuram
TTD

Thiouram

Molecular Formula: $C_6H_{12}N_2S_4$



Chemical Properties

Molecular Weight: 240.44

Physical State: Solid

Vapor Pressure: Negligible

Vapor Density:

Boiling Point: 129°C at 20 mm

Melting Point: 155 to 156°C

Density: 1.30 at 20°C

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—dangerous—NO_x and SO_x

Thiuram

PRODUCTION DATA

Annual U.S.**Production:** 15.7×10^6 lbs. (1972)**Consumption:****Fraction of
Dispersion:****Fraction of Pro-
duction Lost:** 0.015**Release Rate (million lbs/yr):**

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	560 mg/kg	rat	oral
	1350 mg/kg	mouse	oral
	210 mg/kg	rabbit	oral
	780 mg/kg	mammal	unknown
LD _{Lo}	200 mg/kg	mouse	intraperitoneal
	230 mg/kg	cat	oral

Non-lethal Acute Effects:

Liver and kidney injury
Brain damage
Irritation of eyes, nose and throat

Chronic Toxicity**U.S. Occupational Standard:** (air) TWA 5 mg/m^3 **Carcinogenicity:****Mutagenicity:****Teratogenicity:**

TD_{Lo} 250 mg/kg (6-17 days of pregnancy)
250 mg/kg (8 days of pregnancy)

TLV: 5 mg/m^3 (air)

mouse oral
hamster oral

Other Chronic Effects:

o-Tolidine

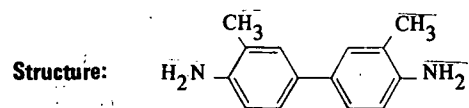
CHEMICAL NAME

CAS Number: 119-93-7

Chemical Name: 3,3'-Dimethylbenzidine

Synonyms: o-Tolidine
3,3'-Dimethyldiphenyl-4,4'-diamine

**Molecular
Formula:** C₁₄H₁₆N₂



Chemical Properties

Molecular Weight: 212.30

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point: 131 to 132°C

Density:

Solubility: Slightly (H₂O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

o-Tolidine

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

LD₅₀

LD_{Lo}

Dosage

404 mg/kg

125 mg/kg

125 mg/kg

Animal

rat

rat

mouse

Route

oral

intraperitoneal

intraperitoneal

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Recognized carcinogen

TD

2250 mg/kg (30 days)

2880 mg/kg (34 weeks)

4480 mg/kg (1 year)

rat

rat

rat

oral

subcutaneous

implant

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Toluene

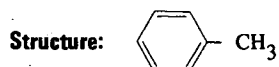
CHEMICAL NAME

CAS Number: 108-88-3

Chemical Name: Toluene

Synonyms: Methyl benzene
Phenyl methane
Toluol

Molecular Formula: C₇H₈



Chemical Properties

Molecular Weight: 92.15

Physical State: Liquid

Vapor Pressure: 28.4 mm at 25°C

Vapor Density: 3.14

Boiling Point: 110.6°C at 760 mm

Melting Point: -95°C

Density: 0.8669 at 20°C/4°C

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient: 2.80

Environmental Persistence

BOD: 86% of theoretical after 20 days at 20°C
Total theoretical oxygen demand = 3.13 gm/gm

Atmospheric Reactivity:
Reacts with oxidizing materials
Unreactive to O₃ and RO₂ (T_{1/2} = 10³ - 10⁶ days)
Reactive toward OH
No photochemical degradation

Safety Hazard:

Fire—dangerous
Explosion—moderate
Disaster hazard—moderate—toxic fumes

Toluene

PRODUCTION DATA

Annual U.S. Production: $6,937.9 \times 10^6$ lbs. (1974) **Consumption:** $5,420 \times 10^6$ lbs. (1975)

Fraction of Dispersion: 0.15 **Fraction of Production Lost:** 0.01

Release Rate (million lbs/yr): 1074.2

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	5400 mg/kg	rat	oral
	1640 mg/kg	rat	intraperitoneal
LC ₅₀	5300 ppm	mouse	inhalation
LD _{Lo}	800 mg/kg	rat	intraperitoneal
	5000 mg/kg	rat	subcutaneous
LC _{Lo}	4000 ppm (4 hours)	rat	inhalation

Non-lethal Acute Effects:

Central nervous system			
TC _{Lo}	200 ppm	human	inhalation
Psychotropic			
TC _{Lo}	100 ppm	man	inhalation

Chronic Toxicity

U.S. Occupational Standard: (air) NIOSH Recommended Standard:

TWA 200 ppm
Ceiling 300 ppm
Peak concentration 500 ppm/10 minutes

Carcinogenicity:

(Suspected) 100% solution mouse dermal

Mutagenicity:

Teratogenicity:

TLV:

Odor perception: 40 ppm

Other Chronic Effects:

Blood abnormalities
Bone marrow chromosome damage
Metabolic effects
Enzymatic effects
Increased liver microsomal enzymes

Toluene-2, 4-diamine

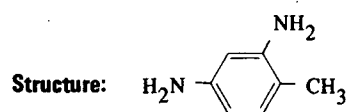
CHEMICAL NAME

CAS Number: 95-80-7

Chemical Name: Toluene-2,4-diamine

Synonyms: Tolyene diamine
2,4-Diaminotoluene

**Molecular
Formula:** $C_7H_{10}N_2$



Chemical Properties

Molecular Weight: 122.17

Physical State: Solid

Vapor Pressure: 1 mm at 106.5°C

Vapor Density:

Boiling Point: 292°C

Melting Point: 99°C

Density:

Solubility: Very soluble (hot H_2O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—moderate—toxic fumes

Toluene-2, 4-diamine

PRODUCTION DATA

Annual U.S.
Production: 63×10^6 lbs.

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
 LD_{Lo}

Dosage
500 mg/kg
50 mg/kg
200 mg/kg
350 mg/kg
400 mg/kg
200 mg/kg

Animal
rat
rat
dog
dog
rabbit
guinea pig

Route
oral
unreported
subcutaneous
unreported
unreported
unreported

Non-lethal Acute Effects:

Liver damage
Skin irritation
Anemia

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Neoplasm:

TD_{Lo}

280 mg/kg (35 weeks)

rat

subcutaneous

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Toluene diisocyanate

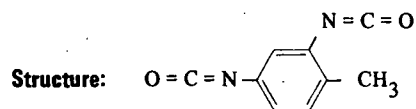
CHEMICAL NAME

CAS Number: 91-08-7

Chemical Name: Isocyanic acid, 2-methyl-m-phenylene ester

Synonyms: Isocyanic acid, methyl phenylene ester
TDI
2,4-Toluene diisocyanate

Molecular Formula: $C_9H_6N_2O_2$



Chemical Properties

Molecular Weight: 174.16

Physical State: Liquid

Vapor Pressure: <0.01 mm at 20°C

Vapor Density: 6.0

Boiling Point: 238.3°C

Melting Point: 19.5 to 21.5°C

Density: 1.22 at 20°C/4°C

Solubility: Reacts with H_2O producing CO_2

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Reacts slowly with O_3 and RO_2

$T_{1/2} OH = 3$ days

Hydrolyzes in H_2O (pH 7.0) $t_{1/2} = 0.5$ seconds

Safety Hazard:

Disaster hazard—dangerous—toxic fumes

Toluene diisocyanate

PRODUCTION DATA

Annual U.S.
Production: 420 x 10⁶ lbs.

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 6.3

TOXICITY DATA

Acute Toxicity
LC₅₀

Dosage
14 ppm (4 hours)
10 ppm (4 hours)
13 ppm (4 hours)

Animal
rat
mouse
guinea pig

Route
inhalation
inhalation
inhalation

Non-lethal Acute Effects:

Irritant

TC_{Lo}

0.5 ppm

human

inhalation

Pulmonary edema

Allergies produced severe dermatitis and bronchial spasms

Chronic Toxicity

U.S. Occupational Standard: (air) Ceiling-140 µg/m³

NIOSH recommends: (air) TWA 5 ppb

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 0.02 ppm—below level of odor perception

Other Chronic Effects:

Liver disease

Toluenesulfonamide

CHEMICAL NAME

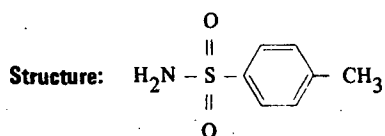
CAS Number: 70-55-3

Chemical Name: p-Toluene sulfonylamide

Synonyms: p-Toluene sulfonamide
4-Toluenesulfonic acid, amide

Molecular

Formula: C₇H₉NO₂S



Chemical Properties

Molecular Weight: 171.22

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point: 138.5 to 139°C

Density:

Solubility: Slightly (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Toluenesulfonamide

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
75 mg/kg
250 mg/kg

Animal
wild bird
mouse

Route
oral
intraperitoneal

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

o-Toluenesulfonic acid

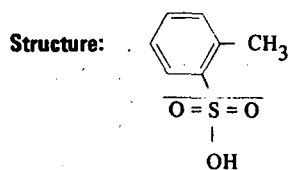
CHEMICAL NAME

CAS Number: 88-20-0

Chemical Name: o-Toluenesulfonic acid

Synonyms: o-Toluenesulfonate
2-Toluenesulfonic acid

Molecular Formula: C₇H₈O₃S



Chemical Properties

Molecular Weight: 172.21

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: 128.8°C at 25 mm

Melting Point: 67.5°C

Density:

Solubility: Very soluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

o-Toluenesulfonic acid

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Non-lethal Acute Effects:

High irritant

Moderate systemic toxicity

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

p-Toluenesulfonic acid

CHEMICAL NAME

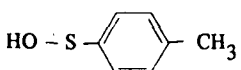
CAS Number: 104-15-4

Chemical Name: p-Toluenesulfonic acid

Synonyms: p-Toluene sulfonate

Molecular

Formula: $C_7H_8O_3S$

Structure: 

Chemical Properties

Molecular Weight: 172.21

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: 140°C at 20 mm

Melting Point: 104 to 105°C

Density:

Solubility: Very soluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

p-Toluenesulfonic acid

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
400 mg/kg

Animal
rat

Route
oral

Non-lethal Acute Effects:

High irritant
Moderate systemic toxicity

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Toluenesulfonyl chloride

CHEMICAL NAME

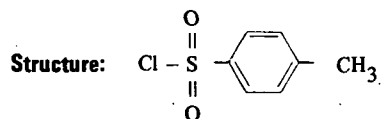
CAS Number: 98-59-9

Chemical Name: p-Toluenesulfonyl chloride

Synonyms:

Molecular

Formula: $C_7H_7ClO_2S$



Chemical Properties

Molecular Weight: 190.65

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: 145 to 146°C at 15 mm

Melting Point: 71°C

Density:

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Toluenesulfonyl chloride

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Non-lethal Acute Effects:

Severe irritant

Moderate systemic toxicity

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

m-Toluidine

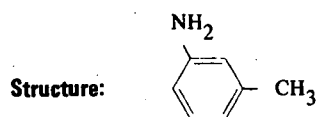
CHEMICAL NAME

CAS Number: 108-44-1

Chemical Name: m-Toluidine

Synonyms: m-Methyl aniline
3-Aminotoluene
3-Amino-1-methylbenzene

**Molecular
Formula:** C₇H₉N



Chemical Properties

Molecular Weight: 107.16

Physical State: Liquid

Vapor Pressure: 1 mm at 41°C

Vapor Density: 3.90

Boiling Point: 200.23°C at 760 mm

Melting Point: -14.7°C

Density: 0.9984 at 20°C/4°C

Solubility: Slightly (H₂O)

**Octanol/Water Parti-
tion Coefficient:** 1.60

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Disaster hazard—dangerous—toxic fumes

m-Toluidine

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
974 mg/kg
150 mg/kg

Animal
rat
mouse

Route
oral
intraperitoneal

Non-lethal Acute Effects:

Local irritant
Allergies
Headache
Irritation
Difficulty in breathing
Psychic disturbances
Marked irritation of the kidneys and bladder

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Neoplasm:

TD_{Lo}

6600 µg/kg (19 weeks)

rat

oral

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

o-Toluidine

CHEMICAL NAME

CAS Number: 95-53-4

Chemical Name: o-Toluidine

Synonyms: o-Methyl aniline
2-Methyl aniline
2-Amino toluene

**Molecular
Formula:** C₇H₉N



Chemical Properties

Molecular Weight: 107.16

Vapor Pressure: 1 mm at 44°C

Boiling Point: 200.23°C at 760 mm

Density: 0.9984 at 20°C/4°C

**Octanol/Water Parti-
tion Coefficient:** 1.61

Physical State: Liquid

Vapor Density: 3.69

Melting Point: -23.7°C (unstable)
-14.7°C (stable)

Solubility: Slightly (H₂O)

Environmental Persistence

BOD: 45% of theoretical

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—moderate

Disaster hazard—dangerous—toxic fumes

o-Toluidine

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	900 mg/kg	rat	oral
	150 mg/kg	mouse	intraperitoneal
	3250 mg/kg	rabbit	skin
LDLo	300 mg/kg	cat	oral
	5 mg/kg	frog	oral

Non-lethal Acute Effects:

Difficulty in breathing
Headache
Marked irritation of kidneys and bladder
Psychic disturbance

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 5 ppm (skin)

Carcinogenicity:

Neoplasm TDLo 8200 mg/kg (24 weeks) rat oral

Mutagenicity:

Teratogenicity:

TLV: 5 ppm (skin)

Other Chronic Effects:

p-Toluidine

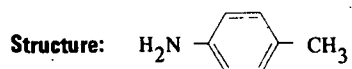
CHEMICAL NAME

CAS Number: 106-49-0

Chemical Name: p-Toluidine

Synonyms: p-Methyl aniline
4-Amino toluene

**Molecular
Formula:** C₇H₉N



Chemical Properties

Molecular Weight: 107.16

Physical State: Solid

Vapor Pressure: 1 mm at 42°C

Vapor Density: 3.90

Boiling Point: 200.55°C at 760 mm

Melting Point: 43.7°C

Density: 0.9619 at 20°C/4°C

Solubility: Slightly (H₂O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—moderate

Disaster hazard—dangerous—toxic fumes

p-Toluidine

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

LD₅₀

Dosage

50 mg/kg

42 mg/kg

LD_{Lo}

100 mg/kg

Animal

mouse

wild bird

mammal

Route

intraperitoneal

oral

oral

Non-lethal Acute Effects:

Difficulty in breathing

Kidney damage

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity: Recognized carcinogen

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Toxaphene

CHEMICAL NAME

CAS Number: 8001-35-2

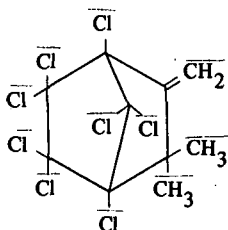
Chemical Name: Toxaphene

Synonyms: Chlorinated camphene
Strobane
Alltox

Geniphenes

Molecular Formula: $C_{10}H_8Cl_8$

Structure:



Chemical Properties

Molecular Weight: 413.84

Physical State: Solid

Vapor Pressure: 0.2 to 0.4 mm at 25°C

Vapor Density:

Boiling Point: Decomposes

Melting Point: 65 to 90°C

Density: 1.66 at 20°C

Solubility: 3 ppm at 25°C (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—dangerous—toxic fumes—chlorides

Toxaphene

PRODUCTION DATA

Annual U.S.
Production: 48×10^6 lbs.

Consumption: 48×10^6 lbs.

Fraction of
Dispersion: 1.0

Fraction of Pro-
duction Lost: 0.01

Release Rate (million lbs/yr): 50.5

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	60 mg/kg	rat	oral
	780 mg/kg	rat	skin
	1025 mg/kg	rabbit	skin
	71 mg/kg	duck	oral
LD _{Lo}	40 mg/kg	human	oral
	2000 mg/m ³ (2 hours)	mouse	inhalation
	180 mg/kg	mouse	interperitoneal
	50 mg/kg	dog	oral
	780 mg/kg	rabbit	oral

Non-lethal Acute Effects:

Nausea and vomiting
Muscle cramps
Irritation of respiratory tract

Chronic Toxicity

U.S. Occupational Standard: 7 ppm for food residues

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: $500 \mu\text{g}/\text{m}^3$

Other Chronic Effects:

Tributyl phosphate

CHEMICAL NAME

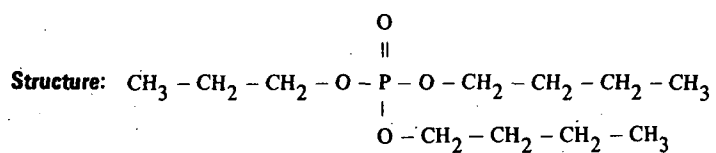
CAS Number: 126-73-8

Chemical Name: Phosphoric acid, tributyl ester

Synonyms: Tributyl phosphate

Molecular

Formula: $C_{12}H_{27}O_4P$



Chemical Properties

Molecular Weight: 266.32

Physical State: Liquid

Vapor Pressure: 20 mm at 20°C

Vapor Density: 9.20

Boiling Point: 289°C

Melting Point:

Density: 0.9727 at 25°C/4°C

Solubility: Soluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—dangerous phosphates

Tributyl phosphate

PRODUCTION DATA

**Annual U.S.
Production:**

Consumption:

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:**

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

LD₅₀

LD_{Lo}

Dosage
3000 mg/kg
63 mg/kg

Animal
rat
mouse

Route
oral
intraperitoneal

Non-lethal Acute Effects:

Stimulation of CNS

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 5 ppm

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 5 ppm

Other Chronic Effects:

Trichloroaniline

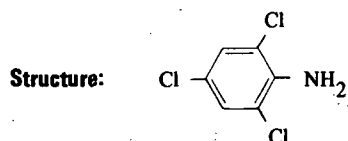
CHEMICAL NAME

CAS Number: 634-93-5

Chemical Name: 2,4,6-Trichloroaniline

Synonyms: Trichloroaniline
sym-Trichloroaniline

Molecular Formula: $C_6H_4Cl_3N$



Chemical Properties

Molecular Weight: 196.46

Physical State: Solid

Vapor Pressure: 1 mm at 134°C

Vapor Density:

Boiling Point: 262°C at 746 mm

Melting Point: 78.5°C

Density:

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Trichloroaniline

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Trichlorobenzene

CHEMICAL NAME

CAS Number: 120-82-1

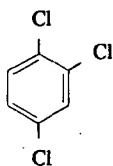
Chemical Name: 1,2,4-Trichlorobenzene

Synonyms:

Molecular

Formula: $C_6H_3Cl_3$

Structure:



Chemical Properties

Molecular Weight: 181.45

Physical State: Liquid

Vapor Pressure: 1 mm at 40°C

Vapor Density: 6.26

Boiling Point: 213.5°C at 760 mm

Melting Point: 16.95°C

Density: 1.4542 at 20°C/4°C

Solubility: Insoluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—slight

Disaster hazard—dangerous toxic fumes—chlorides

Trichlorobenzene

PRODUCTION DATA

Annual U.S. Production: 10×10^6 lbs. (1975 estimate)

Consumption:

Fraction of Dispersion:

Fraction of Production Lost: 0.015

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	756 mg/kg	rat	oral
	766 mg/kg	mouse	oral
LD _{Lo}	500 mg/kg	mouse	intraperitoneal

Non-lethal Acute Effects:

Local irritant
Causes loss of hair

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

1, 1, 1-Trichloroethane

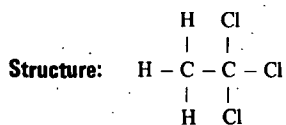
CHEMICAL NAME

CAS Number: 71-55-6

Chemical Name: 1,1,1-Trichloroethane

Synonyms: α -Trichloroethane
Methyl chloroform

**Molecular
Formula:** $C_2H_3Cl_3$



Chemical Properties

Molecular Weight: 133.41

Physical State: Liquid

Vapor Pressure: 130.86 at 25°C

Vapor Density: 4.55

Boiling Point: 74.1°C at 760 mm

Melting Point: -30.41°C

Density: 1.3390 at 20°C/4°C

Solubility: Insoluble (H_2O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—dangerous—chlorides

1, 1, 1-Trichloroethane

PRODUCTION DATA

Annual U.S. Production:	591 x 10 ⁶ lbs. (1974)	Consumption:	591 x 10 ⁶ lbs.
Fraction of Dispersion:	0.73	Fraction of Production Lost:	0.015
Release Rate (million lbs/yr): 284.5			

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	5660 mg/kg	rabbit	oral
	9470 mg/kg	guinea pig	oral
Non-lethal Acute Effects:			
Psychotropic effects:			
TC _{Lo}	350 ppm	human male	inhalation
CNS effects:			
TC _{Lo}	920 ppm	human	inhalation

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 350 ppm

Other Chronic Effects:

Reduced growth

Reversible dystrophic changes in liver, kidneys, myocardium and lungs

Narcotic effect

1, 1, 2-Trichloroethane

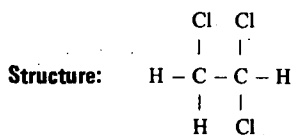
CHEMICAL NAME

CAS Number: 79-00-5

Chemical Name: 1,1,2-Trichloroethane

Synonyms: Vinyl trichloride
 β -Trichloroethane

Molecular
Formula: $C_2H_3Cl_3$



Chemical Properties

Molecular Weight: 133.41

Physical State: Liquid

Vapor Pressure: 25 mm at 25°C

Vapor Density:

Boiling Point: 113.77°C at 760 mm

Melting Point: -36.5°C

Density: 1.4397 at 20°C/4°C

Solubility: Slightly (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—dangerous—toxic fumes—chlorides

1, 1, 2-Trichloroethane

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

LD₅₀

Dosage
580 mg/kg
227 mg/kg

Animal

rat
mouse

Route

oral
subcutaneous

LD_{Lo}

750 mg/kg
95 mg/kg

dog
dog

oral
intravenous

LC_{Lo}

500 mg/kg
500 ppm (8 hours)

rabbit
rat

subcutaneous
inhalation

Non-lethal Acute Effects:

Psychotic effects:

TC_{Lo}

350 ppm

man

inhalation

CNS effects

920 ppm

human

inhalation

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 10 ppm (skin)

Carcinogenicity:

Not carcinogenic according to Dow Chemical Co. after 12-month test

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Trichloroethylene

CHEMICAL NAME

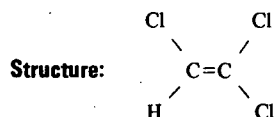
CAS Number: 79-01-6

Chemical Name: Trichloroethylene

Synonyms: Ethylene trichloride
Trichloroethene

Ethynyl trichloride
Acetylene trichloride

Molecular Formula: C_2HCl_3



Chemical Properties

Molecular Weight: 131.39

Physical State: Liquid

Vapor Pressure: 77.5 mm at 25°C

Vapor Density: 4.53

Boiling Point: 87°C at 760 mm

Melting Point: -73°C

Density: 1.4642 at 20°C/4°C

Solubility: Slightly (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Common air contaminant

Slowly oxidized by O_3 and RO_2 ; products are phosgene, HCl, CO, trichloroethylene oxide and dichloroacetylchloride

Unreactive towards OH

Safety Hazard:

Fire—slight

Disaster hazard—dangerous—toxic fumes—chlorides

Trichloroethylene

PRODUCTION DATA

Annual U.S. Production: 285.2 x 10⁶ lbs. (1975) **Consumption:** 370 to 390 x 10⁶ lbs. (1975 estimate)

Fraction of Dispersion: 0.95 **Fraction of Production Lost:** 0.015

Release Rate (million lbs/yr): 429.5

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	4920 mg/kg	rat	oral
	34 mg/kg	mouse	intravenous
	1900 mg/kg	dog	intraperitoneal
LD _{Lo}	857 mg/kg	human	oral
	1800 mg/kg	rabbit	subcutaneous
	5860 mg/kg	dog	oral
	150 mg/kg	dog	intravenous
LC _{Lo}	3000 ppm (2 hours)	mouse	inhalation
	11,000 ppm	rabbit	inhalation
	8000 ppm (8 hours)	rat	inhalation

Non-lethal Acute Effects:

CNS effects			
TC _{Lo}	160 ppm (83 minutes)	human	inhalation
Conjunctivitis			
Irritation of skin and respiratory tract			

Chronic Toxicity

U.S. Occupational Standard: (air)

TWA 100 ppm
Ceiling 200 ppm (recommended 150 ppm)
Peak 300 ppm/5 minutes/2 hours

Carcinogenicity:

TD _{Lo}	351 gm/kg (78 weeks)	mouse	oral
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Mutagenicity:

Teratogenicity:

TLV: 100 ppm

Other Chronic Effects:

Kidney, spleen, and liver damage
Metabolic and enzymatic effects
Hypertension
Decreased ATP level
Reduces antibody formation

Trichlorofluoromethane

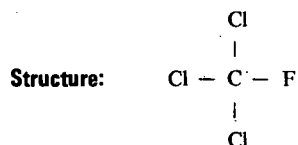
CHEMICAL NAME

CAS Number: 75-69-4

Chemical Name: Trichlorofluoromethane

Synonyms: Freon 11
Monofluorotrichloromethane

**Molecular
Formula:** CCl₃F



Chemical Properties

Molecular Weight: 137.38

Physical State: Liquid

Vapor Pressure: 717.5 mm at 25°C

Vapor Density:

Boiling Point: 24.1°C

Melting Point:

Density: 1.494 at 17.2°C

Solubility: Slightly (H₂O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—toxic fumes—chlorides and fluorides

Trichlorofluoromethane

PRODUCTION DATA

**Annual U.S.
Production:** 299.6 x 10⁶ lbs.

Consumption: 299.6 x 10⁶ lbs.

**Fraction of
Dispersion:** 0.90

**Fraction of Pro-
duction Lost:** 0.015

Release Rate (million lbs/yr): 274.1

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
----------------	--------	--------	-------

Non-lethal Effects:

Narcosis
Anesthesia
Cardiotoxic

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 1000 ppm

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 1000 ppm

Other Chronic Effects:

Trichloroisocyanuric acid

CHEMICAL NAME

CAS Number: 87-90-1

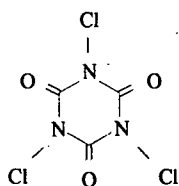
Chemical Name: 1,3,5-Trichloro-s-triazine-2,4,6(1H,3H,5H)-trione

Synonyms: Trichloroisocyanuric acid
Trichlorotriazinetrione

Molecular

Formula: $C_3Cl_3N_3O_3$

Structure:



Chemical Properties

Molecular Weight: 232.5

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point: 225 to 230°C

Density:

Solubility: Soluble (12 gm/l H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—dangerous Cl and CO gases

Trichloroisocyanuric acid

PRODUCTION DATA

Annual U.S.
Production: 40×10^6 lbs.

Consumption: 40×10^6 lbs.

Fraction of
Dispersion: 1.0

Fraction of Pro-
duction Lost: 0.03

Release Rate (million lbs/yr): 41.2

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
750 mg/kg

Animal
rat

Route
oral

Non-lethal Acute Effects:

Irritant to skin and tissue

Chronic Toxicity

U.S. Occupational Standard:

FDA regulation for use as sanitizing agent:
100 ppm Cl⁻ in aqueous solution

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Trichloronaphthalene

CHEMICAL NAME

CAS Number: 2437-54-9

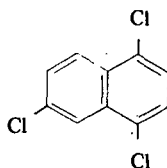
Chemical Name: 1,4,6-Trichloronaphthalene

Synonyms:

Molecular

Formula: $C_{10}H_5Cl_3$

Structure:



Chemical Properties

Molecular Weight: 231.51

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point:

Density:

Solubility:

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—dangerous—chlorides

Trichloronaphthalene

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Non-lethal Acute Effects:

Systemic effects:

TC_{Lo}

30 mg/kg

human

inhalation

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Trichlorophenoxyacetic acid

CHEMICAL NAME

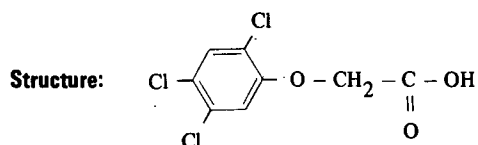
CAS Number: 93-76-5

Chemical Name: (2,4,5-Trichlorophenoxy)acetic acid

Synonyms: 2,4,5-Trichlorophenoxyacetic acid
2,4,5-T

Molecular

Formula: $C_8H_5Cl_3O_3$



Chemical Properties

Molecular Weight: 255.49

Physical State: Solid

Vapor Pressure: Low

Vapor Density:

Boiling Point:

Melting Point: 157 to 158°C

Density: 1.80 at 20°C/20°C

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—dangerous chlorides

Trichlorophenoxyacetic acid

PRODUCTION DATA

Annual U.S.
Production: 6.0×10^6 lbs.

Consumption:

Fraction of
Dispersion: Estimated as 1

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 6.0

TOXICITY DATA

Acute Toxicity LD ₅₀	Dosage	Animal	Route
	500 mg/kg	male rat	oral
	300 mg/kg	rat	oral
	500 mg/kg	rat	unreported
	389 mg/kg	mouse	oral
	100 mg/kg	dog	oral
	381 mg/kg	guinea pig	oral
	310 mg/kg	chicken	oral
	500 mg/kg	mammal	oral

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 10 mg/m^3

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TD_{Lo}

100 mg/kg

rat (6-15 days—pregnant)

oral

<150 $\mu\text{g/kg}$

mouse (6-14 days—pregnant)

subcutaneous

(The teratogenicity is due in part to 2,3,7,8-TCDD (2,3,7,8-tetrachlorodibenzo-p-dioxin) which is present as a contaminant)

Other Chronic Effects:

TLV:

Trichloropropane

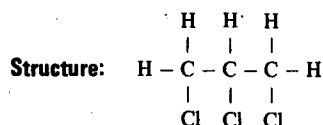
CHEMICAL NAME

CAS Number: 96-18-4

Chemical Name: 1,2,3-Trichloropropane

Synonyms: Glycerol trichlorohydrin
Allyl trichloride trichlorohydrin

**Molecular
Formula:** $C_3H_5Cl_3$



Chemical Properties

Molecular Weight: 147.43

Physical State: Liquid

Vapor Pressure: 3.59 mm at 25°C

Vapor Density: 5.0

Boiling Point: 156.85°C at 760 mm

Melting Point: -14.7°C

Density: 1.3889 at 20°C/4°C

Solubility: Slightly (H_2O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—moderate

Disaster hazard—dangerous—toxic fumes—chlorides

Trichloropropane

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	320 mg/kg	rat	oral
	1770 mg/kg	rabbit	skin
LD _{Lo}	200 mg/kg	dog	oral
LC _{Lo}	1000 ppm (4 hours)	rat	inhalation

Non-lethal Acute Effects:

Local irritant
Lesions in liver, kidney and heart

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 50 ppm

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 50 ppm

Other Chronic Effects:

Trichlorotrifluoroethane

CHEMICAL NAME

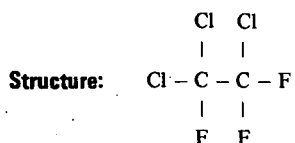
CAS Number: 76-13-1

Chemical Name: 1,1,2-Trichloro-1,2,2-trifluoroethane

Synonyms: Trifluorotrichloroethane

Molecular

Formula: $C_2Cl_3F_3$



Chemical Properties

Molecular Weight: 187.38

Physical State: Liquid

Vapor Pressure: 337.72 mm at 25°C

Vapor Density: 6.47

Boiling Point: 47.7°C at 760 mm

Melting Point: -36.4°C

Density: 1.5635 at 25°C/4°C

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Stable in lower atmosphere

Safety Hazard:

Fire—slight

Disaster hazard—dangerous—toxic fumes—fluorides and chlorides

Trichlorotrifluoroethane

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr): 682 (1973 emissions of F-11 and F-12)

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

TC_{Lo}

4500 ppm

human

inhalation

Mutagenicity:

Teratogenicity:

TLV: 1000 ppm

Other Chronic Effects:

Tricresyl phosphate

CHEMICAL NAME

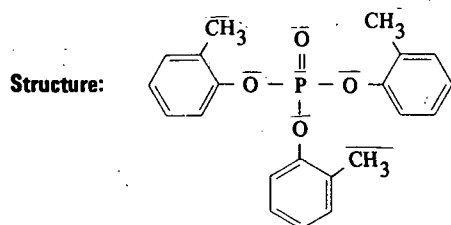
CAS Number: 78-30-8

Chemical Name: Phosphoric acid, tri-o-tolyl ester

Synonyms: o-Tolyl phosphate
Tricresyl phosphate

Tri-o-cresyl phosphate
Tri-o-tolyl phosphate
Tri-2-tolyl phosphate

Molecular Formula: $C_{21}H_{21}O_4P$



Chemical Properties

Molecular Weight: 368.37

Physical State: Liquid

Vapor Pressure: 0.29 mm at 200°C

Vapor Density: 12.7

Boiling Point: 410°C

Melting Point: 11°C

Density: 1.1955 at 20°C/4°C

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—slight

Disaster hazard—dangerous PO_x

Tricresyl phosphate

PRODUCTION DATA

Annual U.S.
Production: 50.2 x 10⁶ lbs. Consumption: 42.7 x 10⁶ lbs.

Fraction of
Dispersion: 1.0 Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 43.5

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD _{Lo}	4680 mg/kg	rat	oral
	500 mg/kg	dog	oral
	100 mg/kg	rabbit	oral

Non-lethal Acute Effects:
CNS effects, paralysis
Nausea and vomiting

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 0.1 mg/m³

Carcinogenicity: Negative result in 12-week rat study

Mutagenicity:

Teratogenicity:

TLV: 0.1 mg/m³

Other Chronic Effects:

Tridecylbenzenesulfonic acid, sodium salt

CHEMICAL NAME

CAS Number: 14356-40-2

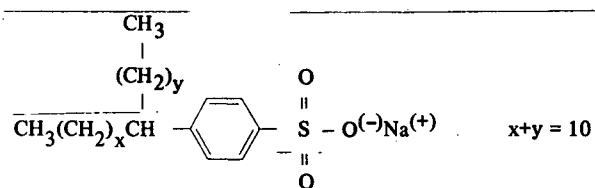
Chemical Name: p-Tridecylbenzenesulfonic acid, sodium salt

Synonyms:

Molecular

Formula: $C_{19}H_{32}O_3S \cdot Na$

Structure:



Chemical Properties

Molecular Weight: 361.50

Physical State:

Vapor Pressure: Negligible at 25°C

Vapor Density:

Boiling Point:

Melting Point:

Density:

Solubility:

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Tridecylbenzenesulfonic acid, sodium salt

PRODUCTION DATA

Annual U.S.
Production: 149.9×10^6 lbs.

Consumption: 149.9×10^6 lbs.

Fraction of
Dispersion: 1.0

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 152.1

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Triethanolamine

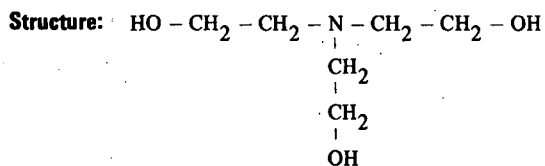
CHEMICAL NAME

CAS Number: 102-71-6

Chemical Name: 2,2',2'',-Nitrilotriethanol

Synonyms: Triethanolamine
2,2',2''-Trihydroxyethylamine

**Molecular
Formula:** $C_6H_{15}NO_3$



Chemical Properties

Molecular Weight: 149.19

Physical State: Solid-liquid

Vapor Pressure: <0.01 mm at 20°C

Vapor Density: 5.14

Boiling Point: 277°C at 150 mm

Melting Point: 21.2°C

Density: 1.1242 at 20°C/4°C

Solubility: Infinite (H₂O)

**Octanol/Water Parti-
tion Coefficient:** -1.75

Environmental Persistence

BOD: 66% of theoretical after 10 days at 20°C at 10 mg/l
Total theoretical oxygen demand = 2.04 gm/gm
Resistance to biodegradation

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire-slight

Disaster hazard-dangerous-NO_x

Triethanolamine

PRODUCTION DATA

Annual U.S. Production:	100.7 x 10 ⁶ lbs.	Consumption:	85.7 x 10 ⁶ lbs.
Fraction of Dispersion:	0.40	Fraction of Production Lost:	0.015
Release Rate (million lbs/yr):	35.8		

TOXICITY DATA

Acute Toxicity LD ₅₀	Dosage 8000 mg/kg	Animal guinea pig	Route oral
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Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Triethylamine

CHEMICAL NAME

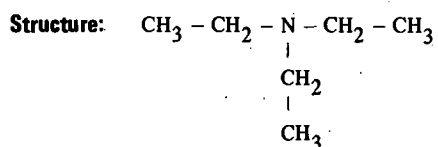
CAS Number: 121-44-8

Chemical Name: Triethylamine

Synonyms: N,N-Diethylethanamine

Molecular

Formula: $C_6H_{15}N$



Chemical Properties

Molecular Weight: 101.19

Physical State: Liquid

Vapor Pressure:

Vapor Density: 3.48

Boiling Point: 89.3°C at 760 mm

Melting Point: -114.7°C

Density: 0.7275 at 20°C/4°C

Solubility: Soluble (H₂O)

Octanol/Water Partition Coefficient: 1.37

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—dangerous

Triethylamine

PRODUCTION DATA

Annual U.S.
Production: 22.8 x 10⁶ lbs. (1967)
(Includes monoethylamine)

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	460 mg/kg	rat	oral
	546 mg/kg	mouse	oral
	570 mg/kg	rabbit	skin
LC _{Lo}	1000 ppm (4 hours)	rat	inhalation
	1000 ppm (4 hours)	guinea pig	inhalation

Non-lethal Acute Effects:

Liver and kidney damage
Irritant to skin and mucous membranes

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 25 ppm

Other Chronic Effects:

Triethylene glycol

CHEMICAL NAME

CAS Number: 112-27-6

Chemical Name: Triethylene glycol

Synonyms: 2,2'-Ethylene dioxy diethanol glycol
Bis (hydroxyethyl) ether

**Molecular
Formula:** $C_6H_{14}O_4$

Structure:

$$\begin{array}{c} \text{CH}_2 - \text{O} - \text{CH}_2 - \text{CH}_2 - \text{OH} \\ | \\ \text{CH}_2 - \text{O} - \text{CH}_2 - \text{CH}_2 - \text{OH} \end{array}$$

Chemical Properties

Molecular Weight: 150.18

Physical State: Liquid

Vapor Pressure: 1 mm at 114°C

Vapor Density:

Boiling Point: 278.3°C at 760 mm

Melting Point: -5°C

Density: 1.1274 at 15°C/4°C

Solubility: Infinite (H_2O)

**Octanol/Water Parti-
tion Coefficient:** -2.08

Environmental Persistence

BOD: 85% of theoretical after 20 days at 20°C
Total theoretical oxygen demand = 1.6 gm/gm

Atmospheric Reactivity:

Safety Hazard:

Fire—slight
Explosion—moderate

Triethylene glycol

PRODUCTION DATA

Annual U.S. Production:	113 x 10 ⁶ lbs.	Consumption:	113 x 10 ⁶ lbs.
Fraction of Dispersion:	0.75	Fraction of Production Lost:	0.015
Release Rate (million lbs/yr):	70.8		

TOXICITY DATA

Acute Toxicity LD ₅₀	Dosage 9739 mg/kg	Animal mouse	Route subcutaneous
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Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Triethylene glycol, dimethyl ether

CHEMICAL NAME

CAS Number: 112-49-2

Chemical Name: 2,5,8,11-Tetraoxadodecane

Synonyms: Triethyleneglycol dimethyl ether
Triglyme
1,2-Bis(2-methoxyethoxy)ethane

Molecular
Formula: $C_8H_{18}O_4$

Structure: $CH_3 - (OCH_2CH_2)_3 - OCH_3$

Chemical Properties

Molecular Weight: 178.22

Physical State: Liquid

Vapor Pressure: 0.9 mm at 20°C

Vapor Density:

Boiling Point: 216°C

Melting Point: -46°C

Density: 0.9862 at 20°C/20°C

Solubility: Soluble (H₂O)

Octanol/Water Parti-
tion Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—slight

Triethylene glycol, dimethyl ether

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
(Low toxicity)

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Triethylene glycol, monomethyl ether

CHEMICAL NAME

CAS Number: 112-35-6

Chemical Name: 2-[2-(2-Methoxyethoxy)ethoxy]ethanol

Synonyms: Triethylene glycol, monomethyl ether
Methoxytriglycol
Methoxytriethylene glycol

Molecular Formula: $C_7H_{16}O_4$

Structure: $CH_3 - (OCH_2CH_2)_3 - OH$

Chemical Properties

Molecular Weight: 164.20

Vapor Pressure: <0.01 mm at 20°C

Boiling Point: 249°C

Density: 1.0494

Octanol/Water Partition Coefficient:

Physical State:

Vapor Density:

Melting Point:

Solubility: Infinite (H_2O)

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Fire—slight

Triethylene glycol, monomethyl ether

PRODUCTION DATA

**Annual U.S.
Production:** 31.7×10^6 lbs.

Consumption: 26.7×10^6 lbs.

**Fraction of
Dispersion:** 1.0

**Fraction of Pro-
duction Lost:** 0.015

Release Rate (million lbs/yr): 27.2

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Trifluralin

CHEMICAL NAME

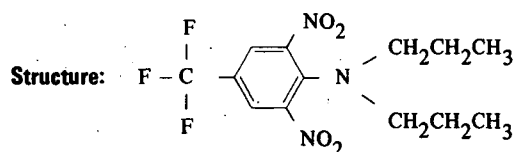
CAS Number: 1582-09-8

Chemical Name: α,α,α -Trifluoro-2, 6-dinitro-N, N-dipropyl-p-toluidine

Synonyms: Trifluralin

Molecular

Formula: $C_{13}H_{16}F_3N_3O_4$



Chemical Properties

Molecular Weight: 335.32

Physical State: Solid

Vapor Pressure: 1.99×10^{-4} mm at 29.5°C

Vapor Density:

Boiling Point: 139 to 140°C at 4.2 mm

Melting Point: 48.5 to 49°C

Density:

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Degraded by ultraviolet irradiation

Safety Hazard:

Disaster hazard—dangerous nitrates and fluorides

Trifluralin

PRODUCTION DATA

**Annual U.S.
Production:** 20×10^6 lbs.

Consumption: 20×10^6 lbs.

**Fraction of
Dispersion:** 1.0

**Fraction of Pro-
duction Lost:** 0.01

Release Rate (million lbs/yr): 20.2

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	>10,000 mg/kg	rat	oral
	5 gm/kg	mouse	oral
	5000 gm/kg	mouse	oral
	500 mg/kg	rat	oral

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Triisobutylene

CHEMICAL NAME

CAS Number: 9003-27-4

Chemical Name: 2-Methyl-1-propene, homopolymer

Synonyms: Triisobutylene Polyisobutylene
2-Methylpropene (trimer)
Poly(2-methylpropene)

**Molecular
Formula:** $C_{12}H_{24}$

Structure: (mixture of isomers)

Chemical Properties

Molecular Weight: 168.33

Physical State: Liquid

Vapor Pressure: 2.08 mm at 25°C

Vapor Density:

Boiling Point: 179 to 181°C

Melting Point: -76°C

Density: 0.7590 at 20°C/4°C

Solubility: Insoluble (H₂O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Triisobutylene

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Trimethylamine

CHEMICAL NAME

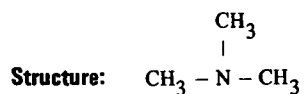
CAS Number: 75-50-3

Chemical Name: Trimethylamine

Synonyms: N,N-Dimethylmethanamine

Molecular

Formula: C_3H_9N



Chemical Properties

Molecular Weight: 59.11

Physical State: Gas

Vapor Pressure: 687 mm at 0°C

Vapor Density: 2.0

Boiling Point: 2.87°C at 760 mm

Melting Point: -117.2°C

Density: 0.6356 at 20°C/4°C

Solubility: Very (H₂O)

Octanol/Water Partition Coefficient: 1.45

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—moderate

Explosion—moderate

Disaster hazard—moderate—toxic fumes

Trimethylamine

PRODUCTION DATA

Annual U.S.
Production: 28.8×10^6 lbs.

Consumption: 28.8×10^6 lbs.

Fraction of
Dispersion: 0.70

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 20.6

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	90 mg/kg	mouse	intravenous
LD _{Lo}	75 mg/kg	mouse	intraperitoneal
	1000 mg/kg	mouse	subcutaneous
	800 mg/kg	rabbit	subcutaneous
	400 mg/kg	rabbit	intravenous
	2000 mg/kg	frog	subcutaneous

Non-lethal Acute Effects:
Irritant to skin, respiratory organs

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Trimethylpentanediol

CHEMICAL NAME

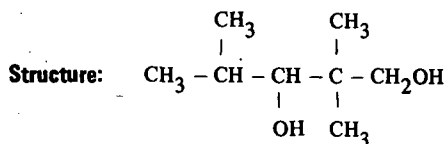
CAS Number: 144-19-4

Chemical Name: 2,2,4-Trimethyl-1,3-pentanediol

Synonyms: TMPD

Molecular

Formula: $C_8H_{18}O_2$



Chemical Properties

Molecular Weight: 146.23

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: 234°C at 737 mm

Melting Point: 51.8 to 52.2°C

Density: 0.937 at 15°C/15°C

Solubility: Slightly (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—slight

Trimethylpentanediol

PRODUCTION DATA

Annual U.S.
Production: 20×10^6 lbs.

Consumption: 20×10^6 lbs.

Fraction of
Dispersion: 0.8

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 16.3

TOXICITY DATA

Acute Toxicity

Dosage

Animal

Route

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Trinitrotoluene

CHEMICAL NAME

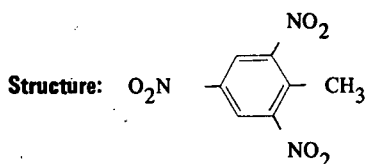
CAS Number: 118-96-7

Chemical Name: 2,4,6-Trinitrotoluene

Synonyms: Trinitrotoluene
TNT
sym-Trinitrotoluene

Triton
s-Trinitrotoluene

Molecular Formula: $C_7H_5N_3O_6$



Chemical Properties

Molecular Weight: 227.13

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: 290 to 310°C (explodes)

Melting Point: 104°C

Density: 1.654

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Explosion—moderate

Disaster hazard—highly dangerous—toxic fumes

Trinitrotoluene

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
TD_{Lo}

Dosage
700 mg/kg
1850 mg/kg
200 mg/kg
500 mg/kg
500 mg/kg

Animal
rat
cat
cat
rabbit
rabbit

Route
oral
oral
subcutaneous
oral
subcutaneous

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Trithion

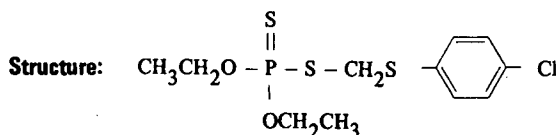
CHEMICAL NAME

CAS Number: 786-19-6

Chemical Name: Phosphorodithioic acid, S-[[p-Chlorophenylthio]methyl]O, O-diethyl ester

Synonyms: Trithion
O,O-diethyl-S-p-chlorophenylthiomethyl phosphorodithioate
Carbophenothion

Molecular Formula: $C_{11}H_{16}ClO_2PS_3$



Chemical Properties

Molecular Weight: 260.39

Physical State:

Vapor Pressure: Negligible

Vapor Density:

Boiling Point: 82° at 0.01 mm

Melting Point:

Density: 1.280 to 1.285 at 20°C/20°C

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Disaster hazard—dangerous phosphates and chlorides

Trithion

PRODUCTION DATA

Annual U.S.
Production: 2.0×10^6 lbs.

Consumption:

Fraction of
Dispersion: Estimated as 1.0

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 2.0

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	32 mg/kg	male rat	oral
	10 mg/kg	rat	oral
	27 mg/kg	rat	skin
	11 mg/kg	rat	intraperitoneal
	218 mg/kg	mouse	oral
	27 mg/kg	mouse	intraperitoneal
	1270 mg/kg	rabbit	skin
	57 mg/kg	chicken	oral
	6 mg/kg	wild bird	oral

Non-lethal Acute Effects:
Pulmonary edema
Convulsions

Chronic Toxicity

U.S. Occupational Standard: EPA farm worker reentry standard

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Urea

CHEMICAL NAME

CAS Number: 57-13-6

Chemical Name: Urea

Synonyms: Carbamide
Carbonyldiamine

**Molecular
Formula:** CH₄N₂O

Structure:
$$\begin{array}{c} \text{O} \\ || \\ \text{H}_2\text{N} - \text{C} - \text{NH}_2 \end{array}$$

Chemical Properties

Molecular Weight: 60.06

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: (Decomposes)

Melting Point: 135°C

Density: 1.3230 at 20°C/4°C

Solubility: Very soluble (H₂O)

**Octanol/Water Parti-
tion Coefficient:** -2.96

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Urea

PRODUCTION DATA

**Annual U.S.
Production:** $8,390 \times 10^6$ lbs. (1975)

Consumption: $8,420 \times 10^6$ lbs. (1975)

**Fraction of
Dispersion:**

**Fraction of Pro-
duction Lost:** 0.15

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity
 LD_{Lo}

Dosage
3000 mg/kg
3000 mg/kg
3000 mg/kg
600 mg/kg
511 mg/kg

Animal
dog
dog
rabbit
frog
domestic

Route
subcutaneous
intravenous
subcutaneous
subcutaneous
oral

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Vernam

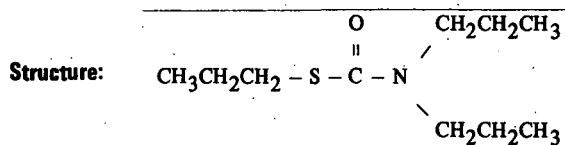
CHEMICAL NAME

CAS Number: 1929-77-7

Chemical Name: Dipropylcarbamothioic acid, S-propyl ester

Synonyms: S-Propyldipropylthiocarbamate

**Molecular
Formula:** C₁₀H₂₁NOS



Chemical Properties

Molecular Weight: 203.38

Physical State: Liquid

Vapor Pressure: 10.4×10^{-3} mm at 25°C

Vapor Density:

Boiling Point: 150°C at 30 mm

Melting Point:

Density: 0.95 at 20°C/20°C

Solubility: 90 ppm H₂O at 20°C

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

PRODUCTION DATA

Annual U.S. Production:	2.0 x 10 ⁶ lbs.	Consumption:	
Fraction of Dispersion:	Estimated as 1.0	Fraction of Production Lost:	
Release Rate (million lbs/yr):	2.0		

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	1800 mg/kg	rat	oral
	1470 mg/kg	rat	oral
	1780 mg/kg	rat	unreported

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Vinyl acetate

CHEMICAL NAME

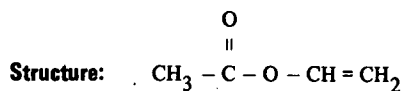
CAS Number: 108-05-4

Chemical Name: Vinyl acetate

Synonyms: Acetic acid, vinyl ester
Acetic acid, ethenyl ester

Molecular

Formula: C₄H₆O₂



Chemical Properties

Molecular Weight: 86.09

Physical State: Liquid (polymerizes)

Vapor Pressure: 107.5 mm at 25°C

Vapor Density: 3.0

Boiling Point: 72.2 to 72.3°C at 760 mm

Melting Point: -93.2°C

Density: 0.9317 at 20°C/4°C

Solubility: Insoluble (H₂O)
Soluble in hot H₂O

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD: 72% of theoretical after 20 days at 20°C

Total theoretical oxygen demand = 1.67 gm/gm

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—highly dangerous

Vinyl acetate

PRODUCTION DATA

Annual U.S. Production:	1210.7 x 10 ⁶ lbs.	Consumption:	989.4 x 10 ⁶ lbs.
Fraction of Dispersion:	0	Fraction of Production Lost:	0.015
Release Rate (million lbs/yr):	18.2		

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	2920 mg/kg	rat	oral
	2320 mg/kg	rabbit	skin
LD _{Lo}	500 mg/kg	rat	intraperitoneal
LC _{Lo}	4000 ppm (4 hours)	rat	inhalation

Non-lethal Acute Effects:
Skin irritant
Vapors may be narcotic

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 10 ppm

Carcinogenicity:

Mutagenicity:

Teratogenicity:

Other Chronic Effects:

TLV: TWA 10 ppm

Odor perception: 0.12 ppm

Vinyl chloride

CHEMICAL NAME

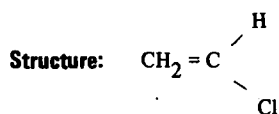
CAS Number: 75-01-4

Chemical Name: Chloroethylene

Synonyms: Vinyl chloride
Chloroethene

Molecular

Formula: C_2H_3Cl



Chemical Properties

Molecular Weight: 62.50

Physical State: Liquid or gas

Vapor Pressure: 2660 mm at 25°C

Vapor Density: 2.15

Boiling Point: -13.4°C at 760 mm

Melting Point: -153.8°C

Density: 0.9195 at 15°C/4°C

Solubility: Slightly (1.1 gm/1 H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD: Total theoretical oxygen demand = 1.28 gm/gm

Atmospheric Reactivity: Reacts with oxidizing materials

Activity toward O₃: $t_{1/2}$ = <3 days

RO₂: $t_{1/2}$ = 10³ days; slow oxidation in water

OH: $t_{1/2}$ = 3 days

Safety Hazard:

Fire—dangerous

Explosion—severe

Disaster hazard—very dangerous—toxic fumes

Vinyl chloride

PRODUCTION DATA

Annual U.S. Production: 5088.5×10^6 lbs.
($4,174.6 \times 10^6$ lbs., 1975)

Consumption: 4467.6×10^6 lbs.

Fraction of Dispersion: 0.01

Fraction of Production Lost: 0.02

Release Rate (million lbs/yr): 146.5

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LC	100,000 to 400,000 ppm	mouse	unknown
		dog	unknown
		cat	unknown
		guinea pig	unknown

Non-lethal Acute Effects:

Cardiovascular			
TC _{Lo}	20 ppm	human	inhalation
Paralysis			
TC _{Lo}	300 ppm	human	inhalation
Skin irritation			
Conjunctivitis			

Chronic Toxicity

U.S. Occupational Standard: (air) TWA 1 ppm
Ceiling 5 ppm

Carcinogenicity:

LC _{Lo}	250 ppm (4 hours/ 260 days)	rat	inhalation
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Mutagenicity:

Positive: Ames *Salmonella*

Teratogenicity:

TLV: 500 ppm or 1300 mg/m³

Other Chronic Effects:

Liver and kidney damage
Cardiovascular damage
Thyroid and brain degeneration

Vinylidene chloride

CHEMICAL NAME

CAS Number: 75-35-4

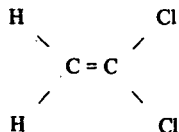
Chemical Name: 1,1-Dichloroethylene

Synonyms: Vinylidene chloride

Molecular

Formula: $C_2H_2Cl_2$

Structure:



Chemical Properties

Molecular Weight: 97.0

Physical State: Volatile liquid

Vapor Pressure: 617.14 mm at 25°C

Vapor Density:

Boiling Point: 37°C at 760 mm

Melting Point: -122.53°C

Density: 1.213 at 20°C/4°C

Solubility: Insoluble (H_2O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing materials

Activity towards O_3 : $t_{1/2} < 1$ day

RO_2 : $t_{1/2} = 10^3$ days

OH: $t_{1/2} < 1$ day, producing phosgene and formaldehyde

Safety Hazard:

Fire—dangerous

Explosion—moderate

Disaster hazard—highly dangerous—toxic fumes—chlorides

Vinylidene chloride

PRODUCTION DATA

**Annual U.S.
Production:** 260×10^6 lbs.

Consumption: 54×10^6 lbs.

**Fraction of
Dispersion:** 0

**Fraction of Pro-
duction Lost:** 0.03

Release Rate (million lbs/yr): 2.4

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	3700 mg/kg	rabbit	subcutaneous
	5750 mg/kg	dog	oral
	225 mg/kg	dog	intravenous
LC ₅₀	10,000 ppm	rat	inhalation

Non-lethal Acute Effects:

Irritant to eyes, skin, and respiratory tract
Narcosis

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity: Suspected

Mutagenicity: Positive: Ames bacterial system

Teratogenicity:

TLV: 25 ppm (suggested)

Odor perception: 1000 ppm

Other Chronic Effects:

Vinyltoluene

CHEMICAL NAME

CAS Number: 622-97-9

Chemical Name: p-Methylstyrene

Synonyms: Vinyltoluene

Molecular

Formula: C₉H₁₀

Structure: CH₂=CH  CH₃

Chemical Properties

Molecular Weight: 118.2

Physical State: Liquid

Vapor Pressure: 1.15 mm at 20°C

Vapor Density: 4.08

Boiling Point: 170 to 171°C

Melting Point:

Density: Monomer: 0.89 at 25°C/25°C
Polymer: 1.027 at 25°C/25°C

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity: Reacts with oxidizing material forming formaldehyde and methylbenzaldehyde

Activity toward RO₂: t_{1/2} = 24 hours

O₃: t_{1/2} = 24 hours

OH: t_{1/2} = 1 day

Safety Hazard:

Fire—moderate

Vinyltoluene

PRODUCTION DATA

Annual U.S.
Production: 40×10^6 lbs.

Consumption: 40×10^6 lbs.

Fraction of
Dispersion: 0.30

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 12.6

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
4000 mg/kg

Animal
rat

Route
oral

Non-lethal Acute Effects:

Irritation

TCLo

400 ppm

human

inhalation

Damaged kidneys and liver

Irritant to eye, nose and throat

Chronic Toxicity

U.S. Occupational Standard: (air) Ceiling 100 ppm

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 1000 ppm

Other Chronic Effects:

Warfarin

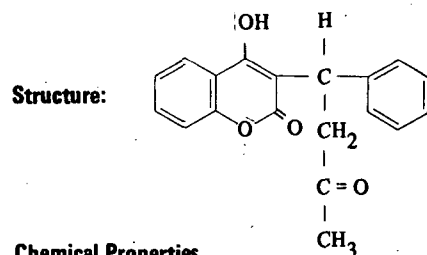
CHEMICAL NAME

CAS Number: 81-81-2

Chemical Name: 3-(α -Acetonylbenzyl)-4-hydroxycoumarin)

Synonyms: Warfarin
WARF-42
Compound 42

Molecular Formula: C₁₉H₁₆O₄



Chemical Properties

Molecular Weight: 308.35

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point: 161°C

Density:

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Warfarin

PRODUCTION DATA

Annual U.S.
Production: 12.0×10^6 lbs.

Consumption:

Fraction of
Dispersion: Estimated as 1.0

Fraction of Pro-
duction Lost: 0.015

Release Rate (million lbs/yr): 13.0

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	58 to 323 mg/kg	rat	oral
	3 mg/kg	rat	oral
	186 mg/kg	rat	intravenous
	165 mg/kg	mouse	intravenous
	200 mg/kg	dog	oral
	200 mg/kg	dog	intravenous
	800 mg/kg	rabbit	oral
	100 mg/kg	rabbit	intravenous
	182 mg/kg	guinea pig	oral
LD _{Lo}	420 mg/kg	rat	intrapertioneal

Non-lethal Acute Effects:

Inhibition of prothromben formation
Capillary damage

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV: 0.1 mg/m^3

Other Chronic Effects:

m-Xylene

CHEMICAL NAME

CAS Number: 108-38-3

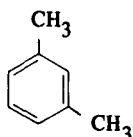
Chemical Name: m-Xylene

Synonyms: m-Xylol

Molecular

Formula: C_8H_{10}

Structure:



Chemical Properties

Molecular Weight: 106.2

Physical State: Liquid

Vapor Pressure: 8.56 mm at 25°C

Vapor Density: 3.66

Boiling Point: 139°C at 760 mm

Melting Point: -47.4°C

Density: 0.864 at 20°C/4°C

Solubility: Insoluble (0.13 gm/l H₂O)

Octanol/Water Partition Coefficient: 3.20

Environmental Persistence

BOD: Total theoretical oxygen demand = 3.17 gm/gm

Atmospheric Reactivity: Reacts with oxidizing materials

Activity toward O₃: $t_{1/2}$ = 100 years

RO₂: $t_{1/2}$ = 2200 years

OH: $t_{1/2}$ = 3 days

Common air contaminant, reported at 0.016 to 0.61 ppm

Safety Hazard:

Fire—dangerous

Explosion—moderate

m-Xylene

PRODUCTION DATA

Annual U.S. Production: ca. 1710×10^6 lbs. (1975)
(4907.1×10^6 lbs.-mixed xylenes, 1975)

Consumption: ca. 1710×10^6 lbs.
(4907×10^6 lbs.-mixed xylenes)

Fraction of Dispersion: (0.13-mixed xylenes)

Fraction of Production Lost: 0.01

Release Rate (million lbs/yr): (ca. 765-mixed xylenes)

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	5000 mg/kg	rat	oral
LD _{Lo}	2000 mg/kg	rat	intraperitoneal
	5000 mg/kg	rat	subcutaneous
LC _{Lo}	8000 ppm (4 hours)	rat	inhalation

Chronic Toxicity

U.S. Occupational Standard: NIOSH recommended TWA 100 ppm

Carcinogenicity: Neoplastic effects in mice after dermal application

Mutagenicity:

Teratogenicity: TLV: 100 ppm

Other Chronic Effects:

- Anorexia
- CNS disturbances
- Hyperglycemia
- Leucopenia
- Leucocytosis
- Epidermal hypertrophy.

o-Xylene

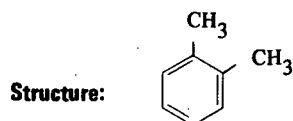
CHEMICAL NAME

CAS Number: 95-47-6

Chemical Name: o-Xylene

Synonyms: o-Xylol

**Molecular
Formula:** C₈H₁₀



Chemical Properties

Molecular Weight: 106.2

Physical State: Liquid

Vapor Pressure: 10 mm at 32.1°C

Vapor Density:

Boiling Point: 144.4°C at 760 mm

Melting Point: -25°C

Density: 0.880 at 20°C/4°C

Solubility: Insoluble (H₂O)

**Octanol/Water Parti-
tion Coefficient:** 2.77

Environmental Persistence

BOD: Total theoretical oxygen demand = 3.17 gm/gm

Atmospheric Reactivity: Reacts with oxidizing materials

Safety Hazard:

Fire—moderate

Explosion—slight

o-Xylene

PRODUCTION DATA

Annual U.S. Production: 679.7 x 10⁶ lbs. (1975) **Consumption:** 679.7 x 10⁶ lbs.

Fraction of Dispersion: (0.13-mixed xylenes) **Fraction of Production Lost:** 0.01

Release Rate (million lbs/yr): (ca. 765-mixed xylenes)

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD _{Lo}	5000 mg/kg	rat	oral
	1500 mg/kg	rat	intraperitoneal
	2500 mg/kg	mouse	subcutaneous
LC _{Lo}	6920 ppm	mouse	inhalation

Chronic Toxicity

U.S. Occupational Standard: NIOSH recommended: (air) TWA 100 ppm

Carcinogenicity: Neoplastic effects in mice after dermal applications

Mutagenicity:

Teratogenicity: TLV: 100 ppm

Other Chronic Effects:

Leucopenia and leucocytosis
CNS disturbances
Anorexia
Hyperglycemia
Epidermal hypertrophy

p-Xylene

CHEMICAL NAME

CAS Number: 106-42-3

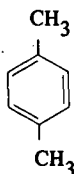
Chemical Name: p-Xylene

Synonyms: p-Xylol

Molecular

Formula: C₈H₁₀

Structure:



Chemical Properties

Molecular Weight: 106.2

Physical State: Liquid

Vapor Pressure: 10 mm at 27.3°C

Vapor Density: 3.66

Boiling Point: 138.5°C at 760 mm

Melting Point: 13.2°C

Density: 0.8611 at 20°C/4°C

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient: 3.15

Environmental Persistence

BOD: Total theoretical oxygen demand = 3.179 gm/gm

Atmospheric Reactivity: Reacts with oxidizing materials

Activity toward RO₂: t_{1/2} = 2200 years

O₃: t_{1/2} = 100 years

OH: t_{1/2} = 3 days

Safety Hazard:

Fire—moderate

Explosion—moderate

p-Xylene

PRODUCTION DATA

Annual U.S. Production: 2419.3×10^6 lbs. (1975) **Consumption:** 2419.3×10^6 lbs.

Fraction of Dispersion: 0.01 **Fraction of Production Lost:** 0.01

Release Rate (million lbs/yr): 39.9

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
LD ₅₀	5000 mg/kg	rat	oral
LD _{Lo}	2000 mg/kg	rat	intraperitoneal
	5000 mg/kg	rat	subcutaneous
LC _{Lo}	3460 ppm	mouse	inhalation

Chronic Toxicity

U.S. Occupational Standard: NIOSH recommended: TWA 100 ppm

Carcinogenicity:

Mutagenicity:

Teratogenicity: TLV: 100 ppm

Other Chronic Effects:

Leucopenia and leucocytosis
CNS disturbances
Anorexia
Hyperglycemia
Epidermal hypertrophy

Xylenesulfonic acid, sodium salt

CHEMICAL NAME

CAS Number: 827-93-0

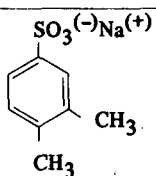
Chemical Name: 3,4-Xylenesulfonic acid, sodium salt

Synonyms: Sodium xylene sulfonate

Molecular

Formula: $C_8H_{10}O_3S \cdot Na$

Structure:



Chemical Properties

Molecular Weight: 209.23

Physical State:

Vapor Pressure: Negligible at 25°C

Vapor Density:

Boiling Point:

Melting Point:

Density:

Solubility:

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Xylenesulfonic acid, sodium salt

PRODUCTION DATA

**Annual U.S.
Production:** 37.4×10^6 lbs.

Consumption: 37.4×10^6 lbs.

**Fraction of
Dispersion:** 1.0

**Fraction of Pro-
duction Lost:** 0.3

Release Rate (million lbs/yr): 38.5

TOXICITY DATA

Acute Toxicity
LD₅₀

Dosage
500 mg/kg

Animal
mouse

Route
intraperitoneal

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

2, 6-Xylenol

CHEMICAL NAME

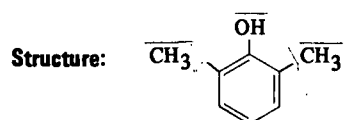
CAS Number: 576-26-1

Chemical Name: 2,6-Dimethylphenol

Synonyms: Xylenol

Molecular

Formula: $C_8H_{10}O$



Chemical Properties

Molecular Weight: 122.18

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point: 212°C at 760 mm

Melting Point: 49°C

Density: 0.984 at 60°C/15.5°C

Solubility: Soluble (H_2O)

Octanol/Water Partition Coefficient: 2.33

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

2, 6-Xylenol

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity LD ₅₀	Dosage	Animal	Route
	296 mg/kg	rat	oral
	980 mg/kg	mouse	oral
	920 mg/kg	mouse	skin
	150 mg/kg	mouse	intraperitoneal
	700 mg/kg	rabbit	oral

Chronic Toxicity

U.S. Occupational Standard: (air) TWA: 100 ppm

Carcinogenicity:

Neoplastic effects:

TD_{Lo} 4000 mg/kg (120 weeks) mouse skin

Mutagenicity:

Teratogenicity:

TLV:

Odor perception: 200 ppm

Other Chronic Effects:

3, 5-Xylenol

CHEMICAL NAME

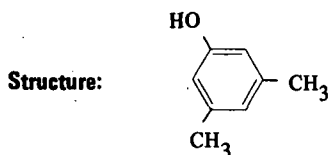
CAS Number: 1300-71-6

Chemical Name: Dimethylphenol

Synonyms: Xylenol
3,5-Xylenol
5-Hydroxy-1, 3-dimethylbenzene

3,5-Dimethylphenol
1-Hydroxy-3, 5-dimethylbenzene

**Molecular
Formula:** $C_8H_{10}O$



Chemical Properties

Molecular Weight: 122.17

Physical State: Solid

Vapor Pressure: 1 mm at 62.0°C

Vapor Density:

Boiling Point: 219.5°C (sublimes)

Melting Point: 68°C

Density: 0.9680 at 20°C/4°C

Solubility: Soluble (H₂O)

**Octanol/Water Parti-
tion Coefficient:**

Environmental Persistence

BOD: 31% of theoretical

Atmospheric Reactivity:

Safety Hazard:

Fire—slight

3, 5-Xylenol

PRODUCTION DATA

Annual U.S.
Production:

Consumption:

Fraction of
Dispersion:

Fraction of Pro-
duction Lost:

Release Rate (million lbs/yr):

TOXICITY DATA

Acute Toxicity

LD₅₀

LD_{Lo}

Dosage

1070 mg/kg

1750 mg/kg

Animal

mouse

guinea pig

Route

oral

subcutaneous

Chronic Toxicity

U.S. Occupational Standard: (air) TWA: 100 ppm

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

Zinc stearate

CHEMICAL NAME

CAS Number: 557-05-1

Chemical Name: Octadecanoic acid, zinc salt

Synonyms: Stearic acid, zinc salt

Molecular Formula: $(C_{18}H_{35}O_2)_2 \cdot Zn$

Structure: $[CH_3(CH_2)_{16}COO^-]_2 Zn^{2+}$

Chemical Properties

Molecular Weight: 632.30

Physical State: Solid

Vapor Pressure:

Vapor Density:

Boiling Point:

Melting Point: 130°C

Density: 1.095

Solubility: Insoluble (H₂O)

Octanol/Water Partition Coefficient:

Environmental Persistence

BOD:

Atmospheric Reactivity:

Safety Hazard:

Fire—slight

Zinc stearate

PRODUCTION DATA

**Annual U.S.
Production:** 19.4×10^6 lbs.

Consumption: 19.4×10^6 lbs.

**Fraction of
Dispersion:** 1.0

**Fraction of Pro-
duction Lost:** 0.03

Release Rate (million lbs/yr): 20.0

TOXICITY DATA

Acute Toxicity	Dosage	Animal	Route
----------------	--------	--------	-------

Non-lethal Acute Effects:
Pulmonary fibrosis

Chronic Toxicity

U.S. Occupational Standard:

Carcinogenicity:

Mutagenicity:

Teratogenicity:

TLV:

Other Chronic Effects:

CHEMICAL NAME INDEX

	<u>Page</u>
Acenaphthylene	AI-2
Acetaldehyde	AI-6
Acetamide	AI-10
Acetanilide	AI-14
Acetic acid	AI-16
Acetic acid, butyl ester	AI-160
Acetic acid, sec butyl ester	AI-162
Acetic acid, decyl ester	AII-90
Acetic acid, 1,1-dimethylethyl ester	AI-164
Acetic acid, ethyl ester	AII-234
Acetic acid, isobutyl ester	AIII-62
Acetic acid, methyl ester	AIII-148
Acetic acid, 1-methylethyl ester	AIII-84
Acetic acid, pentyl ester	AI-64
Acetic acid, propyl ester	AIV-108
Acetic acid, sodium salt	AIV-140
Acetic anhydride	AI-18
Acetoacetic acid, ethyl ester	AII-236
Acetoacetic acid, methyl ester	AIII-150
Acetone	AI-20
Acetonitrile	AI-24
3-(α -Acetonylbenzyl)-4-hydroxycoumarin	AIV-294
Acetophenone	AI-26
Acetylene	AI-28
Acrolein	AI-34
Acrylamide	AI-36
Acrylic acid	AI-38
Acrylic acid, butyl ester	AI-166
Acrylic acid, ethyl ester	AII-238
Acrylonitrile	AI-40
Adipic acid	AI-42
Adipic acid, bis(2-ethylhexyl)ester	AII-104
Allyl alcohol	AI-48
1-Allylnaphthalene	AI-54
o-Aminobenzenesulfonic acid	AIV-162
p-Aminobenzoic acid	AI-58
3-Amino-2,5-dichlorobenzoic acid	AI-56
2-Aminoethanol	AII-230
2-[(2-Aminomethyl)amino]-ethanol	AI-62
4-[(4-Aminophenyl)(4-imino-2,5-cyclohexadien-1-ylidene)-methyl]-2-methyl benzenamine	AIII-112
4-Amino-3,5,6-trichloropicolinic acid	AIV-52
Aniline	AI-78
Anilidine hydrochloride	AI-80

CHEMICAL NAME INDEX (Continued)

	<u>Page</u>
o-Anisidine	AI-82
p-Anisidine	AI-82
Anisole	AI-84
Anthranilic acid	AI-86
Anthraquinone	AI-88
Aroclor 1254 and 1260	AIV-66
Benzaldehyde	AI-98
Benzamide	AI-100
Benzene	AI-102
1,2-Benzenedicarboxylic acid, bis (8-methylnonyl)ester	AII-122
1,2-Benzenedicarboxylic acid, dioctyl ester	AII-124
m-Benzene disulfonic acid	AI-104
Benzene methanamine	AI-130
Benzene sulfonic acid	AI-106
Benzidine	AI-108
Benzil	AI-110
Benzilic acid	AI-112
Benzoic acid	AI-114
Benzoic acid, benzyl ester	AI-134
Benzoic acid, sodium salt	AIV-142
Benzoin	AI-116
Benzonitrile	AI-118
Benzophenone	AI-120
p-Benzoquinone	AI-122
Benzoyl chloride	AI-126
Benzyl alcohol	AI-128
Biphenyl	AII-182
4-Biphenyl amine	AI-60
Bis-(2-butoxyethyl)ether	AII-82
N,N-Bis(carboxymethyl)glycine, trisodium salt	AIII-258
Bis(2-chloroethyl)ether	AII-50
Bis(α,α -dimethylbenzyl)peroxide	AII-68
Bis(dimethylthiocarbamoyl)disulfide	AIV-206
Bis(2-ethoxyethyl) ether	AII-84
2,2-Bis(hydroxymethyl)-1,3-propanediol	AIV-18
Bis-(2-methylpropyl)carbamothioic acid, S-ethyl ester	AIV-168
Bromobenzene	AI-146
5-Bromo-3-sec-butyl-6-methyluracil	AI-144
Bromomethane	AII-248
Bromomethane	AIII-166
2-Bromonaphthalene	AI-148
1,3-Butadiene	AI-150
(S)2-Butanamine	AI-176
Butane	AI-152
1,3-Butanediol	AI-184
1-Butanethiol	AI-188

CHEMICAL NAME INDEX (Continued)

	<u>Page</u>
2-Butanone	AI-192
1-Butene	AI-154
2-Butene	AI-156
Butene, homopolymers	AI-64
2-Butoxyethanol	AI-158
α -[2-(2-Butoxyethoxy)ethoxy]-4,5-(methylenedioxy)- 2-propyltoluene	AI-58
(Butoxymethyl)oxirane	AI-186
Butyl alcohol	AI-168
sec-Butyl alcohol	AI-170
tert-Butyl alcohol	AI-172
t-Butylamine	AI-178
p-tert-Butylphenol	AI-190
p-tert-Butyltoluene	AI-192
Butyraldehyde	AI-174
Butyric acid	AI-194
Butyric anhydride	AI-196
Butyronitrile	AI-198
Calcium propionate	AI-204
Camphor	AI-208
Carbamic acid, 2,3-dihydro-2,2-dimethyl- 7-benzofuranyl ester	AI-216
Carbondisulfide	AI-218
4,4'-Carbonimidoyl bis[N,N-dimethyl]benzenamine	AI-90
Carbon tetrabromide	AI-220
Carbon tetrachloride	AI-222
Castor oil	AI-224
Cellulose acetate	AI-226
Cellulose, carboxymethyl ether, sodium salt	AI-144
Cellulose, ethyl ether	AI-252
Chloroacetaldehyde	AI-232
Chloroacetic acid	AI-234
Chloroacetic acid, ethyl ester	AI-256
Chloroacetic acid, sodium salt	AI-146
2-Chloroacetophenone	AI-236
m-Chloroaniline	AI-238
o-Chloroaniline	AI-240
p-Chloroaniline	AI-242
2-Chloro-4,6-bis(ethylamino)-s-triazine	AI-90
2-Chloro-4,6-bis(isopropylamino)-s-triazine	AI-100
o-Chlorobenzaldehyde	AI-244
p-Chlorobenzaldehyde	AI-246
Chlorobenzene	AI-248
Chlorobenzoic acid (2,3, and 4)	AI-252
o-Chlorobenzoyl chloride	AI-254
o-Chlorobenzylidene malonitrile	AI-256

CHEMICAL NAME INDEX (Continued)

	<u>Page</u>
3-Chloro-1,3-butadiene	AI-282
m-Chlorocarbanilic acid, isopropyl ester	AI-284
2-Chloro-N-(2,6-diethylphenyl)-N-(methoxymethyl)acetamide	AI-44
Chlorodifluoroethane	AI-258
Chlorodifluoromethane	AI-260
1-Chloro-2,3-epoxypropane	AII-224
Chloroethane	AII-254
2-Chloroethanol	AII-264
2-Chloro-4-ethylamino-6-isopropylamino-s-triazine	AI-262
Chloroethylene	AIV-288
Chloroethylene, polymers	AIV-88
Chloroform	AI-264
Chloromethane	AIII-174
2-Chloro-N-(1-methylethyl)-N-phenylacetamide	AIV-92
3-Chloro-2-methylpropene	AIII-136
1-Chloronaphthalene	AI-266
1-Chloro-3-nitrobenzene	AI-268
1-Chloro-2-nitrobenzene	AI-270
1-Chloro-4-nitrobenzene	AI-272
1-Chloro-1-nitropropane	AI-274
1-Chloropentane	AI-70
m-Chlorophenol	AI-276
p-Chlorophenol	AI-278
p-Chlorophenol	AI-280
1-Chloropropane	AIV-114
2-Chloropropane	AIII-90
2-Chloro-1-propanol	AIV-118
3-Chloropropene	AI-50
α-Chlorotoluene	AI-136
m-Chlorotoluene	AI-286
o-Chlorotoluene	AI-288
p-Chlorotoluene	AI-290
C.I. Solvent Yellow 2	AII-138
Citric acid	AI-292
Coal tar naphtha	AIII-238
m-Cresol	AI-296
o-Cresol	AI-298
p-Cresol	AI-300
(E)-Crotonaldehyde	AI-302
Crotonic acid	AI-304
Cumene	AI-306
Cyanoacetic acid	AI-310
Cyanoacetic acid, ethyl ester	AII-258
Cyanogen chloride	AI-312
Cyclohexane	AI-318

CHEMICAL NAME INDEX (Continued)

	<u>Page</u>
Cyclohexanol	AI-320
Cyclohexanone	AI-322
Cyclohexene	AI-324
4-Cyclohexene-1,2-dicarboxylic acid	AIV-192
Cyclohexylamine	AI-326
1,3-Cyclopentadiene	AI-328
Decahydronaphthalene	AII-12
Decyl alcohol	AII-14
N,N-diethyl-m-toluamide	AII-16
N,N-diallyl-2-chloroacetamide	AIV-128
3,5-Diaminobenzoic acid	AII-22
Diazomethane	AII-26
1,2-Dibromo-3-chloropropane	AII-8
1,2-Dibromomoethane	AII-268
Dibromodifluoromethane	AII-28
2,6-Di-tert-butyl-p-cresol	AII-30
2,4-Dichloroaniline	AII-34
3,4-Dichloroaniline	AII-36
o-Dichlorobenzene	AII-38
p-Dichlorobenzene	AII-40
3,3'-Dichlorobenzidine	AII-42
Dichlorodifluoromethane	AII-44
1,3-Dichloro-5,5-dimethylhydantoin	AII-46
1,1-Dichloroethane	AII-312
1,2-Dichloroethane	AII-270
1,1-Dichloroethylene	AIV-290
1,2-Dichloroethylene (Z and E)	AII-48
4,4'-Dichlorobenzilic acid, ethyl ester	AI-250
Dichlorofluoromethane	AII-52
Dichloromethane	AIII-186
3,6-Dichloro-2-methoxybenzoic acid	AI-94
1,5-Dichloropentane	AII-56
(2,4-Dichlorophenoxy)acetic acid	AII-58
2-(2,4-Dichlorophenoxy)ethanol,hydrogensulfate, sodium salt	AI-294
3-(3,4-Dichlorophenyl)-1,1-dimethylurea	AII-200
3-(3,4-Dichlorophenyl)-1-methoxy-1-methylurea	AIII-110
N-(3,4-Dichlorophenyl)propanamide	AIV-96
1,2-Dichloropropane	AII-60
1,3-Dichloro-2-propanol	AII-54
1,3-Dichloropropene	AII-62
2,2-Dichloropropionic acid, sodium salt	AII-4
Dichlorotetrafluoroethane	AII-64
α,α-Dichlorotoluene	AI-138
4,4'-Dichloro-α-(trichloromethyl)benzhydrol	AII-66
Dicyclohexylamine	AII-70

CHEMICAL NAME INDEX (Continued)

	<u>Page</u>
Diethylacetal acetaldehyde	AI-4
Diethylamine	AII-76
2-(Diethylamino)ethanol	AII-78
Diethyleneglycol	AII-80
2,2'-Diethylenetriamine	AII-102
α,α -Diethyl-4,4'-stilbenediol	AII-108
1,1-Difluoroethane	AII-112
1,2-Dihydro-3,6-pyridazinedione	AIII-120
1,2-Dihydro-2,2,4-trimethylquinoline	AII-116
Diisobutylene	AII-118
Diisopropylamine	AII-126
3,3'-Dimethoxybenzidine	AII-132
Dimethoxymethane	AIII-152
(E)-3[(Dimethoxyphosphinyl)oxy]-2-butenic acid, methyl ester	AIII-224
Dimethylacetal acetaldehyde	AII-280
N,N-Dimethylacetamide	AII-134
Dimethylamine	AII-136
N,N-Dimethylaniline	AII-140
3,3'-Dimethylbenzidine	AIV-208
α,α -Dimethylbenzylhydroperoxide	AI-308
1,1'-Dimethyl-4,4'-bipyridium dichloride	AIV-12
1,3-Dimethylbutyl acetate	AII-142
(1,1-Dimethylethyl) benzoic acid	AI-180
N,N-Dimethylformamide	AII-146
1,1-Dimethylhydrazine	AII-148
1,2-Dimethylhydrazine	AII-150
2,6-Dimethyl-4-heptanone	AII-120
N-(1,4-Dimethylpentyl)-N'phenyl-p-phenylene-diamine	AII-152
2,6-Dimethylphenol	AIV-304
3,5-Dimethylphenol	AIV-306
N,N-Dimethyl- α -phenylbenzeneacetamide	AII-180
O,O-Dimethylphosphorodithioic acid, O-(p-nitrophenyl)ester	AIII-214
1,1-Dimethyl-3-(α,α,α -trifluoro-m-tolyl)urea	AIII-6
1,2-Dinitrobenzene	AII-164
1,3-Dinitrobenzene	AII-164
1,4-Dinitrobenzene	AII-164
2,4-Dinitrobenzoic acid	AII-166
Dinitrophenol	AII-170
2,4-Dinitrotoluene	AII-172
p-Dioxane	AII-176
1,3-Dioxolane	AII-178
1,3-Dioxolan-2-one	AII-262
Diphenylamine	AII-184

CHEMICAL NAME INDEX (Continued)

	<u>Page</u>
Diphenylmethane	AI-132
Dipropylcarbamothioic acid, S-propyl ester	AIV-284
Dipropylene glycol	AII-190
Dipropylene glycol, monomethyl ether	AII-192
1,1a,2,2,3,3a,4,5,5,5a,5b,6-Dodecachloro- octahydro-1,3,4-metheno-1H-cyclobuta(Cd) pentalene	AIII-226
Dodecane	AII-202
1-Dodecanethiol	AII-208
1-Dodecene	AIV-202
Dodecyl benzene	AII-204
Dodecylbenzenesulfonic acid, sodium salt	AII-206
Dodecylguanidine, monoacetate	AI-330
Dodecylphenol	AII-210
Ethane	AII-228
Ethanethiol	AII-314
Ethanol	AII-240
Ethanol, homopolymers	AIV-86
2-Ethoxyethanol	AII-286
2-Ethoxyethanol acetate	AII-288
2-(2-Ethoxyethoxy)ethanol	AII-92
2-(2-Ethoxyethoxy)ethanol acetate	AII-94
Ethanamine	AII-242
Ethylbenzene	AII-246
Ethylbenzene, homopolymer	AIV-80
S-Ethyldipropylthiocarbamate	AII-226
Ethylene	AII-261
Ethylene bis(dithiocarbamic acid), disodium salt	AIII-234
Ethylene glycol	AII-272
Ethylene glycol, diacetate	AII-274
Ethylenediamine	AII-266
Ethylene glycol, diethyl ether	AII-278
Ethylene glycol, monoacetate	AII-282
Ethylene oxide	AII-304
Ethylene, polymers	AIV-68
Ethyleneimine	AII-302
Ethyl ether	AII-306
2-Ethyl-1-hexanol	AII-310
4-Ethylmorpholine	AII-318
1-Ethyl-naphthalene	AII-320
N-Ethyl-N-nitrosourea	AIII-290
Ethylphosphonodithioic acid, O-ethyl-S-phenyl ester	AII-218
Ferbam	AIII-2

CHEMICAL NAME INDEX (Continued)

	<u>Page</u>
Ferrocene	AIII-4
N-Fluoren-2-yl-acetamide	AI-12
Formaldehyde	AIII-12
Formamide	AIII-14
Formic acid	AIII-16
Formic acid, ethyl ester	AII-308
Formic acid, methyl ester	AIII-194
Formic acid, sodium salt	AIV-148
Fumaric acid	AIII-18
2-Furaldehyde	AIII-20
Furfuryl alcohol	AIII-22
D-Glucitol	AIV-154
L-Glutamic acid, monosodium salt	AIII-228
Glycerol	AIII-24
Glycine	AIII-30
Glyoxal	AIII-32
Guanidine	AIII-34
1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4, 7-methanoindene	AIII-38
3-Heptanone	AII-250
3-Heptene (Z and E)	AIII-40
1,2,3,4,5,6-Hexachlorocyclohexane(gamma isomer)	AIII-108
1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7, 8,8a-octahydro-1,4,5,8-dimethanonaphthalene	AII-72
Hexachloroethane	AIII-44
1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro- 1,4,5,8-dimethanonaphthalene	AI-46
Hexachloronaphthalene	AIII-46
1,4,5,6,7,7-Hexachloro-5-norbornene-2, 3-dimethanol, cyclic sulfite	AII-220
Hexahydro-2H-azepin-2-one	AI-210
3-(Hexahydro-4,7-methanoindan-5-yl)-1, 1-dimethylurea	AIII-42
Hexamethylenetetramine	AIII-50
1,6-Hexanediamine	AIII-52
1,6-Hexanediol	AIII-48
2-(Hexyloxy)ethanol	AII-290
2-[2-(Hexyloxy)ethoxy]ethanol	AII-96
Hydrocyanic acid	AIII-54
α-Hydro-O-hydroxypoly[oxy(methyl-1,2-ethanediyl)]	AIV-78
Hydroquinone	AIII-56
3-Hydroxybutyraldehyde	AI-8
Hydroxymethyl arsine oxide	AI-202
4-Hydroxy-4-methyl-2-pentanone	AII-20

CHEMICAL NAME INDEX (Continued)

	<u>Page</u>
2,2'-Iminodiethanol	AII-74
1H-Indene	AIII-58
Iodomethane	AIII-198
Isopentyl alcohol	AIII-60
2-(2-Isobutoxyethoxy)ethanol	AII-88
Isobutyl alcohol	AIII-64
Isobutyraldehyde	AIII-66
Isobutyric acid	AIII-70
Isocyanic acid, methyl ester	AIII-204
Isocyanic acid,2-methyl-m-phenylene ester	AIV-214
Isodecyl alcohol	AIII-72
1H-Isoindole-1,3(2H)-dione	AIV-46
Isooctanol	AIII-74
Isooctyl alcohol	AIV-2
26-(Isooctylphenoxy)-3,6,9,12,15,18,21,24-octa- oxahexacosan-1-ol	AIII-76
Isophthalic acid	AIII-80
Isoprene	AIII-82
Isopropyl alcohol	AIII-86
Isopropylamine	AIII-88
Isopropyl ether	AIII-92
4,4'-Isopropylidenediphenol	AI-142
o-Isopropyl phenol	AIII-94
p-Isopropyl phenol	AIII-96
Ketene	AIII-98
Ligninsulfonic acid, ammonium salt	AIII-100
Ligninsulfonic acid, calcium salt	AIII-102
Ligninsulfonic acid, sodium salt	AIII-106
Ligninsulfonic acid, ferrochrome salt	AIII-104
Maleic acid	AIII-116
Maleic anhydride	AIII-118
Malic acid (DL,D and L)	AIII-122
Melamine	AIII-124
Mercaptosuccinic acid, diethyl ester, S-ester with O,O-dimethyl phosphorodithioate	AIII-114
Methacrylic acid	AIII-130
Methacrylic acid, methyl ester	AIII-208
Methacrylonitrile	AIII-132
Methane	AIII-138
Methane arsonic acid	AIII-140
Methane arsonic acid, disodium salt	AII-194
Methane arsonic acid, monosodium salt	AIII-232
Methanesulfonic acid, ethyl ester	AII-316
Methanethiol	AIII-206
Methanol	AIII-154

CHEMICAL NAME INDEX (Continued)

	<u>Page</u>
2-Methoxyethanol	AIII-146
2-Methoxyethanol acetate	AII-294
2-(2-Methoxyethoxy)ethanol	AII-98
2-(2-Methoxyethoxy)ethanol acetate	AII-100
2-[-2-(2-Methoxyethoxy)ethoxy]ethanol	AIV-268
1-Methoxy-4-nitrobenzene	AIII-262
Methylamine	AIII-156
N-([(Methylamino)carbonyl]oxy)ethanimidothioic acid, methyl ester	AIII-142
N-Methylaniline	AIII-162
2-Methylaziridine	AIV-122
α -Methylbenzenemethanol	AIII-220
α -Methylbenzyl alcohol	AIII-164
2-Methyl-2-butene	AIV-22
Methyl-1-n-butyl ketone	AIII-168
3-(1-Methylbutyl)phenol methylcarbamate	AI-200
2-Methyl-3-butyne-2-ol	AIII-170
Methylcarbamic acid, 1-naphthyl ester	AI-214
3-Methylcholanthrene	AIII-176
Methylcyclohexane	AIII-178
Methylcyclohexanol	AIII-180
2-Methylcyclohexanone	AIII-182
2-Methyl-4,6-dinitrophenol	AII-168
Methyldioxolane	AIII-190
4,4'-Methylene bis(2-chloroaniline)	AIII-184
4,4'-Methylenedianiline	AIII-188
4-Methylene-2-oxetanone	AII-128
Methyl ether	AII-144
Methyl ether cellulose	AIII-172
4-Methyl-3-heptanone	AII-244
5-Methyl-2-hexanone	AIII-200
Methylhydrazine	AIII-196
2-Methyl lactonitrile	AI-22
2-Methyl-2-(methylthio)propionaldehyde-O- methyl-carbamoyl)oxime	AIV-176
Methylnaphthalene	AIII-210
N-Methyl-N'-nitro-N-nitrosoguanidine	AIII-212
N-Methyl-N-nitrosourea	AIII-292
2-Methyl-2,4-pentanediol	AIII-216
Methylamyl alcohol	AIII-160
4-Methyl-2-pentanol, acetate	AIII-158
4-Methyl-2-pentanone	AIII-202
4-Methyl-3-penten-2-one	AIII-128
3-Methyl-1-pentyne-3-ol	AIII-218

CHEMICAL NAME INDEX (Continued)

	<u>Page</u>
Methylphosphoramidic acid, 4-tert-butyl-2-chlorophenylmethyl ester	AIV-134
1-Methylpropene	AI-182
2-Methyl-1-propene	AIII-68
2-Methyl-1-propene, homopolymer	AIV-272
2-Methyl-2-propen-1-ol	AIII-134
2-(1-Methylpropyl)-4,6-dinitrophenol	AII-174
α-Methylstyrene	AIII-222
p-Methylstyrene	AIV-292
Methylsulfide	AII-158
4-(Methylsulfonyl)-2,6-dinitro-N,N-dipropylaniline	AIV-60
Methylsulfoxide	AII-160
N-methyl-N,2,4,6-tetranitroaniline	AIV-204
Monostearin	AIII-26
Morpholine	AIII-230
Naphthalene	AIII-240
1-Naphthalenesulfonic acid	AIII-242
2-Naphthalenesulfonic acid	AIII-244
1-Naphthol	AIII-246
2-Naphthol	AIII-248
1-Naphthylamine	AIII-250
2-Naphthylamine	AIII-252
2-[(1-Naphthalenylamino)carbonyl]benzoic acid, monosodium salt	AIII-254
Nitrate cellulose	AIII-268
2,2',2''-Nitrilotriethanol	AIV-260
p-Nitroaniline	AIII-260
Nitrobenzene	AIII-264
p-Nitrobenzoic acid	AIII-266
Nitroethane	AIII-270
Nitroglycerine	AIII-272
Nitromethane	AIII-274
o-Nitrophenol	AIII-278
3-Nitrophenol	AIII-276
p-Nitrophenol	AIII-280
1-Nitropropane	AIII-282
2-Nitropropane	AIII-284
N-Nitrosodiethylamine	AIII-286
N-Nitrosodimethylamine	AIII-288
m-Nitrotoluene	AIII-294
o-Nitrotoluene	AIII-296
p-Nitrotoluene	AIII-298
Nonene	AIII-300
Nonoylphenol	AIII-302
1,2,4,5,6,7,8,8-Octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan	AI-230

CHEMICAL NAME INDEX (Continued)

	<u>Page</u>
Octadecanoic acid, zinc salt	AIV-308
2-(Octyloxy)ethanol	AII-296
Octylphenol	AIV-6
7-Oxabicyclo(2.2.1)heptane-2,3-dicarboxylic acid	AII-222
Oxalic acid	AIV-8
Oxalic acid, diethyl ester	AII-322
2-Oxetanone	AIV-102
1,1'-Oxybis[2-methoxyethane]	AII-86
Oxybis(chloromethane)	AI-140
Pentachloronitrobenzene	AIV-14
Pentachlorophenol	AIV-16
Pentane	AIV-20
1-Pentanethiol	AI-76
1-Pentene	AI-72
Pentyl alcohol	AI-66
Pentylamine	AI-68
Pentyl ether	AI-74
o-Phenetidine	AIV-28
p-Phenetidine	AIV-30
Phenol	AIV-32
Phenol, sodium salt	AIV-150
Phenothiazine	AIV-34
2-Phenoxyethanol	AII-298
o-Phenylenediamine	AIV-38
p-Phenylenediamine	AIV-40
Phenyl ether	AII-186
Phenylhydrazine	AIV-36
Phosgene	AIV-42
Phosphoric acid, 1,2-dibromo-2,2-dichloroethyl dimethyl ester	AIII-236
Phosphoric acid, (Z)dimethyl-1-methyl-3(methylamino)- 2-oxo-1-propenyl ester	AI-92
Phosphoric acid, tributyl ester	AIV-232
Phosphoric acid, tri-o-tolyl ester	AIV-256
Phosphorodithioic acid, S-[(p-chlorophenyl)thio] methyl]-0,0-diethyl ester	AIV-280
Phosphorodithioic acid, 0,0-diethyl-S-[2(ethylthio) ethyl] ester	AII-196
Phosphorodithioic acid, 0,0-diethyl-0-(3,5,6- trichloro-2-pyridinyl) ester	AII-216
Phosphorodithioic acid, 0,0-dimethyl ester, S-ester with 3-(mercaptomethyl)-1,2,3-benzotriazin-4(3H)-one	AIII-36

CHEMICAL NAME INDEX (Continued)

	<u>Page</u>
Phosphorodithioic acid, S-ester with 2-mercapto-N-methylacetamide 0,0-dimethyl ester	AII-130
Phosphorodithioic acid, S,S'-methylene 0,0,0',0'-tetraethyl ester	AII-232
Phosphorothioic acid, 0,0-diethyl-0-(2-isopropyl-6-methyl-4-pyrimidyl) ester	AII-24
Phosphorothioic acid, 0,0-diethyl-0-[p-(methylsulfinyl)phenyl]ester	AII-6
Phosphorothioic acid, 0,0-diethyl-0-(p-nitrophenol) ester	AII-324
Phosphorothioic acid, 0,0-dimethyl-0-(2,4,5-trichlorophenyl)ester	AIV-132
Phosphorotrithious acid, tributyl ester	AIII-8
Phthalic acid, bis(2-ethylhexyl)ester	AII-106
Phthalic acid, decyl octyl ester	AIV-4
Phthalic acid, dibutyl ester	AII-32
Phthalic acid, dimethyl ester	AII-154
Phthalic acid, ditridecyl ester	AII-198
Phthalic anhydride	AIV-44
Phthalonitrile	AIV-48
β -Picoline	AIV-50
Piperazine	AIV-56
Pivalic acid	AIII-256
Polyethylene glycol chloride	AIV-72
Polyethylene glycols	AIV-70
Poly(oxy-1,2-ethanediylloxycarbonyl-1,4-phenylenecarbonyl)	AIV-74
Polystyrene, thermoplastic resins	AIV-80
Propane	AIV-94
1,2-Propanediol	AIV-120
2-Propenamide, homopolymer	AIV-62
Propene	AIV-116
1-Propene, homopolymer	AIV-76
Propene oxide	AIV-124
Propionaldehyde	AIV-104
Propionic acid	AIV-106
2-Propoxyethanol	AII-300
Propyl alcohol	AIV-110
Propylamine	AIV-112
Propyne	AI-52
2-Propyn-1-ol	AIV-98
Pyridine	AIV-126
Resorcinol	AIV-130
Salicylic acid	AIV-136
Silicic acid, tetraethyl ester	AII-326

CHEMICAL NAME INDEX (Continued)

	<u>Page</u>
Sorbic acid	AIV-152
Stearic acid, calcium salt	AI-206
Styrene	AIV-156
Succinic acid	AIV-158
Succinonitrile	AIV-160
Sulfobutanedioic acid, 1,4-bis(2-ethylhexyl)ester, sodium salt	AIV-166
Sulfuric acid, diethyl ester	AII-110
Sulfuric acid, dimethyl ester	AII-156
Sulfuric acid, monododecyl ester, compounded with 2,2',2''-nitrilotris[ethanol](1:1)	AII-214
Sulfuric acid, monododecyl ester, sodium salt	AII-212
Terephthalic acid	AIV-174
Terephthalic acid, dimethyl ester	AII-162
2,3,5,6-Tetrachloro-p-benzoquinone	AI-228
1,1,2,2-Tetrabromoethane	AI-30
2,3,5,6-Tetrachloro-1,4-benzenedicarboxylic acid, dimethyl ester	AII-2
1,1,1,2-Tetrachloro-2,2-difluoroethane	AIV-180
1,1,2,2-Tetrachloro-1,2-difluoroethane	AIV-178
1,1,2,2-Tetrachloroethane	AI-32
Tetrachloroethylene	AIV-24
N-(1,1,2,2-Tetrachloroethylthio)-4-cyclohexone-1, 2-dicarboximide	AII-114
1,2,3,4-Tetrachloro-1,2,3,4-tetrahydronaphthlene	AIV-182
Tetrachlorophthalic anhydride	AIV-184
Tetraethylplumbane	AIV-186
Tetrafluoroethene	AIV-84
Tetrahydrofuran	AIV-188
1,2,3,4-Tetrahydronaphthalene	AIV-190
Tetrahydrothiophene-1,1-dioxide	AIV-164
N,N,N',N'-Tetramethyl-ethylenediamine	AIV-194
Tetramethylplumbane	AIV-196
Tetramethyl succinonitrile	AIV-198
Tetranitromethane	AIV-200
2,5,8,11-Tetraoxadodecane	AIV-266
Thiocarbanilide	AII-188
Toluene	AIV-210
Toluene-2,4-diamine	AIV-212
p-Toluenesulfonylamide	AIV-216
o-Toluenesulfonic acid	AIV-218
p-Toluenesulfonic acid	AIV-220
p-Toluenesulfonyl chloride	AIV-222
m-Toluidine	AIV-224
o-Toluidine	AIV-226

CHEMICAL NAME INDEX (Concluded)

	Page
p-Toluidine	AIV-228
Toxaphene	AIV-230
s-Triazine-2,4,6-triol	AI-314
S,S,S,-Tributyl phosphorotrithioate	AII-18
Trichloroacetic acid	AIV-172
2,4,6-Trichloroaniline	AIV-234
3,5,6-Trichloro-o-anisic acid	AI-96
1,2,4-Trichlorobenzene	AIV-236
2,3,6-Trichlorobenzoic acid	AIV-170
1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane	AII-10
1,1,1-Trichloro-2,2-bis(p-methoxyphenyl)ethane	AIII-144
1,1,1-Trichloroethane	AIV-240
1,1,2-Trichloroethane	AIV-238
Trichloroethylene	AIV-242
Trichlorofluoromethane	AIV-244
Trichloromethanethiol	AIV-26
N(Trichloromethyl)thio-4-cyclohexene-1, 2-dicarboximide	AI-212
N-[(Trichloromethyl)thio]phthalimide	AIII-10
1,4,6-Trichloronaphthalene	AIV-248
(2,4,5-Trichlorophenoxy)acetic acid	AIV-250
2-(2,4,5-Trichlorophenoxy)propionic acid	AIV-138
1,2,3-Trichloropropane	AIV-252
α,α,α -Trichlorotoluene	AI-124
2,4,6-Trichloro-s-triazine	AI-316
1,3,5-Trichloro-s-triazine-2,4,6-(1H,3H,5H)-trione	AIV-246
1,1,2-Trichloro-1,2,2-Trifluoroethane	AIV-254
p-Tridecylbenzenesulfonic acid, sodium salt	AIV-258
Triethylamine	AIV-262
Triethylene glycol	AIV-264
α,α,α -Trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine	AIV-270
Trimethylamine	AIV-274
1,3,4-Trimethylbenzene	AIII-126
2,6,6-Trimethylbicyclo(3.1.1)hept-1-ene	AIV-54
2,6,6-Trimethylbicyclo(3.1.1)hept-2-ene	AIV-54
3,5,5-Trimethyl-2-cyclohexen-1-one	AIII-78
2,2,4-Trimethyl-1,3-pentanediol	AIV-276
2,4,6-Trimethyl-S-trioxane	AIV-10
2,4,6-Trinitrotoluene	AIV-278
Urea	AIV-282
Vinyl acetate	AIV-286
m-Xylene	AIV-296
o-Xylene	AIV-298
p-Xylene	AIV-300
3,4-Xylenesulfonic acid, sodium salt	AIV-302

TECHNICAL REPORT DATA <i>(Please read Instructions on the reverse before completing)</i>		
1. REPORT NO. EPA-450/3-77-008e	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Preliminary Scoring of Organic Air Pollutants: Chemistry, Production and Toxicity of Selected Synthetic Organic Chemicals (Chemicals O-Z) Appendix IV	5. REPORT DATE October 1976	6. PERFORMING ORGANIZATION CODE
	8. PERFORMING ORGANIZATION REPORT NO.	
7. AUTHOR(S) J. Dorigan, B. Fuller, R. Duffy	10. PROGRAM ELEMENT NO.	
9. PERFORMING ORGANIZATION NAME AND ADDRESS The Mitre Corporation Metrek Division Westgate Research Park McLean, Virginia 22101	11. CONTRACT/GRANT NO. 68-02-1495	
	13. TYPE OF REPORT AND PERIOD COVERED	
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Air Quality Planning and Standards Strategies and Air Standards Division Research Triangle Park, N.C. 27711	14. SPONSORING AGENCY CODE	
	15. SUPPLEMENTARY NOTES	
16. ABSTRACT This is the fourth of a series of four appendices to the report "Scoring of Organic Air Pollutants." The entire appendix contains a compilation of available data on chemical structure and properties, environmental persistence, production, and toxicity for 637 synthetic organic chemicals.		
17. KEY WORDS AND DOCUMENT ANALYSIS		
a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
organic chemical structure organic chemical properties organic chemical production organic chemical toxicity		
18. DISTRIBUTION STATEMENT unlimited	19. SECURITY CLASS (This Report) unclassified	21. NO. OF PAGES 331
	20. SECURITY CLASS (This page) unclassified	22. PRICE