



CHEMICAL MANUFACTURERS ASSOCIATION

August 29, 1989

Dear Vinyl Chloride Panel Members:

The Illinois Environmental Protection Agency is proposing a listing of air toxics within the State of Illinois. Listed chemicals will be subject to control requirements at a future date.

Vinyl Chloride is one of the chemicals proposed for regulation by the Illinois EPA.

Several groups within CMA are considering providing comments on this proposed listing of air toxics. If you would like to provide comments or need additional information, please call me at 202/887-1293.

Sincerely,

Susan R. Howe
Manager
Vinyl Chloride Panel

CONFIDENTIAL
Subject to Protective Order in
Ross v. Conoco, Inc., No. 90-4837
14th Judicial District Court
Calcasieu Parish, Louisiana



Illinois Environmental Protection Agency . P.O. Box 19276, Springfield, IL 62794-9276

**BASIS FOR SELECTION OF
AIR TOXICS CANDIDATES**

For Distribution by CMA
CHEMSTAR DIVISION
From Howe Susan R
Ref. No. Vinyl Chloride
Date 8/30/89

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July 31, 1989

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14th Judicial District Court
Calcasieu Parish, Louisiana

CMA 010241

Legend for Selection Basis Entries

For carcinogens, the entries include:

- classification of carcinogenicity (source)
- classifications are either known or probable human carcinogens
- sources include one or more of the following sources,

NTP - National Toxicology Program
IARC - International Agency for Research on Cancer
EPA - U.S. EPA Carcinogen Assessment Group
ACGIH - American Conference of Governmental Industrial Hygienists

For non-carcinogenic air toxicants, the entries include:

- acute lethality value (lethality score)
- subacute value (subacute score)
- systemic (toxic) effect [severity of effects score] @ lowest toxic dose value [lowest toxic dose score] (integrated systemic toxicity score)

Abbreviations

mg/kg = milligrams per kilogram
mg/cu m = milligrams per cubic meter
ppm = parts per million
mg/kg-day = milligrams per kilogram per day
Cat = category

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Subject to Protection
Ross v. Corrojo, Inc., No. 17
14th Judicial District Court
Calcasieu Parish, Louisiana

7/31/89

Basis for Selection of Air Toxics Candidates

Option				Chemical	Selection Basis
1	2	3	4		
X				Acrylamide	Probable Human Carcinogen (ACGIH)
X	X	X	X	Acrylic acid	Air Toxicant, score = 7.00 Acute: 33.5 mg/kg (3) Subacute: 30 mg/cu m (2) Systemic: Lesions of nasal mucosa [mild effect on Cat. III organ = 2] @ 5 ppm [0.19 mg/kg-day = 4] (2.00)
X	X	X	X	Acrylonitrile	Probable Human Carcinogen (NTP, IARC, EPA, ACGIH)
X	X	X	X	Alkylated lead compounds	Listed by International Joint Commission
X	X	X	X	Aniline	Air Toxicant, score = 9.25 Acute: 250 mg/kg (2) Subacute: 10 mg/cu m (2) Systemic: Methemoglobinemia [definite effect on Cat. I organ = 7] @ 5 ppm [6.3 mg/kg-day = 3] (5.25)
X	X	X	X	Arsenic and compounds	Known Human Carcinogen (NTP, IARC, EPA)
X	X	X	X	Asbestos	Known Human Carcinogen (NTP, IARC, EPA, ACGIH)
X	X	X	X	Benzene	Known Human Carcinogen (NTP, IARC, EPA)
X	X	X	X	Benzo(a)pyrene	Listed by International Joint Commission
X	X	X	X	Biphenyl	Air Toxicant, score = 10.75 Acute: 2400 mg/kg (1) Subacute: 1.5 mg/cu m (3) Systemic: Central and peripheral nerve damage, liver damage leading to acute yellow atrophy [severe effect on Cat. I organ = 9] @ 5 mg/cu m [1.08 mg/kg-day = 3] (6.75)

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14th Judicial District Court
Optima, Louisiana Parish, Louisiana
Chemical

1 2 3 4
X X X Boron trifluoride

Selection Basis
Air Toxicant, score = 11.00
Acute: 1180 mg/cu m (2)
Subacute: 3 mg/cu m (3)
Systemic: Pneumonitis [mild effect on Cat. I organ
= 6] @ 1.5 ppm [0.98 mg/kg-day = 4] (6.00)

X X X X 1,3-Butadiene

Probable Human Carcinogen (NTP)

X X X X n-Butyl alcohol

Air Toxicant, score = 6.50
Acute: 790 mg/kg (1)
Subacute: 150 mg/cu m (1)
Systemic: Decreased hearing acuity [mild effect
on Cat. I organ = 6] @ 80 ppm [7.5 mg/kg-day
= 3] (4.50)

X X X X Cadmium and compounds

Probable Human Carcinogen (NTP, IARC, EPA)

X X X X Caprolactam

Air Toxicant, score = 6.00
Acute: 300 mg/cu m (3)
Subacute: 1 mg-dust/cu m (3)
Systemic: none recognized (0.00)

X X X X Carbon disulfide

Air Toxicant, score = 10.00
Acute: 25000 mg/cu m (1)
Subacute: 30 mg/cu m (2)
Systemic: Significant vascular, nervous system,
and biochemical changes [definite effects
on Cat. I organs = 7] @ 9 ppm [0.87 mg/kg-day
= 4] (7.00)

X X X Carbon tetrachloride

Probable Human Carcinogen (NTP, IARC, EPA, ACGIH)

X X X Chlordane

Probable Human Carcinogen (EPA)

X X X X Chlorinated
dibenzodioxins

Listed by International Joint Commission

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Option				Chemical	Selection Basis
1	2	3	4		
X	X	X	X	Chlorinated dibenzofurans	Listed by International Joint Commission
X	X	X		Chloroform	Probable Human Carcinogen (NTP, IARC, EPA, ACGIH)
X	X	X	X	Chromium and compounds	Known Human Carcinogen (NTP, IARC, EPA)
X	X	X	X	Coal tar volatiles	Known Human Carcinogen (ACGIH)
X	X			Cobalt and compounds	Air Toxicant, score = 9.00 Acute: no data (0) Subacute: 0.05 mg/cu m (3) Systemic: Lung injury [mild effects on Cat. I organ = 6] @ 0.1 ppm [0.0036 mg/kg-day = 4] (6.00)
X				p-Cresidine	Probable Human Carcinogen (NTP, IARC)
deleted				Cumene hydroperoxide	Air Toxicant, score = 4.75 Acute: 1365 mg/cu m (2) Subacute: no data (1) Systemic: Pulmonary edema [definite effect on Cat. I organ = 7] @ 304 mg/kg [304 mg/kg-day = 1] (1.75)
X				Cyclohexanone	Air Toxicant, score = 6.25 Acute: 32111 mg/cu m (0) Subacute: 100 mg/cu m (1) Systemic: Degenerative liver and kidney changes [definite effects on Cat. I organs = 7] @ 190 ppm (4.4 mg/kg-day = 3] (5.25)
X				2,4-D	Air Toxicant, score = 7.75 Acute: 370 mg/kg (2) Subacute: 10 mg/cu m (2) Systemic: Kidney injury [minor effect on Cat. I organ = 5] @ 5 mg/kg-day [5 mg/kg-day = 3] (3.75)

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Ross v. Conoco, Inc., No. 90-4877
14th District Court, Denver, CO
Case No. 90-4877

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Ross v. Conoco, Inc., No. 90-4837
 14th Judicial District Court
 Calcasieu Parish, Louisiana

<u>Option</u>				<u>Chemical</u>	<u>Selection Basis</u>
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>		
X	X	X	X	DDT	Listed by International Joint Commission
X				4,4'-Diaminodiphenyl ether	Probable Human Carcinogen (NTP, IARC)
X	X			Dibutyl phthalate	Air Toxicant, score = 8.00 Acute: 8000 mg/kg (0) Subacute: 5 mg/cu m (2) Systemic: Polyneuritis [mild effect on Cat. I organ = 6] @ 1.7 mg/cu m [0.11 mg/kg-day = 4] (6.00)
X	X	X	X	p-Dichlorobenzene	Probable Human Carcinogen (NTP, EPA)
X	X	X	X	Dieldrin	Listed by International Joint Commission
X	X	X		Di(2-ethylhexyl) phthalate	Probable Human Carcinogen (NTP, IARC, EPA)
X				Dimethyl sulfate	Probable Human Carcinogen (NTP, IARC, EPA, ACGIH)
X				Dimethylamine	Air Toxicant, score = 6.50 Acute: 8371 mg/cu m (1) Subacute: 18 mg/cu m (2) Systemic: Liver damage [definite effect on Cat. I organ = 6] @ 97 ppm [12 mg/kg-day = 2] (3.00)
X	X	X		1,4-Dioxane	Probable Human Carcinogen (NTP, IARC, EPA)
X	X	X		Epichlorohydrin	Probable Human Carcinogen (NTP, IARC, EPA)
X	X			Ethyl acrylate	Air Toxicant, score = 6.00 Acute: 8925 mg/cu m (1) Subacute: 20 mg/cu m (2) Systemic: Drowsiness and headache [mild effects of Cat. I organs = 6] @ 50 ppm [27 mg/kg-day = 2] (3.00)

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Option				Chemical	Selection Basis
1	2	3	4		
X	X	X	X	Ethylene	Air Toxicant, score = 8.00 Acute: 1090270 mg/cu m (0) Subacute: not listed (1) Systemic: Cholinesterase inhibition [definite effect on Cat. I organ = 7] @ 3 mg/kg [0.24 mg/kg-day = 4] (7.00)
X	X	X	X	Ethylene dichloride	Probable Human Carcinogen (NTP, IARC, EPA)
X	X	X	X	Ethylene oxide	Probable Human Carcinogen (NTP, IARC, EPA, ACGIH)
X				Fluorine	Air Toxicant, score = 6.00 Acute: 144 mg/cu m (3) Subacute: 2 mg/cu m (3) Systemic: none recognized (0.00)
X	X	X	X	Formaldehyde	Probable Human Carcinogen (NTP, IARC, EPA, ACGIH)
X	X	X	X	Hexachlorobenzene	Listed by International Joint Commission
X	X	X		Hexachlorocyclopentadiene	Air Toxicant, score = 13.00 Acute: 15 mg/cu m (3) Subacute: 0.1 mg/cu m (3) Systemic: Degenerative changes of liver and kidneys [definite effects on Cat. I organs = 7] @ 0.15 ppm [0.11 - 0.16 mg/kg-day = 4] (7.00)
X	X	X		Hydrazine	Probable Human Carcinogen (NTP, IARC, EPA, ACGIH)
X	X	X	X	Hydrogen fluoride	Air Toxicant, score = 11.00 Acute: 1040 mg/cu m (2) Subacute: 2.5 mg/cu m (3) Systemic: Lung injury [mild effects on Cat. I organ = 6] @ 17 ppm [0.53 mg/kg-day = 4] (6.00)

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 14th Judicial District Court
 Calcasieu Parish, Louisiana

Option				Chemical	Selection Basis
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>		
X	X			Isobutyraldehyde	Air Toxicant, score = 6.50 Acute: 39500 mg/cu m (1) Subacute: not listed (1) Systemic: Hemogloinemia [mild effect on Cat. I organ = 6] @ 50 mg/kg [2.7 mg/kg-day = 3] (4.50)
X	X	X	X	Lead and compounds	Probable Human Carcinogen (NTP, EPA)
X	X	X	X	Maleic anhydride	Air Toxicant, score = 6.50 Acute: 400 mg/kg (2) Subacute: 1 mg/cu m (3) Systemic: Increased susceptibility to lung infection and bronchitis [mild effect on Cat. I organ = 6] @ undefined concentration [? mg/kg-day = 1] (1.50)
X	X	X	X	Mercury	Listed by International Joint Commission
X	X			Methyl methacrylate	Air Toxicant, score = 6.50 Acute: 15350 mg/cu m (1) Subacute: 410 mg/cu m (1) Systemic: CNS effects (decreased neuronal firing rate) [mild effect on Cat. I organ = 6] @ 400 ppm [2.3 mg/kg-day = 3] (4.50)
X	X	X		4,4'-Methylenebis (N,N'-dimethyl) benzeneamine	Probable Human Carcinogen (NTP)
X	X	X	X	Methylene chloride	Probable Human Carcinogen (NTP, EPA, ACGIH)
X				4,4'-Methylene dianiline	Probable Human Carcinogen (NTP)

CMA 01024B

Option
1 2 3 4

Chemical

Selection Basis

X X X X

Methylenebis(phenyl-
isocyanate) (MBI)

Air Toxicant, score = 6.00

Acute: 178 mg/cu m (3)

Subacute: not listed (1)

Systemic: Pulmonary fibrosis [major effect on Cat. I
organ = 8] @ undefined concentration
[? mg/kg-day = 1] (2.00)

X X X X

Mirex

Listed by International Joint Commission

X

Molybdenum trioxide

Air Toxicant, score = 7.75

Acute: 125 mg/kg (2)

Subacute: 5 mg/cu m (2)

Systemic: Pneumoconiosis [minor effect on Cat. I
organ = 5] @ 10 mg/m³ [1.3 mg/kg-day = 3]
(3.75)

X X X X

Nickel and compounds

Known Human Carcinogen (NTP, IARC, EPA, ACGIH)

X X X X

Nitric acid

Air Toxicant, score = 6.50

Acute: 170 mg/cu m (3)

Subacute: 5 mg/cu m (2)

Systemic: Increased susceptibility to pulmonary
infection [mild effect on Cat. I organ
= 6] @ undefined concentration [? mg/kg-day
= 1] (1.50)

X X X X

2-Nitrophenol

Air Toxicant, score = 9.00

Acute: 334 mg/kg (2)

Subacute: not listed (1)

Systemic: CNS effects (disruption of reflexes) [mild
effect of Cat. I organ = 6] @ 0.003 mg/kg-day
[0.003 mg/kg-day = 4] (6.00)

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Subject to Protective Order in
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14th Judicial District Court
Calcasieu Parish, Louisiana

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Subject to Protective Order in
Ross v. Conoco, Inc., No. 90-4837
 14th Judicial District Court
 Calcasieu Parish, Louisiana

<u>Option</u>				<u>Chemical</u>	<u>Selection Basis</u>
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>		
X	X			4-Nitrophenol	Air Toxicant, score = 9.00 Acute: 250 mg/kg (2) Subacute: not listed (1) Systemic: CNS effects (disruption of reflexes) [mild effects of Cat. I organ = 6] @ 0.00125 mg/kg-day [0.001 mg/kg-day = 4] (6.00)
X	X	X	X	2-Nitropropane	Probable Human Carcinogen (NTP, IARC)
X				Peracetic acid	Air Toxicant, score = 9.25 Acute: 450 mg/cu m (3) Subacute: not listed (1) Systemic: Chemical bronchopneumonia [definite effect on Cat. I organ = 7] @ 186 mg/cu m [3.2 mg/kg-day = 3] (5.25)
X	X	X	X	Phenol	Air Toxicant, score = 11.75 Acute: 316 mg/cu m (3) Subacute: 19 mg/cu m (2) Systemic: Severe damage to lung, heart, liver, and kidneys [severe effects on Cat. I organs = 9] @ 25 ppm [1.3 mg/kg-day = 3] (6.75)
X	X			Phosphorus	Air Toxicant, score = 9.00 Acute: 3.03 mg/kg (3) Subacute: 0.1 mg/cu m (3) Systemic: Bone changes [definite effects on Cat. III organs = 3] @ 0.05 mg/kg [0.05 mg/kg-day = 4] (3.00)
X	X	X	X	PCBs	Listed by International Joint Commission
X				Selenium and compounds	Air Toxicant, score = 8.00 Acute: 6700 mg/kg (0) Subacute: 0.2 mg/cu m (3) Systemic: CNS effects (socio-psychiatric disturbance) [minor effects of Cat. I organ = 5] @ 0.2 mg/cu m [0.02 mg/kg-day = 4] (5.00)

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Option				Chemical	Selection Basis
1	2	3	4		
X				Sodium fluoride	Air Toxicant, score = 8.00 Acute: 52 mg/kg (2) Subacute: 2.5 (for F) mg/cu m (3) Systemic: Bone injury (osteosclerosis) [definite effect on Cat. III organ = 3] @ 4 mg/cu m [0.26 mg/kg-day = 4] (3.00)
X	X	X	X	Sulfuric acid	Air Toxicant, score = 11.00 Acute: 510 mg/cu m (2) Subacute: 1 mg/cu m (3) Systemic: Slight pulmonary histopathology [mild effect on Cat. I organ = 6] @ 0.38 mg/cu m [0.061 mg/kg-day = 4] (6.00)
X	X	X	X	Tetrachloroethylene	Probable Human Carcinogen (NTP, EPA)
X	X	X	X	Toluene 2,4-diisocyanate (TDI)	Air Toxicant, score = 12.00 Acute: 95 mg/cu m (3) Subacute: 0.04 mg/cu m (3) Systemic: Sensitizer leading to respiratory difficulty [mild effect on Cat. I organ = 6] @ 0.01 ppm [0.0022 mg/kg-day = 4] (6.00)
X	X	X	X	Toxaphene	Listed by International Joint Commission
X	X	X	X	Trichloroethylene	Probable Human Carcinogen (EPA)
X	X	X	X	1,2,4-Trimethylbenzene	Air Toxicant, score = 6.50 Acute: 18000 mg/cu m (1) Subacute: 125 mg/cu m (1) Systemic: CNS (nervous anxiety) and respiratory difficulty [mild effect on Cat. I organ = 6] @ 10 - 60 ppm total hydrocarbons [1.5 mg/kg-day = 3] (4.50)

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Option				Chemical	Selection Basis
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>		
X	X			2,4,6-Trinitrotoluene	Air Toxicant, score = 10.00 Acute: 795 mg/kg (1) Subacute: 0.5 mg/kg (3) Systemic: Liver damage [mild effects on Cat. I organ = 6] @ 2.38 mg/cu m [0.15 mg/kg-day = 4] (6.00)
X	X	X	X	Vinyl chloride	Known Human Carcinogen (NTP, IARC, EPA, ACGIH)
X	X			Vinylidene chloride	Air Toxicant, score = 7.50 Acute: 25175 mg/cu m (1) Subacute: 20 mg/cu m (2) Systemic: Liver and kidney damage [mild effects on Cat. I organs = 6] @ 25 ppm [5.8 mg/kg-day = 3] (4.50)

LDN/A/014

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 14th Judicial District Court
 Calcasieu Parish, Louisiana

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References

<u>Chemical</u>	<u>Reference</u>
Acrylic acid	Miller, R. R.; Fund Appl Toxicol 1:271-277 (1981)
Aniline	Oberst, F. W.; Arch Ind Health 13:379 (1956)
Biphenyl	Hakkinen, I., S. Hernberg, P. Karli, and E. Vikkula; "Diphenyl Poisoning in Fruit Paper Production", Arch Environ Health 26:70-74 (1973)
Boron trifluoride	Torkelson, T. R., S. E. Sadek, V. K. Rowe; "The Toxicity of Boron Trifluoride when Inhaled by Laboratory Animals", Am Ind Hyg Assoc J 22:263-270 (1961)
n-Butanol	Seitz, B.; Soc Med Hyg du Travail (April 10, 1972) Velasquez, J.; Med del Trabajo 1:43 (1964)
Carbon disulfide	Mihail, J.; Arch Mal Prof 29:109 (1968)
Cobalt	Kerfoot, E. J., W. G. Fredrick, and E. Domeier; "Cobalt Metal Inhalation Studies on Miniature Swine", Am Ind Hyg Assoc J 36:17-25 (1975)
Cyclohexanone	Treon, J. F.; J Ind Hyg Tox 25:323 (1943)
2,4-D	Hazleton Laboratories, 1983 Document Accession Number 251473, U.S. EPA, Office of Pesticide Programs, Washington, D.C.
Dibutyl phthalate	Milkov, L. E., <u>et al</u> , "Health Status of Workers Exposed to Phthalate Plasticizers in the Manufacture of Artificial Leather and Films Based on PVC Resins", Env Health Persp pages 175-178 (January, 1973)
Dimethylamine	Dow Chemical Co., unpublished report (1964)

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Ross v. Conoco, Inc., No. 90-4577
14th Judicial District Court
Calcasieu Parish, Louisiana

Chemical

Reference

Ethyl acrylate	Nemec, J. W., W. Bauer, Jr.; <u>Kirk-Othmer Encycl Chem Tech</u> , 3rd ed. Vol 1 pages 330-354, John Wiley and Sons, N.Y. (1978)
Ethylene	Krasovitskaya, M. L., L. Malyarova; <u>Gig Sanit</u> 33(5), 7 (1968)
Hexachlorocyclopentadiene	Treon, J. F.; <u>Arch Env Hlth</u> 11:459 (1955)
Hydrogen fluoride	Largent, E. J.; <u>Fluorosis</u> , Ohio State University Press, Columbus, OH (1961)
Isobutyraldehyde	Svintukhovskii, O. A.; "Toxicological Characteristics of iso Butyraldehyde", <u>Toksikol Gig Prod Neftekhim Neftekhim Proizvod</u> 187 (1972)
Maleic anhydride	Tanaka, S.; <u>J Sci Labor</u> page 117, Japan (February 1976)
Methyl methacrylate	Innes, D. L.; <u>Neurotoxicol</u> 2(3):515-522 (1981)
Methylenebis(phenylisocyanate)	<u>Ann Occup Hyg</u> , 21(2):121 (1978)
Molybdenum trioxide	Mogilevskaya, O. Ya. (1963) In: <u>Toxicology of Rare Metals</u> , pages 12-27. Izrael'son, Z. I. (Ed.) Gosudarstvennoe izdatel'stvo Meditsinskoi Literatury, Moscow (Translated by Israely Program for Scientific Translation, Jerusalem, 1967)
Nitric acid	Fairhall, L. T.; <u>Industrial Toxicology</u> 2nd ed., Williams and Wilkins, Baltimore, MD (1957) Treiger, P.; "Nitric Acid Fume Pneumonia", <u>Ind Med</u> 16:395 (1947)
2-Nitrophenol	Makhinya (1969) abstract only
4-Nitrophenol	Ibid
Peracetic acid	Heinze, W.; "Peracetic Acid Aerosol Effect in Long-term Use of Germicidal Concentrations on Experimental Animals", <u>Wiss, Z., Humbolt - Univ. Berlin, Math - Naturwiss Reihe</u> 33(5):513-517 (1984)

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14th Judicial District Court
Calcasieu Parish, Louisiana

<u>Chemical</u>	<u>Reference</u>
Phenol	Deichmann, W. B.; Am J Clin Path 14:273 (1944)
Phosphorus	Fleming, R. B. L.; J Ind Hyg Tox 24:154 (1942)
Selenium	Glover, J. R., B. Chir; "Selenium and its Industrial Toxicology", Ind Med 39:50 (1970)
Sodium fluoride	Williams, C. R.; J Ind Hyg Tox 24:277 (1942)
Sulfuric acid	Alarie, Y., W. M. Busey, A. A. Krumm, C. E. Ulrich; "Long-term Continuous Exposure to Sulfuric Acid Mist in Cynomolgus Monkeys and Guinea Pigs", Arch Environ Health 27:16-24 (1973)
Toluene 2,4-diisocyanate	Elkins, H. B., G. W. McCarl, H. G. Brugsch, J. P. Fahy; "Massachusetts Experience with Toluene Di-isocyanate", Am Ind Hyg Assoc J 23:265-272 (1962)
1,2,4-Trimethylbenzene	Battig, K.; Z Prav Med 1:389 (1957)
2,4,6-Trinitrotoluene	Goodwin, J. W.; "Twenty Years Handling TNT in a Shell Loading Plant", Am Ind Hyg Assoc J 33:41-44 (1972)
Vinylidene chloride	<u>Patty's Industrial Hygiene and Toxicology</u> 3rd ed. Vol. 2B pages 3545-3550, Wiley and Sons N.Y., N.Y. (1981)
LDM/A/020/psf	

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 Calcasieu Parish, Louisiana

Systemic Toxicity Score - Severity of Effects Scoring
Distribution of Toxicity Endpoints

Score:	1	2	3	4	5	6	7	8	9
	subjective symptoms	- lesions of nasal mucosa - flu symptoms - dilation of blood vessels	- bladder stones - skin abnormalities - osteoporosis - reduced growth - osteosclerosis - minor blood changes	blood alteration	- decreased RBC - headache/nausea/dizziness - fatty degeneration of liver - loss of concentration - Cat. I organ injury - hepatic porphoria - pneumoconiosis - Cat. I organ dysfunction - increased Cat. I organ weight - decreased uptake of norepinephrine - dyspnea - exaggerated lung markings - Cat. I organ congestion - ulcers	- narcotic effect - histology of liver - euphoria - susceptible to pulmonary infection - depression - hearing loss - asthmatic bronchitis - histology of lung - hepatomegaly - anemia - disruption of reflexes - hemoglobinemia - decreased pulmonary compliance - Cat. I organ degeneration - polyneuritis - pneumonitis - EKG changes - jaundice - nephritis	- decreased cholinesterase - hepatocellular vacuolization - significant biochemical changes - pulmonary edema - histology of brain - decreased birth weight with maternal effects - asthmatic sensitization - methemoglobinemia - kidney tubular damage - bronchopneumonia - hepatitis - fetal organ weight change - focal emphysema - polyneuropathy - chromosome aberration - decreased sperm production	- bone marrow suppression - Cat. I organ necrosis - pulmonary fibrosis - CNS deterioration - reversible teratogenesis - reproductive effects - neuro-psychiatric effects - fetal toxicity - convulsions - sterility - emphysema	- damage to multiple organs - hepatic atrophy - respiratory paralysis

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Note: Reversible effects can lower score. Multiple organ effects can raise score.

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CHEMICAL MANUFACTURERS ASSOCIATION

August 9, 1989

Dear Vinyl Chloride Panel Members:

The California Air Resources Board (ARB) has identified vinyl chloride as a toxic air contaminant. For their process of identification and regulation of toxic air contaminants, they have produced a draft report of findings. We have received a copy of the preliminary draft report for vinyl chloride. Public review of this report includes two comment periods. The first comment period began on August 1, 1989 with the mailing of the draft report. Written comments are to be submitted to the California ARB by September 8, 1989.

Comments received by the California ARB will be reviewed, compiled in Part C of the report, and where appropriate, the report will be revised. This revised report will be mailed to the public for a second and final review. A 20 day comment period will be given for this review.

If the Panel wants to provide comments, they may contact the California ARB at 916/323-8543 for a copy of the Technical Support Document for Proposed Identification of Vinyl Chloride as a Toxic Air Contaminant.

I will be contacting the Research Coordinators to schedule a conference call to discuss the retrieval of histopathological materials by the member companies for review of misdiagnosed angiosarcoms by Dr. Kamal Ishak of the Armed Forces Institute of Pathology.

Sincerely,

Susan R. Howe
Manager
Vinyl Chloride Panel

CONFIDENTIAL

Subject to Protective Order in
Ross v. Conoco, Inc., No. 90-4837
14th Judicial District Court
Calcasieu Parish, Louisiana

CMA 010257