

CONFERENCE to REEVALUATE the
TOXICITY of..... VINYL CHLORIDE,
POLYVINYL CHLORIDE
and STRUCTURAL ANALOGUES

March 20 - 21, 1980

NATIONAL INSTITUTES of HEALTH
MASUR AUDITORIUM
BUILDING 10
CLINICAL CENTER
BETHESDA, MARYLAND

Cosponsors:

National Institutes of Environmental Health Sciences
National Institute for Occupational Safety and Health
Occupational Safety and Health Administration

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VINYL CHLORIDE, POLYVINYL CHLORIDE AND
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National Institutes of Health
Masur Auditorium
Building 10
Clinical Center
Bethesda, Maryland

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National Institutes of Environmental Health Sciences
National Institute for Occupational Safety and Health
Occupational Safety and Health Administration

Thursday, March 20, 1980

8:00 A.M. REGISTRATION

8:30 A.M. INTRODUCTORY REMARKS
Dr. David Rall, NIEHS

SESSION I — CARCINOGENESIS BIOASSAYS OF VINYL CHLORIDE MONOMER

Chairperson: Dr. Umberto Safflotti, NCI

8:45 A.M. 1. Carcinogenicity Bioassays of Vinyl Chloride Monomer: A Model of Risk Assessment on Experimental Basis
Dr. Cesare Maltoni, Institute of Oncology and Tumor Center, Bologna

9:45 A.M. 2. Experimentally Induced Pulmonary Cancer
Dr. Y. Suzuki, Mt. Sinai Medical School

10:00 A.M. Discussion

10:15 A.M. Break

10:45 A.M. 3. The Role of Aging on Cancer Induced by Vinyl Chloride Monomer
Dr. David Groth, NIOSH

11:00 A.M. 4. Carcinogenic Effects of Exposure to Vinyl Chloride Monomer and Ethyl Alcohol on Rats
Dr. Martha Radtke, University of Cincinnati

11:15 A.M. 5. Cancer Induction Following Single and Multiple Exposures to a Constant Amount of Vinyl Chloride Monomer
Dr. Robert Hehl, CPSC

SESSION II — TOXICOLOGY STUDIES OF POLYVINYL CHLORIDE

Chairperson: Dr. Peter Infante, OSHA

11:30 A.M. 6. Pneumoconiosis in Animals Exposed to Polyvinyl Chloride Dust
Dr. David Groth, NIOSH

11:45 A.M. 7. Results of Carcinogenesis Bioassay of Polyvinyl Chloride
Dr. Chris Wagner, BMRC, Penarth, Wales

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SESSION III — SPUTUM CYTOLOGY OF VINYL CHLORIDE WORKERS

Chairperson: Dr. Peter Infante, OSHA

12:00 P.M. 8. Results of Sputum Cytology Among Workers Exposed to Vinyl Chloride Monomer and to Polyvinyl Chloride
Dr. Cesare Maltoni, Institute of Oncology and Tumor Center, Bologna

12:15 P.M. Discussion

12:30 P.M. LUNCH

SESSION IV — MORTALITY STUDIES OF WORKERS EXPOSED TO VINYL CHLORIDE

Chairperson: Dr. Philip Landrigan, NIOSH

2:00 P.M. 9. Multiple Site Risk Analysis of Vinyl Chloride Related Cancer in Workers — Review
Dr. Peter Infante, OSHA

2:15 P.M. 10. Cohort Mortality Study of Vinyl Chloride Workers
Dr. H. Weber, Der Staatliche Gewerbearzt Fed. Republic Germany

2:30 P.M. 11. Epidemiological Study of Vinyl Chloride Workers
Dr. Clark Cooper, Consultant

2:45 P.M. 12. Power Considerations in Epidemiologic Studies of Vinyl Chloride Workers
Dr. Jay Beaumont, NIOSH

3:00 P.M. Discussion

3:15 P.M. Break

SESSION V — LIVER AND BIOCHEMICAL CHANGES ASSOCIATED WITH VINYL CHLORIDE

Chairperson: Dr. David Groth, NIOSH

3:45 P.M. 13. Epidemiologic Review of Hepatic Angiosarcoma in the United States
Dr. Henry Falk, CDC

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- 4:00 P.M. 14. United Kingdom Angiosarcoma Registry
Dr. Peter Baxter, CDC
- 4:15 P.M. 15. Pathology of Vinyl Chloride Induced Liver Lesions
Dr. Hans Popper, Mt. Sinai Medical School
- 4:30 P.M. 16. Liver Screening Tests for Vinyl Chloride Exposed
Workers
Dr. Carlo Tamburro, University of Louisville

**SESSION VI — INDUSTRIAL HYGIENE MEASUREMENTS OF
POLYVINYL CHLORIDE OPERATIONS**

Chairperson: Mr. James Gideon, NIOSH

- 4:45 P.M. 17. Polyvinyl Chloride Processes and Products
Dr. R. Nick Wheeler, Union Carbide
- 5:00 P.M. 18. Characterization of Polyvinyl Chloride Homopolymers,
Copolymers and Additives
Mr. Jay Jones, NIOSH
- 5:15 P.M. Discussion

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**SESSION VII — MORBIDITY AND MORTALITY STUDIES OF
WORKERS EXPOSED TO POLYVINYL CHLORIDE**

Chairperson: Dr. R. Greenberg, University of Louisville

- 8:30 A.M. 19. Mortality Among Polyvinyl Chloride Fabricators
Dr. Leonard Chiazze, Georgetown University
- 8:45 A.M. 20. Heart Disease in the Swedish Polyvinyl Chloride
Fabricating Industry
Dr. Gustavo Molina, Colombia
- 9:00 A.M. 21. An Epidemiological Study of Respiratory Disease
in United Kingdom Workers Exposed to Polyvinyl
Chloride Dust
Dr. Anthony Seaton, University of Edinburgh
- 9:15 A.M. 22. Pneumoconiosis Induced by Polyvinyl Chloride Dust
Dr. A. Arnaud, Marseille, France

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- 9:30 A.M. 23. An Epidemiologic Study of Pneumoconiosis in the
Italian Polyvinyl Chloride Industry
Dr. Giuseppe Mastrangelo, Padova, Italy
- 9:45 A.M. 24. A Case-Control Study of Lung Cancer Among Vinyl
Chloride-Polyvinyl Chloride Workers
Dr. Richard Waxweiler, NIOSH
- 10:00 A.M. 25. Review of Pulmonary Effects of Polyvinyl Chloride
Exposure
Dr. Ruth Lillis, Mt. Sinai Medical School

10:15 A.M. Discussion

10:30 A.M. Break

SESSION VIII — REPRODUCTIVE EFFECTS OF VINYL CHLORIDE

Chairperson: Dr. James Wilson, University of Cincinnati

- 11:00 A.M. 26. Transplacental Teratogenic Effects of Vinyl Chloride
in Experimental Animals
Dr. Jackie John, Dow Midland
- 11:15 A.M. 27. Transplacental Carcinogenic Effects
Dr. Jerry Rice, NCI
- 11:30 A.M. 28. Mutagenic Effects of Vinyl Chloride
Dr. Jill Fabricant, University of Texas, Galveston
- 11:45 A.M. 29. Power Considerations in Studies of Reproductive
Effects Associated with Vinyl Chloride and Some
Structural Analogues
Ms. Maureen Hatch, Columbia University

12:00 P.M. Discussion

12:30 P.M. LUNCH

**SESSION IX — ENVIRONMENTAL EXPOSURE TO VINYL CHLORIDE-
POLYVINYL CHLORIDE AND LIVER
ANGIOSARCOMA**

Chairperson: Dr. Pier Bertazzi, Institute of Occupational
Health, Milan

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- 2:00 P.M. 30. Fugitive Emissions of Vinyl Chloride-Polyvinyl Chloride
Dr. Susan R. Wyatt, EPA
- 2:15 P.M. 31. Case-Control Study of Liver Angiosarcoma Among Residents in New York
Dr. Nicholas Vlahos, N.Y.S. Department of Health

SESSION X - CARCINOGENICITY OF SOME STRUCTURAL ANALOGUES OF VINYL CHLORIDE

Chairperson: Dr. Kim Hooper, University of California, Berkeley

- 2:30 P.M. 32. Comparative Pathology of Vinyl Chloride and Vinyl Bromide Induced Liver Pathology in Animals
Dr. William Busey, Experimental Pathology Laboratories
- 2:45 P.M. 33. Review of Experimental Carcinogenesis of Vinyl Chloride Related Compounds
Dr. Ken Chu, NCI
- 3:00 P.M. 34. Review of Epidemiologic Study Results of Vinyl Chloride Related Compounds
Ms. Rosanne Apfeldorf, OSHA

3:15 P.M. Discussion

3:30 P.M. Break

SESSION XI - RESEARCH NEEDS AND PUBLIC HEALTH INTERVENTION

Chairperson: Dr. Anthony Robbins, NIOSH

Panel Discussion

- 4:00 P.M. 35. Dr. Dale Haddis, Center for Policy Alternatives, MIT
- 4:15 P.M. 36. Mr. Steve Wodke, OCAW
- 4:30 P.M. 37. Dr. Maurice Johnson, B.F. Goodrich
- 4:45 P.M. 38. Dr. Irving Selikoff, Mt. Sinai Medical School

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5:00 P.M. 39. Dr. Joseph Wagoner, EDF

5:15 P.M. Discussion

Proceedings from the Conference will be published

Program Planning Committee

Dr. Richard B. Everson
NIEHS, Research Triangle Park, North Carolina

Dr. Peter F. Infante
OSHA, Washington, D.C.

Dr. Phillip J. Landrigan
NIOSH, Cincinnati, Ohio

Dr. Raymond E. Shapiro
NIEHS, Research Triangle Park, North Carolina

Dr. Richard J. Waxweiler
NIOSH, Cincinnati, Ohio

LIST OF ATTENDEES AT
VC CONFERENCE (including participants)

<u>Name</u>	<u>Affiliation</u>
1. Abramowitz, B.J.	Hooker Chemicals and Plastics
2. Adams, W.G.F.	I.C.I.
3. Adamson, Richard H., Dr.	Office of Science and Technology Policy
4. Alarik, Lang M.	N.I.H.
5. Anand, Vir D.	Food and Drug Administration
6. Anderson, Larry D.	E.P.A.
7. Apfeldorf, Rosanne	O.S.H.A.
8. Arnaud, A., Dr.	Clinique de Pneumo- physiologie, France
9. Baier, E.J.	Diamond Shamrock Corp.
10. Ballou, L.H.	Firestone
11. Barancik, J.I., Dr.	Case Western Reserve University
12. Barr, John T.	Air Products
13. Baxter, Peter, Dr.	C.D.C.
14. Baumslag, N., Dr.	H.E.W.
15. Beatty, Patrick	Shell Development Co.
16. Beaumont, Jay	N.I.O.S.H.
17. Bertazzi, Pier, Dr.	Occupational Health Studies Group
18. Bierbower, George W., Dr.	C.P.S.C.
19. Benya, Ted	Ethyl Corporation
20. Bell, Zeb G., Sc.D.	P.P.G. Industries
21. Berger, Jerry	Shell Oil Company

<u>Name</u>	<u>Affiliation</u>
22. Berger, Paul	E.P.A.
23. Bodamer, James W.	T.R.W. Environmental Engineering Co.
24. Breen, Catherine	Mannington Mills
25. Brody, Judith	New York State Health Department
26. Bunn, William	Duke University
27. Busey, William, Dr.	Experimental Pathology Laboratories
28. Carroll, William F.	Firestone Plastics Co.
29. Cassidy, John J.	Firestone Company
30. Chen, C.T., Dr.	O.S.H.A.
31. Chi, Ken	Reliance Insurance Co.
32. Chiazze, Leonard, Dr.	Georgetown University
33. Chu, Ken	N.C.I.
34. Cohen, Frances H.	Maryland Occupational Safety and Health
35. Cooper, Clark, Dr.	Consultant
36. Coppola, Joseph C.	Pantasote, Inc.
37. Corcoran, Larry	E.D.F.
38. Cosmides, George J., Dr.	N.I.H.
39. Cotten, O. Paul	Great American Cleaning Corp.
40. Crisorio, L.A.	Union Carbide Corp.
41. Daigre, G.W.	Dow Chemical Company
42. Dedrick, R.L.	N.I.H.
43. Diaz, Filadelfo T.	Firestone Tire and Rubber Co.
44. Dimmick, W. Fred	E.P.A.

<u>Name</u>	<u>Affiliation</u>
45. Downs, Tom	University of Texas
46. Dunnigan, Paula C., Dr.	B.F. Goodrich Co.
47. Ertel, J.E.	Pantasote, Inc.
48. Everson, Richard	N.I.E.H.S.
49. Falk, Henry, Dr.	C.D.C.
50. Fabricant, Jill, Dr.	University of Texas
51. Farrar, Grover L.	American Hoechst Corp.
52. Fishbein, Leon, Dr.	Borden Chemical Co.
53. Flake, Raymond E., M.D.	Dow Chemical Co.
54. Flint, George S.	Tenneco Chemicals
55. Ford, Gary L.	Stauffer Chemical Co.
56. Fountos, Barrett N.	O.S.H.A.
57. France, Laureen	U.S. Brewer Association
58. French, John E., Dr.	F.D.A.
59. Froemming, Neil	BNA Publications
60. Fukushi, Nobuo	Nippon Zeon of America, Inc.
61. Gabbett, James F.	Georgia Pacific
62. Gaudette, Leo E., Dr.	T.O.M.A./P.A.
63. Gideon, James	N.I.O.S.H.
64. Goralski, Debra	Mobil Chemical Co.
65. Gherghel, Radu	Allied Chemical Corp.
66. Gottesman, Roy T., Dr.	Tenneco Chemical Co.
67. Gosztonyi, R.E., Fr.M.D.	Tenneco Chemical Co.
68. Gough, Robert G.	Cincinnati Milicron
69. Greenberg, Richard A., Dr.	University of Louisville
70. Group, Edward D., Dr.	Exxon Chemical Co.

<u>Name</u>	<u>Affiliation</u>
71. Groth, David, Dr.	N.I.O.S.H.
72. Hadley, Joseph E.	Keller and Heckman
73. Hall, James J.	Conoco Chemical Co.
74. Hamilton, L. Leslie	Health Industry Manufacturers Asso.
75. Hardy, Helen T.	Navy Environmental Health Center
76. Haring, Marie	N.I.O.S.H.
77. Harmison, Lowell T., Dr.	Public Health Service
78. Harper, Philip J.	N.Y.S. Health Department
79. Harris, Walter D.	Uniroyal, Inc.
80. Hatch, Maureen	Columbia University
81. Hattis, Dale	M.I.T.
82. Hegyeli, Andrew F.	N.C.I.
83. Hehir, Robert M., Dr.	C.P.S.C.
84. Henry, Timothy, Dr.	F.D.A.
85. Hinderer, Robert K.	B.F. Goodrich Co.
86. Hook, A.W.	Anaconda Aluminum
87. Hooper, Kim	University of California
88. Hooper, Carl R.	Gulf Science and Technology Co.
89. Hunter, D.H.	Tenneco Chemical Co.
90. Hurley, J. Fenton	Institute of Occupational Medicine, Edinburgh
91. Infante, Peter F., Dr.	O.S.H.A.
92. John, Jaqueline A.	Dow Chemical Co.
93. Johnson, Clifford A.	Goodyear Tire and Rubber Co.
94. Johnson, Maurice	B.F. Goodrich Co.

<u>Name</u>	<u>Affiliation</u>
95. Jones, Jay	N.I.O.S.H.
96. Jones, M. Bruce	Mannington Mills
97. Kennedy, Harriett	N.C.I.
98. Kilquor, Robert	Armstrong Cork Co.
99. Kokon, Jack	I.C.I. Americas
100. Kordalski, John S.	Veterans Administration
101. Knarr, Richard	Stauffer Chemical
102. Landrigan, Philip, Dr.	N.I.O.S.H.
103. LaRose, George E.	Whittaker, Corp.
104. Laundrie, Robert W.	General Tire
105. Lawrence, John R.	Society of Plastics Industry
106. Leineweber, J.P.	Johns-Manville Corp.
107. Lillis, Ruth	Mt. Sinai School of Medicine
108. Lin, Chin, Dr.	F.D.A.
109. Lloyd, J. William, Dr.	O.S.H.A.
110. Lynch, Jeremiah	Exxon Chemical Co.
111. Maltoni, Caesar, Dr.	Instituto Di Oncologia, Bologna
112. Marcer, Guido	Instituto Di Medicina Del Cavordo
113. Marcus, William L.	E.P.A.
114. Maroney, W.P.	Ball Corp.
115. Marrack, David	Fort Bend Medical Division
116. Mastrangelo, Guiseppe	University of Padova
117. McClendou, Janet S.	Jacob-Medinger Co.
118. McElheny, Victor K.	Cold Spring Harbor Labs.

<u>Name</u>	<u>Affiliation</u>
119. McGaughy, Robert E.	E.P.A.
120. McNamara, B.P.	U.S. Army
121. Mekarg, Toshio	Borden, Inc.
122. Miller, Richard A.	PVC Belting Co.
123. Misra, Krishna P., Dr.	F.D.A.
124. Molina, Gustavo	Servicio Seccional Salud Medillian, Colombia
125. Montgomery, Kristie L.	General Motors Co.
126. Morris, Linda E.	N.C.I.
127. Mubeijie, Debdas, Dr.	Environmental Control Co.
128. Nelson, K.W.	ASARCO
129. Nesbitt, Jeffrey	Anaconda Co.
130. Norris, J.M.	Dow Chemical Co.
131. Olson, William A.	C.F.R. Servicio
132. Oubre, Robert R.	Dow Chemical Co.
133. Omenin, Gilbert S., Dr.	Executive Office of the President
134. Palshaw, Mary W.	Stauffer Chemical Co.
135. Park, Russell A.	Firestone Plastics Co.
136. Patterson, Alexander	W.R. Grace and Co.
137. Pegg, David G.	General Motors Corp.
138. Perkowski, Regina F.	General Food Corp.
139. Popper, Hans, Dr.	Mt. Sinai Medical School
140. Posner, Herbert S., Dr.	N.I.E.H.S.
141. Potyondy, Istavn	Dow Chemical Co.
142. Potyondy, Martha	Shintell, Inc.
143. Radike, Martha	University of Cincinnati

<u>Name</u>	<u>Affiliation</u>
144. Rall, David, Dr.	N.I.E.H.S.
145. Ramsey, Michael D.	Liberty Mutual Insuranc
146. Rauts, Rebecca	Chemical and Engineering News
147. Renzo, Mattuissi	Occupational Health of Montedison
148. Rhoads, Russell H.	American Haescht Film
149. Rice, Jerry, Dr.	N.C.I.
150. Ringwood, Robert C.	M. & T. Chemicals, Inc.
151. Roggi, P.E.	Stauffer Chemical Co.
152. Rosensing, William	V.A.H.
153. Rosnick, Andrea	Hill and Knowlton Co.
154. Rupp, William	Tenneco Chemicals, Inc.
155. Ryerson, David W.	I.C.I. Americas
156. Robbins, Anthony, Dr.	N.I.O.S.H.
157. Saffiotti, Umberto, Dr.	N.C.I.
158. Saia, Bruno	Institute of Occupational Health - Italy
159. Sauerhoff, M.W.	Stauffer Chemical Co.
160. Sarokhan, Brenda	American Cancer Society
161. Scott, Kathryn	Bureau of National Affairs
162. Seaton, Anthony, Dr.	Institute of Occupational Medicine - Edinburgh
163. Selikoff, Irving, Dr.	Mt. Sinai School of Medicine
164. Shah, Hasmukh	Chemical Manufacturers Association
165. Shapiro, Raymond, Dr.	N.I.E.H.S.

<u>Name</u>	<u>Affiliation</u>
166. Shepler, Thomas	General Tire and Rubber
167. Skalsky, Harry	Reynolds Metals Co.
168. Skory, Lyman	Dow Chemical Co.
169. Soffritti, Morando	N.I.E.H.S.
170. Sorenson, W.R.	Tenneco Chemicals, Inc.
171. Stafford, John	Imperial Chemical Industries, LTD.
172. Staura, J.F.	E.P.A.
173. Sun, Hee-Sik	N.I.A.M.D.D.
174. Suzuki, Y., Dr.	Mt. Sinai School of Medicine
175. Swetonic, Matthew M.	Hill and Knowlton, Inc.
176. Tamburro, Carlo H.	University of Louisville
177. Tanaka, Hozumi	Kaneka America Corp.
178. Tassignon	Solvay, Belgium
179. Thomas, Jean C.	Rhone Poulenc, France
180. Thomka, L.M.	Dow Chemical Co.
181. Torkelson, T.R.	Dow Chemical Co.
182. Tsonges, Theordora A., Dr.	E.P.A.
183. Westendorf, Bill	Monsanto Co.
184. Wharton, F.D.	Continental Group, Inc.
185. White, Faye	Government Research Corp.
186. White, George F., Jr.	Reynolds Metals Co.
187. Vainio, Harri	Institute of Occupational Health, Finland
188. Vianna, Nicholas, Dr.	N.Y. State Health Dept.
189. Wagoner, Joseph K., Dr.	E.D.F.

<u>Name</u>	<u>Affiliation</u>
190. Wheeler, R.N.	Union Carbide Corp.
191. White, Lowell, D.	ASARCO, Inc.
192. Yodeiken, Ralph	N.I.O.S.H.
193. Young, Ronald	O.S.H.A.
194. Zavon, Mitchell R.	Hooker Chemical Co.
195. Zimmerman, Jack E.	Diamond Shamrock Co.
196. Zuk, Irena	Interdevelopment, Inc.