

JOINT

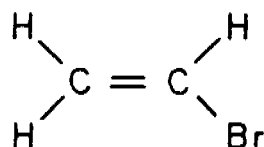
NIOSH / OSHA

Current Intelligence Bulletin 28

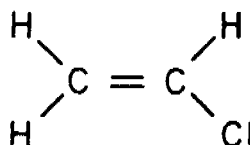
September 21, 1978

VINYL HALIDES CARCINOGENICITY

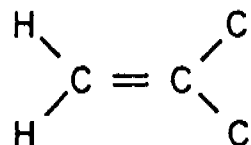
Vinyl Bromide



Vinyl Chloride



Vinylidene Chloride



U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Center for Disease Control
National Institute for Occupational Safety and Health

U. S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

UCC 107234

Mutagenicity and Reproductive Effects

Cytogenetic studies have demonstrated a significant increase in the frequency of chromosomal aberrations in the lymphocytes of workers exposed to vinyl chloride (25-31). Further evidence for the mutagenicity of vinyl chloride has been provided by investigations showing an increase in fetal wastage among wives of male workers following occupational exposure to vinyl chloride (32,33). No studies addressing mutagenic or reproductive hazards among vinyl bromide or vinylidene chloride exposed populations have been reported.

Other Adverse Effects

Numerous other adverse health effects have been observed in humans exposed to vinyl chloride, as detailed in Table 2. Reports of effects on workers exposed to vinylidene chloride in combination with other vinyl compounds include liver function abnormalities, headache, vision problems, dizziness, fatigue, weakness, and neurological sensory disturbances. No similar reports for vinyl bromide exposure were found (1).

Table 2. Other Adverse Effects of Vinyl Chloride on Humans (1).

System	Adverse Effect
neurologic	dizziness, lightheadedness, dulling vision and hearing, drowsiness, headache, loss of memory, euphoria, nervousness, numbness or tingling in fingers or toes
gastrointestinal	nausea, loss of appetite, abdominal distress, varices of esophagus or stomach, black stools, bloody vomitus
cardiovascular	increased blood pressure, Raynaud's Syndrome
hepatic	liver enlargement, liver function abnormalities, increased sulphobromophthalein retention, liver damage, serum enzyme abnormalities
respiratory	coughing and sneezing, bronchial rales, emphysema, pulmonary fibrosis, decreased respiratory function, lung function disturbances
hematologic	anemia, reticulocytosis, leukopenia, thrombocytopenia, splenomegaly
dermatologic	contact dermatitis, scleroderma-like skin changes
musculoskeletal	calf and joint pain, acroosteolysis
other	increased perspiration, cold sensation in fingers and hands, fatigue, weight loss, weakness, impotency

24. Ott, M.G., W.A. Fishbeck, J.C. Townsend, E.J. Schneider: A Health Study of Employees Exposed to Vinylidene Chloride. J. Occup. Med. 18:735-738 (1976).
25. Leonard A., G. Decat, E.D. Leonard, M.J. Lefevre, L.J. Decuyper, C. Nicaise: Cytogenetic Investigations on Lymphocytes from Workers Exposed to Vinyl Chloride. J. Toxicol. Environ. Health. 2:1135-1141 (1977).
26. Heath, C.W. Jr., C.R. Dumont, J. Gamble, R.J. Waxweiler: Chromosomal Damage in Men Occupationally Exposed to Vinyl Chloride Monomer and Other Chemicals. Environ. Res. 14:68-72 (1977).
27. Ducatman, A., K. Hirschhorn, I.J. Selikoff: Vinyl Chloride Exposure and Human Chromosome Aberrations. Mutat. Res. 31:163-168 (1975).
28. Funes-Cravioto, F.B. Lambert, J. Lindsten, L. Ehrenberg, A.T. Natarajan, and S. Osterman-Golkar: Chromosome Aberrations in Workers Exposed to Vinyl Chloride. Lancet 1:459 (1975).
29. Purchase, I.F.H., C.R. Richardson, and D. Anderson: Chromosomal and Dominant Lethal Effects of Vinyl Chloride. Lancet 2:410-11 (1975).
30. Szentesi, I., E. Hornyaki, G. Ungvary, A. Gzeizel, Z. Bogнар, and M. Timar: High Rate of Chromosomal Aberration in PVC Workers. Mutat. Res. 37:313-316 (1976).
31. Purchase, I.F.H., C.R. Richardson, D. Anderson, G.M. Paddle, and W.G.F. Adams: Chromosomal Analyses in Vinyl Chloride-Exposed Workers. Mutat. Res. 57: 325-334 (1978).
32. Infante, P.F., J.K. Wagoner, A.J. McMichael, R.J. Waxweiler, and H. Falk: Genetic Risks of Vinyl Chloride. Lancet 1:734-735 (1976).
33. Infante, P.F., J.K. Wagoner, and R.J. Waxweiler: Carcinogenic, Mutagenic and Teratogenic Risks Associated with Vinyl Chloride. Mutat. Res. 41:131-142 (1976).
34. Personal Communications dated August 1978 from Mr. David P. Sundin, Division of Surveillance, Hazard Evaluations and Field Studies, National Institute for Occupational Safety and Health (NIOSH), to Leonard J. Bahlman, Office of Extramural Coordination and Special Projects (NIOSH).
35. United States Department of Labor, Occupational Safety and Health Administration: General Industry Standards, OSHA Publication 2206, 29 CFR 1910.1017 (January 1976).