

## Preface

Under the Occupational Safety and Health Act of 1970, NIOSH and OSHA are responsible for ensuring, insofar as possible, that every working man and woman is provided with a safe and healthful working environment.

In 1974, NIOSH and OSHA jointly began to develop a series of complete occupational health standards for substances with existing permissible exposure limits. This project, the Standards Completion Program (SCP), involved several contractors and personnel from NIOSH and OSHA. The resulting substance-specific draft technical standards, with supporting documentation, contain technical information and recommendations to provide a basis for promulgation of new occupational health regulations.

Each draft technical standard was evaluated several times. Peer reviews were conducted by representatives from industry, professional associations, and the NIOSH/OSHA SCP steering committee. These reviews ensured that each document was internally consistent in format and that the technical recommendations reflected the best data available.

SCP data came from a variety of sources. These include recognized textbooks in industrial hygiene, medicine, toxicology, and analytical chemistry, and articles from technical journals. In addition, there were personal communications with representatives of industry and labor, meetings with industry associations, and interviews with individuals knowledgeable about specific industries, operations and processes, and associated occupational health problems. The information collected was organized for convenient use by the SCP Working Groups and resulted in an extensive data base, most of which has been reproduced in these guidelines. The protocol for data collection and evaluation is explained in *The Standards Completion Program Draft Technical Standards Analysis and Decision Logics*, available from the National Technical Information Service, Springfield, Virginia 22161, as publication PB-282 989.

*Occupational Health Guidelines for Chemical Hazards* is being published to disseminate technical information assembled under the SCP project and the recommendations resulting from that effort. This document is intended primarily for the industrial hygienist and medical surveillance personnel responsible for initiating and maintaining an occupational health program. It may also be used by others, including workers, for obtaining summary information about specific chemical substances found at the worksite. Each guideline includes data on chemical names and synonyms, permissible exposure limits, chemical and physical properties, and signs and symptoms of overexposure, as well as recommendations for environmental and medical monitoring procedures, respiratory and personal protective equipment use, control measures, and procedures for emergency treatment and conditions. These recommendations reflect good industrial hygiene and medical surveillance practices, and their implementation will assist in achieving a sound occupational health program.

Information in these guidelines has been edited and reformatted from the SCP draft technical standards and various working documents used during their development. In some instances, the original draft technical standards have been updated. This is particularly true of those substances for which NIOSH has recommended an occupational health standard under its criteria document program or for which OSHA

has completed rulemaking on a specific chemical. Each substance for which NIOSH has completed a criteria document is listed in Table 1, and identified by a notation in the Permissible Exposure Limit section of the appropriate guideline. The health hazard information in that guideline has been updated to reflect NIOSH's recommendations. For more detailed information, readers may obtain individual criteria documents from: Technical Information Branch, Division of Criteria Documentation and Standards Development, NIOSH, 4676 Columbia Parkway, Cincinnati, Ohio 45226. Where OSHA has completed rulemaking on a chemical, the recommendations in the affected guideline reflect the regulations promulgated since 1972 (listed in Table 2). In some cases pending court action filed at later dates may alter individual regulations.

Every attempt has been made to include all known effects resulting from exposure to the chemicals included in these guidelines and to provide up-to-date recommendations for medical surveillance and industrial hygiene practices. However, information on effects is rapidly changing as a result of recent research or reviews of the literature more in depth than those in the Standards Completion Program. This is particularly true for chronic effects, especially carcinogenic effects and some chemicals have only recently been shown or considered prime candidates to be carcinogenic. To assist in identifying these chemicals several sources that have reviewed their carcinogenic potential in more depth have been consulted.

These sources of information were: OSHA's "List of Substances Which May be Candidates of Further Scientific Review and Possible Identification, Classification, and Regulation as Potential Carcinogens," the "Candidate List" published in the *Federal Register*, August 12, 1980; evidence of carcinogenic effects of chemicals, received by the Environmental Protection Agency (EPA) under section 8(e) of the Toxic Substances Control Act; the EPA's Carcinogen Assessment Group's (CAG) List of Carcinogens, July 14, 1980; and the Monographs of the International Agency for Research on Cancer (IARC), Volumes 1-23, 1972-1980. When a chemical appeared in one or more of these information sources, a "Special Note" is included in the guideline to identify the source. Since the EPA CAG list has been included as part of the OSHA "Candidate List," it can be assumed that those chemicals with a reference to the OSHA "Candidate List" are also of concern to EPA. For IARC notations, only those substances listed in the NIOSH Registry of Toxic Effects of Chemical Substances as positive for humans or animals or as suspect carcinogens are included. Where the guidelines refer to several chemicals as one designation (e.g., chromium compounds), the notation indicates that evidence of carcinogenicity exists for at least one of the substances. Where readers are aware of information that would assist in further evaluation of the toxicity of these chemicals they are urged to provide us with the data so that it may be considered for inclusion in future updates of these guidelines. In this regard, NIOSH is initiating a project to systematically review and update the guidelines published and to add new subjects to the list.

Because some SCP information requires updating before it can be published, approximately 100 subjects having OSHA regulations are not included in this volume of the guidelines. These subjects are identified by an asterisk after the chemical name in the Table of Contents. Guidelines for these are being revised and will be issued as supplements at a later date.

Although every effort is made to prepare each guideline as accurately as possible, errors can and do occur. Readers are requested to use the enclosed reader response card to notify the editor of errors so they can be corrected in future editions.

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Acetylene	July 1, 1976	2,500-ppm (10% of lower explosive limit)	No exposure in excess of 2,500-ppm (2,662 mg/cu m)	Indirect asphyxia	Employers to check for, and inform employees of contaminants such as arsine and phosphine
Acrylamide	October 21, 1976	0.3 mg/cu m, 8-hr TWA (skin)	0.3 mg/cu m TWA	Skin, eye, nervous system effects	Skin and eye contact to be prevented

\*Table 1 provides a summary of the major environmental and medical recommendations found in the criteria documents published by the National Institute for Occupational Safety and Health (NIOSH). The intent of the table is to provide, in rapid-reference form, the recommendations as well as the current Federal standard and the date of transmittal to the Department of Labor of each document. In addition, the significant health effect or effects that were considered in the derivation of the recommendations is presented. Other information that may be pertinent to the substance or hazard is included under comments.

It should be noted that no attempt is made to provide all those details necessary for a complete understanding of the documents in the table. Reference to the full criteria document is recommended for those wishing to have further elements of the recommended standard such as work practices and sampling and analytic methods. These elements are also summarized in the occupational health guidelines for individual chemicals.

Copies of Criteria Documents can be obtained from:

Technical Information Branch  
NIOSH  
4676 Columbia Parkway  
Cincinnati, Ohio 45226

\*\*NIOSH TWA recommendations based on up to a 10-hr exposure unless otherwise noted.

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Acrylonitrile	September 28, 1977	2-ppm, 8-hr TWA; 10-ppm ceiling (15-minute)(skin)	Not greater than 4-ppm by recommended method (8.7 mg/cu m)	Lung and bowel cancer	Chest x-ray re- quired. First aid and medical kits to be available during use. Hazardous liquid, skin. Federal standard promulgated October 3, 1978
Aldrin/Dieldrin (Special Hazard Review)	September 7, 1978	0.25 mg/cu m, 8-hr TWA (skin)	Lowest reliably detectable level; 0.15 mg/cu m TWA by NIOSH validated method. Skin contact to be prevented	Cancer	
Alkanes (C5-C8)	March 29, 1977	1000-ppm, 8-hr TWA, pentane; 500-ppm, 8-hr TWA, n-hexane, n-heptane, octane	350 mg/cu m TWA (approx. 120-ppm pentane; 100-ppm hexane; 85-ppm heptane; 75-ppm octane) Mixtures to be not greater than 350 mg/cu m TWA; 1800 mg/cu m ceiling singly or mixtures (15-minute)	Skin and nervous system effects	Action level defined as 200 mg/cu m for these substances
Allyl chloride	September 21, 1976	1-ppm, 8-hr TWA	1-ppm TWA (3.1 mg/cu m); 3-ppm ceiling (9.3 mg/cu m) (15-minute)	Liver, kidney, lung effects	Urine, blood, and pulmonary function test- ing required

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Ammonia	July 15, 1974	50-ppm; 8-hr TWA	50-ppm ceiling (34.8 mg/cu m) (5-minute)	Airway irritation	Hazardous liquid eye damage
Antimony	September 28, 1978	0.5 mg/cu m, 8-hr TWA	0.5 mg/cu m TWA	Irritation; heart and lung effects	Chest x-ray, pulmonary function, and electrocardiogram testing required
Arsenic inorganic	January 21, 1974 Revised June 23, 1975	10 µg/cu m, 8-hr TWA	2 µg As/cu m ceiling (15-minute)	Dermatitis, lung and lymphatic cancer	Chest X-rays required. Federal standard promulgated May 5, 1978
Asbestos	January 21, 1972 Revised December 15, 1976	2,000,000 fibers/cu m 8-hr TWA 10,000,000 fibers/cu m ceiling	100,000 fibers/cu m over 5 microns TWA; 500,000 fibers/cu m over 5 microns ceiling; (15-minute)	Asbestosis, lung cancer	Federal standard promulgated July 7, 1972; TWA lowered July 1, 1976
Asphalt fumes	September 27, 1977	2.5 mg/cu m	5 mg/cu m ceiling (15-minute)	Eye and respiratory irritation	Hazardous substance, skin
Benzene	July 24, 1974 Revised July 25, 1977 ***	1-ppm, 8-hr TWA; 5-ppm ceiling (15-minute)(skin)	1-ppm ceiling (3.2 mg/cu m) (60-minute)	Blood changes including leukemia	Blood testing required. Federal standard promulgated February 10, 1978

\*\*\*Recommendation revised as a part of NIOSH testimony at OSHA hearing

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Benzidine-Based Dyes (Special Hazard Review)	November 16, 1979	Not controlled as such	Stringent work practices and controls; replacement with less toxic materials	Cancer	Urinary monitoring suggested
Benzoyl peroxide	June 7, 1977	5 mg/cu m, 8-hr TWA	5 mg/cu m TWA	Airway and eye irritation, skin effects	
Benzyl chloride	August 22, 1978	1-ppm (5 mg/cu m) 8-hr TWA	5 mg/cu m ceiling (15-minute)	Irritation; skin and eye effects	Chest x-ray and pulmonary function testing required
Beryllium	June 30, 1972 Revised August 19, 1977	2 µg/cu m, 8-hr TWA 5 µg/cu m acceptable ceiling; 25 µg/cu m maximum ceiling (30-minute)	0.5 µg/cu m (130-minute)	Lung cancer	Pulmonary function chest x-ray, and sputum cytology required
Boron Trifluoride	December 15, 1976	1-ppm Ceiling	None recommended	Respiratory system effects	Adequate procedures for sampling and analysis not available; pulmonary function testing required

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Cadmium	August 23, 1976	0.1 mg/cu m, 8-hr TWA; 0.3 mg/cu m ceiling (fume; erroneously published as 3 mg/cu m) 0.2 mg/cu m, 8-hr TWA; 0.6 mg/cu m ceiling (dust)	40 µg/ cd/cu m TWA; 200 µg cd/cu m ceiling (15-minute)	Lung and kidney effects	Urine and pulmonary function testing required
Carbaryl	September 30, 1976	5 mg/cu m, 8-hr TWA	5 mg/cu m TWA	Nervous and reproductive system effects	Medical warnings of possible effects on reproductive system and minimum exposure during pregnancy required; skin and eye contact to be prevented
Carbon black	September 7, 1978	3.5 mg/cu m, 8-hr TWA	3.5 mg/cu m TWA; 0.1 mg/cu m TWA in presence of polycyclic aromatic hydrocarbons	Lung, heart, and skin effects; cancer	Chest x-rays, pulmonary function testing, ECG, and sputum cytology required
Carbon dioxide	August 11, 1976	5,000-ppm, 8-hr TWA	10,000-ppm TWA (18,000 mg/cu m) 30,000-ppm ceiling (54,000 mg/cu m) (10-minute)	Respiratory effects	

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Carbon disulfide	May 4, 1977	20-ppm, 8-hr TWA; 30-ppm acceptable ceiling; 100-ppm maximum ceiling	1-ppm TWA (3 mg/cu m); 10-ppm ceiling (30 mg/cu m) (15-minute)	Heart, nervous and reproductive system effects	Employees to be advised of potential effects on reproductive system
Carbon monoxide	August 3, 1972	50-ppm, 8-hr TWA	35-ppm TWA (40 mg/cu m); 200-ppm ceiling (229 mg/cu m)	Heart effects	
Carbon tetrachloride	December 22, 1975 Revised June 9, 1976	10-ppm, 8-hr TWA 25-ppm acceptable ceiling; 200-ppm maximum ceiling (5-minute in 4 hours)	2-ppm ceiling (12.6 mg/cu m) (60-minute)	Liver cancer	
Chlorine	May 25, 1976	1-ppm, 8-hr TWA	0.5-ppm ceiling (1.45 mg/cu m) (15-minute)	Eye/airway irritation	Chest x-rays required
Chloroform	September 11, 1974 Revised June 9, 1976	50-ppm ceiling	2-ppm ceiling (9.78 mg/cu m) (60-minute)	Liver or kidney tumors and central nervous system effects	Current federal standard should be TWA: published as "C" in error



Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Chloroprene	August 12, 1977	25-ppm, 8-hr TWA	1-ppm ceiling (3.6 mg/cu m) (15-minute)	Reproductive effects; potential for cancer	Chest x-ray and pulmonary function testing required; medical warnings to workers concerning reproductive effects in animals; pregnant workers to be counseled about continuing work with chloroprene
Chromic acid	July 17, 1973	1 mg/10 cu m ceiling	0.05 mg CrO <sub>3</sub> /cu m TWA 0.1 mg CrO <sub>3</sub> /cu m ceiling (15-minute)	Nasal ulceration	
Chromium (VI)	December 1, 1975	100 µg/cu m ceiling	1 µg/cu m for carcinogenic Cr (VI); 25 µg/cu m TWA for other Cr(VI); 50 µg/cu m ceiling (15-minute)	Lung cancer, skin ulcers, lung irritation	Employer must demonstrate absence of carcinogenic Cr(VI); X-ray required
Chrysene (Special Hazard Review)	June 2, 1978	None	To be controlled as an occupational carcinogen	Cancer	Control recommendations also included for polycyclic aromatic hydrocarbons

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Coal Gasification Plants	September 7, 1978	Existing Federal occupational exposure limits or NIOSH recommended limits for specific hazards to be enforced		Various effects depending on substances present. Carcinogenic potential	Extensive work practice and Control procedures recommended. Document limited to those technologies most likely to be operational in the U.S.
Coal tar products	September 27, 1977	None	0.1 mg/cu m TWA, (cyclohexane-extractable fraction)	Lung and skin cancer	Includes coal tar, creosote, and coal tar pitch. Pulmonary function testing, chest x-rays, and sputum cytology required
Coke oven emissions	February 28, 1973	150 µg/cu m, 8-hr TWA	Work practices to minimize exposure to emissions	Lung cancer	Sputum cytology and chest X-ray required. Federal standard promulgated Oct. 22, 1976
Working in Confined Spaces	January 2, 1980	Numerous sections under 29 CFR 1910 (General Industry Safety and Health Standards)	Various recommendations including a permit-entry system to prevent worker injury and death	Injury and death	

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Cotton dust	September 26, 1974	200 µg/cu m, 8-hr TWA (yarn manufacturing); 750 µg/cu m, 8-hr TWA (slashing and weaving operations); 500 µg/cu m, 8-hr TWA (all other operations)	200 µg/cu m lint-free cotton dust	Pulmonary disease (byssinosis)	Pulmonary function testing required. Federal standard promulgated June 23, 1978
Cresol	February 28, 1978	22 mg/cu m 8-hr TWA "skin"	10 mg/cu m TWA	Skin, liver, kidney, and pancreas effects	Applies to mixtures of cresols and cresylic acid. Hazardous substance, skin and eyes. Possible delayed effects
Cyanide, hydrogen and cyanide salts	October 4, 1976	10-ppm, 8-hr TWA (alkali cyanides) cyanide 5 mg CN/cu m (skin)	5 mg CN/cu m ceiling (4.7-ppm) (10-minute)	Thyroid, blood, respiratory system effects	Concurrent measurement required for HCN when measuring for cyanide salt; trained first-aid personnel and first-aid kits to be available during use. Hazardous liquid, skin and eye

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
DDT (Special Hazard Review)	September 7, 1978	1 mg/cu m, 8-hr TWA (skin)	Lowest reliably detectable level; 0.5 mg/cu m TWA by NIOSH validated method. Skin contact to be avoided	Cancer	
Decomposition products of fluorocarbon	September 26, 1977	None	None recommended	Lung effects, polymer fume fever	Workroom air to be monitored for inorganic fluorides and hydrogen fluoride
Dibromochloropropane	September 2, 1977	1-ppb, 8-hr TWA; Eye and skin contact to be avoided	10-ppb ceiling (0.1 mg/cu m) (30-minute)	Sterility; renal and liver effects	Medical warnings to workers of reproductive system abnormalities including sterility, and notice of findings of cancer in animals following direct gastric application. Federal standard promulgated March 17, 1978

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Diisocyanates	September 27, 1978	0.02-ppm (0.14 mg/cu m) ceiling (TDI); 0.02-ppm (0.2 mg/cu m) ceiling (MDI)	ALL VALUES ARE IN (µg/cu m) toluene diisocyanate (TDI): 35 TWA, 140 ceiling; diphenylmethane diisocyanate (MDI): 50 TWA, 200 ceiling; hexamethylene diisocyanate (HDI): 35 TWA, 140 ceiling; naphthalene diisocyanate (NDI): 40 TWA, 170 ceiling; isophorene diisocyanate (IPDI): 45 TWA, 180 ceiling; dicyclohexylmethane 4,4'-diisocyanate (hydrogenated MDI): 55 TWA, 210 ceiling; Other diisocyanates to be controlled to 20-ppb ceiling and 5-ppb TWA	Respiratory effects and sensitization; irritation	Chest x-ray and pulmonary function testing required
Dinitro-ortho-cresol	February 28, 1978	0.1 mg/cu m 8-hr TWA "skin"	0.2 mg/cu m TWA	CNS and metabolic effects	Blood and urine monitoring required. Hazardous substance, skin and eyes. Possible delayed effects

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Dioxane	September 1, 1977	100-ppm, 8-hr TWA (skin)	1-ppm ceiling (3.6 mg/cu m) (30-minute)	Liver and kidney effects; cancer	Blood and urine testing required; hazardous liquid, skin
Emergency Egress from Elevated Workstations	December 1, 1975	Sections under Subpart E, General Industry standards and Subpart R, 29 CFR 1910.261	Various recommendations concerning means and availability of egress from high and low hazard situations	Trauma and injury	
Epichlorohydrin	September 17, 1976	5-ppm, 8-hr TWA (20 mg/cu m)	2 mg/cu m TWA; 19 mg/cu m ceiling (15-minute)	Skin, kidney, liver, and respiratory system effects	Medical warning infertility effects required; hazardous liquid, skin
Ethylene dibromide	August 25, 1977	20-ppm, 8-hr TWA; 30-ppm acceptable ceiling; 50-ppm maximum peak (5-minute)	1 mg/cu m ceiling (0.13-ppm) (15-minute)	Damage to skin, eyes, heart, liver, spleen, respiratory and central nervous systems. Potential for cancer and mutagenesis	Medical warnings to workers of potential reproductive abnormalities and cancer following direct administration in animals; hazardous liquid, contact to be prevented

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Ethylene dichloride	March 9, 1976 Revised September 29, 1978 (Special Hazard Review)	50-ppm, 8-hr TWA; 100-ppm acceptable ceiling; 200-ppm maximum ceiling (5-minutes in 3 hours)	1 ppm TWA (4 mg/cu m); 2-ppm ceiling (2 mg/cu m) (15-minute)	Cancer; nervous system, respiratory, heart and liver effects	Nursing infants at risk
Ethylene oxide (Special Hazard Review)	September 9, 1977	90 mg/cu m (50-ppm), 8-hr TWA	90 mg/cu m (50-ppm) TWA; 135 mg/cu m (75-ppm) ceiling (15-minute)	Mutagenesis; cancer	Recommendations for blood monitoring and medical counseling concerning mutations found in animal tests
Ethylene thiourea (Special Hazard Review)	October 13, 1978	None	Use of encapsulated form in industry; Worker exposure to be minimized	Carcinogenesis and teratogenesis	Workers to be informed of carcinogenic and teratogenic hazards. Special attention to be given to thyroid function tests
Fibrous glass	April 15, 1977	15 mg/cu m total dust; 5 mg/cu m respirable fraction (nuisance dust)	3,000,000 fibers/cu m TWA (fibers & 3.5 microns diameter and & 10 microns length); 5 mg/cu m TWA (total fibrous glass)	Eye, skin and airway effects	NIOSH recommends this limit also apply to other man-made fibers
Fluorides, inorganic	June 30, 1975	2.5 mg/cu m, 8-hr TWA	2.5 mg F/cu m TWA	Kidney and bone effects	Urine monitoring required

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Formaldehyde	December 30, 1976	3-ppm, 8-hr TWA; 5-ppm acceptable ceiling; 10-ppm maximum ceiling (30-minute)	1.2 mg/cu m ceiling (1-ppm) (30-minute)	Irritation, lung effects	Hazardous liquid, skin
Furfuryl Alcohol	March 1, 1979	50-ppm, 8-hr TWA	50-ppm (200 mg/cu m) TWA	Respiratory System Effects	
Glycidyl ethers	June 30, 1978	45 mg/cu m, ceiling (Allylglycidyl ether); 270 mg/cu m, 8-hr TWA (n-butyl glycidyl ether); 2.8 mg/cu m, 8-hr TWA (di2,3-epoxypropyl ether); 240 mg/cu m 8-hr TWA (isopropyl glycidyl ether); 60 mg/cu m 8-hr TWA, (phenyl glycidyl ether)	45 mg/cu m (AGE); 30 mg/cu m (BGE); 1 mg/cu m (DGE); 240 mg/cu m (IGE); 5 mg/cu m (PGE); all ceiling values (15-minute)	Skin, mucous membrane effects, sensitization potential. Tumorigenesis and mutagenesis	Possible additive effects with mixtures
Hot Environments	June 30, 1972	None	Action Levels: 79 degrees F WBGT (men) 76 degrees F WBGT (women); sliding scale limits for unimpaired mental performance	Heat Illnesses	Factors recommended include acclimatization, work practices, and employee protection



Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Hydrazines	June 30, 1978	1.3 mg/cu m (hydrazine), 1.0 mg/cu m (1,1-dimethyl-hydrazine), 22 mg/cu m (phenyl-hydrazine) as 8-hr TWA values; 0.35 mg/cu m ceiling (methyl-hydrazine)	0.04 mg/cu m (hydrazine), 0.15 mg/cu m (1,1-dimethyl-hydrazine), 0.6 mg/cu m (phenyl-hydrazine), 0.08 mg/cu m (methyl-hydrazine). All as ceiling values (120-minute)	Liver, blood, eye, skin effects; cancer	Blood and urine monitoring, chest x-ray required. Bowel examination required for some workers
Hydrogen fluoride	March 9, 1976	3-ppm, 8-hr TWA	2.5 mg F/cu m TWA (approx. 6-ppm); 5.0 mg/cu m ceiling (approx. 12-ppm) (15-minute, fluoride ion)	Skin/eye/airway irritation; bone effects	Pelvic x-ray (male) and urine testing required
Hydrogen sulfide	May 4, 1977	20-ppm acceptable ceiling; 50-ppm maximum ceiling (10-minute)	15 mg/cu m ceiling (approx. 10-ppm) (10-minute)	Irritation; severe acute effects, nervous and respiratory systems	Continuous monitoring required if potential exists for exposure to 70 mg/cu m or greater; evacuation required at this level
Hydroquinone	April 21, 1978	2 mg/cu m, 8-hr TWA	2 mg/cu m ceiling (15-minute)	Eye and skin effects	Special provisions for darkroom use

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Identification System for Occupationally Hazardous Materials	December 20, 1974	Not Applicable	Components of a complete system for hazardous materials		Includes definition, safety data sheets, alert symbols, and label statements
Isopropyl alcohol	March 9, 1976	400-ppm, 8-hr TWA	400-ppm TWA, (984 mg/cu m); 800-ppm ceiling (1968 mg/cu m) (15-minute)	Mucous membrane irritation; possible cancer threat in manufacturing process	More stringent work practices and medical surveillance for manufacturing workers
Kepon	January 27, 1976	None	1 µg/cu m ceiling (15-minute)	Nervous system effects; liver cancer	Liver function testing required

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments			
Ketones	June 30, 1978	Acetone 2,400 mg/cu m	590 mg/cu m TWA	Irritation; liver, kidney and nervous system effects	Urinalysis required. Warning of nervous system effects in workers exposed to methyl n-butyl ketone			
		Methyl ethyl Ketone 590 mg/cu m	590 mg/cu m TWA					
		Methyl n-propyl Ketone 700 mg/cu m	530 mg/cu m TWA					
		Methyl n-butyl Ketone 410 mg/cu m	4 mg/cu m TWA					
		Methyl n-amyl Ketone 465 mg/cu m	465 mg/cu m TWA					
		Methyl isobutyl Ketone 410 mg/cu m	200 mg/cu m TWA					
		Methyl isoamyl Ketone None	230 mg/cu m TWA					
		Diisobutyl Ketone 290 mg/cu m	140 mg/cu m TWA					
		Cyclohexanone 200 mg/cu m	100 mg/cu m TWA					
		Mesityl oxide 100 mg/cu m	40 mg/cu m TWA					
		Diacetone alcohol 240 mg/cu m	240 mg/cu m TWA					
		Isophorone 140 mg/cu m	23 mg/cu m TWA					
		ALL VALUES 8-hr TWA						

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Lead, inorganic	January 5, 1973  March, 1977***	50 µg/cu m, 8-hr TWA;  Over 8-hr. exposure to be determined by formula	Less than 100 µg/cu m	Kidney, blood, and nervous system effects Nervous system effects	Air level to be maintained so that worker blood lead remains at or below 0.060 mg/100g; blood monitoring required. Federal standard promulgated November 14, 1978
Logging-From felling to first haul	July 1, 1976	Not Applicable	Extensive work practice and personal protection recommendations	Primarily trauma and falls	Immunization and first-aid programs to be instituted
Malathion	July 1, 1976	15 mg/cu m, 8-hr TWA	15 mg/cu m TWA	Nervous system effects	Skin contact to be prevented; blood monitoring required
Mercury, inorganic	January 5, 1973	0.1 mg/cu m ceiling	0.05 mg/cu m TWA	Central nervous system and mental effects	

\*\*\*Recommendation revised as a part of NIOSH testimony at OSHA hearing

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Methyl alcohol	March 22, 1976	200-ppm TWA	200-ppm TWA (262 mg/cu m); 800-ppm ceiling (1048 mg/cu m) (15-minute)	Blindness; metabolic acidosis	
4,4'-Methylene- bis(2-Chloro- aniline) (Special Hazard Review)	September 7, 1978	None - standard remanded by court	3 µg/cu m TWA; Skin contact to be avoided	Cancer	Chest x-ray, blood and urine testing required
Methyl parathion	September 30, 1976	None	0.2 mg/cu m TWA	Nervous system effects	Skin contact to be prevented; blood monitor- ing required
Methylene chloride	March 9, 1976	500-ppm, 8-hr TWA; 1000-ppm acceptable ceiling; 2000-ppm maximum (5-minutes in 2 hours)	75-ppm TWA (261 mg/cu m); 500-ppm ceiling (1740 mg/cu m) to be lowered in presence of carbon monoxide	Central nervous system effects; carbon monoxide toxicity	Blood monitoring required
Nickel carbonyl (Special Hazard Review)	May 27, 1977	7 µg/cu m (1-ppb), 8-hr TWA	7 µg/cu m (1-ppb) TWA	Cancer	Recommendations for chest x-ray, pulmonary function, and urine monitor- ing
Nickel, inorganic and compounds	May 13, 1977	1 mg/cu m, 8-hr TWA	15 µg Ni/cu m TWA	Skin effects; lung and nasal cancer	Chest x-ray and pulmonary function testing required

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Nitric acid	March 9, 1976	2-ppm, 8-hr TWA	2-ppm TWA (5 mg/cu m)	Dental erosion, nasal/lung irritation	Hazardous liquid, eyes and skin. Chest x-ray required
Nitriles	September 27, 1978	70 mg/cu m (40-ppm), 8-hr TWA (acetonitrile); 3 mg/cu m (0.5-ppm), 8-hr TWA, "skin" (tetramethylsuccinonitrile)	To be TWA values: acetonitrile: 34 mg/cu m, (20-ppm); n-butyronitrile: 22 mg/cu m, (8-ppm); isobutyronitrile: 22 mg/cu m, (8-ppm); propionitrile: 14 mg/cu m, (6-ppm); malononitrile: 8 mg/cu m, (3-ppm); adiponitrile: 18 mg/cu m, (4-ppm); succinonitrile: 20 mg/cu m, (6-ppm)  To be ceiling values (15-minute): acetone cyanohydrin: 4 mg/cu m, (1-ppm); glycolonitrile: 5 mg/cu m, (2-ppm); tetramethyl succinonitrile: 6 mg/cu m, (1-ppm)  When present as mixtures or with other sources of cyanide, exposure to be considered	Hepatic, renal, respiratory, cardiovascular, gastrointestinal and nervous system effects	Chest x-ray and pulmonary function testing required. Trained personnel and first-aid kits to be available during use. Hazardous substances, skin and eyes

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
			additive and environmental limit to be calculated		
Nitrogen, Oxides	March 22, 1976	NO <sub>2</sub> : 5-ppm, 8-hr TWA	NO <sub>2</sub> : 1-ppm (1.8 mg/cu m) ceiling (15-minute)	Airway effects	Pulmonary function testing required
		NO: 25-ppm, 8-hr TWA	NO: 25-ppm TWA (30 mg/cu m)	Blood effects	
Nitroglycerin: Ethylene Glycol Dinitrate	June 30, 1978	2 mg/cu m (skin) 8-hr TWA (nitroglycerin); 1 mg/cu m (skin) ceiling, (EDGN)	0.1 mg/cu m ceiling (20-minute)	Circulatory system effects	Skin contact to be prevented; recommended limit for either substance alone or mixtures
Noise	August 10, 1972	90 dBA, 8-hr TWA	85 dBA TWA; 115 dBA ceiling	Hearing damage	
Organotin compounds	November 12, 1976	0.1 mg tin/cu m 8-hr TWA	0.1 mg tin/cu m TWA	Eye, skin, liver, nervous system, and heart effects	Chest X-ray, blood and urine monitoring, eye tests, heart examination, and nervous system testing required liquid, skin and eyes

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Parathion	June 30, 1976	0.11 mg/cu m TWA	0.05 mg/cu m TWA	Nervous system effects	Skin contact to be prevented; blood monitoring required
Pesticide Manufacturing and Formulation	July 17, 1978	Current OSHA or previously recommended NIOSH levels to be followed. Stringent workpractice and medical surveillance requirements to be instituted. Pesticides considered in 3 groups based on toxicity. Skin contact to be prevented.		Wide range of toxicities considered. Nervous and reproductive system effects. Cancer	Blood monitoring required for some groups. Medical warning of reproductive system effects in some compounds.
Phenol	June 30, 1976	5-ppm, 8-hr TWA (skin)	20 mg/cu m TWA (5.2 ppm); 60 mg/cu m ceiling (15.6 ppm) (15-minute)	Skin, eye, CNS, liver, and kidney effects	Hazardous substance, skin and eyes
Phosgene	February 23, 1976	0.1-ppm, 8-hr TWA	0.1-ppm TWA (0.4 mg/cu m); 0.2-ppm ceiling (0.8 mg/cu m) (15-minute)	Airway effects	Pulmonary function testing and x-ray required
Polychlorinated Biphenyls	September 27, 1977	1 mg/cu m, 8-hr TWA (42% chlorine); 0.5 mg/cu m, 8-hr TWA (54% chlorine)	1 µg/cu m TWA	Cancer; skin, liver, and reproductive effects	Blood testing required. Medical warning of adverse effects to be given to women workers of child-bearing age and nursing mothers



Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Refined Petroleum Solvent	July 19, 1977	500-ppm, 8-hr TWA (2950 mg/cu m) (stoddard solvents)	350 mg/cu m TWA; 1800 mg/cu m ceiling (15-minute)	Skin, lung, and nerve irritation	Blood and urine monitoring required. Action level for petroleum ether, rubber solvent, naphtha to be 200 mg/cu m TWA; action level for mineral spirits and Stoddard solvent to be 350 mg/cu m TWA; action level for kerosene to be 100 mg/cu m TWA. Hazardous substance skin
Silica, crystalline	November 11, 1974	250/%SiO + 5 in mppcf, or 10 mg/cu m/%SiO+2 (respirable quartz)	50 µg/cu m TWA, respirable free silica	Chronic lung disease (Silicosis)	X-ray, pulmonary function testing required
Sodium hydroxide	September 16, 1975	2 mg/cu m, 8-hr TWA	2 mg/cu m ceiling (15-minute)	Airway irritation	Hazardous liquid, eyes and skin
Sulfur dioxide	February 11, 1974 Revised May 12, 1977 ***	5-ppm, 8-hr TWA	0.5-ppm TWA (1.3 mg/cu m)	Respiratory effects	Pulmonary function testing required
Sulfuric acid	June 6, 1974	1 mg/cu m, 8-hr TWA	1 mg/cu m TWA	Pulmonary irritation	Hazardous liquid, eye and skin

\*\*\*Recommendation revised as a part of NIOSH testimony at OSHA hearing

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
1,1,2,2-Tetrachloroethane	December 17, 1976	5-ppm; 8-hr TWA (skin)	1-ppm TWA (6.87 mg/cu m)	Liver, gastrointestinal, and nervous system effects	Skin contact to be prevented. Blood monitoring required
Tetrachloroethylene	July 2, 1976	100-ppm, 8-hr TWA; 200-ppm acceptable maximum ceiling; 300-ppm maximum ceiling (5-minutes in 3 hours)	50-ppm TWA (339 mg/cu m); 100-ppm ceiling (678 mg/cu m) (15-minute)	Nervous system, heart, respiratory, liver effects	Medical warning of possible congenital abnormalities required
Thiols: n-alkane mono, cyclohexane, and benzene	September 26, 1978	10-ppm, 8-hr TWA (butylmercaptan); 10-ppm ceiling (methyl and ethyl mercaptan)	Ceilings 15-minute: benzenethiol: 0.5 mg/cu m, (0.1-ppm); 1-methanethiol: 1.0 mg/cu m, (0.5-ppm); 1-ethanethiol: 1.3 mg/cu m, (0.5-ppm); 1-propanethiol: 1.6 mg/cu m, (0.5-ppm); 1-butanethiol: 1.8 mg/cu m, (0.5-ppm); 1-pentanethiol: 2.1 mg/cu m, (0.5-ppm); 1-hexanethiol: 2.4 mg/cu m, (0.5-ppm); 1-heptanethiol: 2.7 mg/cu m, (0.5-ppm); 1-octanethiol: 3.0 mg/cu m, (0.5-ppm); 1-nonanethiol: 3.3 mg/cu m, (0.5-ppm); 1-decanethiol: 3.6 mg/cu m, (0.5-ppm); 1-undecanethiol:	Irritation, eye, skin, blood, and nervous system effects	Hazardous substance, skin. Blood and urine monitoring required

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
			3.9 mg/cu m, (0.5-ppm); 1-dodecanethiol: 4.1 mg/cu m, (0.5-ppm); 1-hexadecanethiol: 5.3 mg/cu m, (0.5-ppm); 1-octadecanethiol: 5.9 mg/cu m, (0.5-ppm); cyclohexanethiol: 2.4 mg/cu m, (0.5-ppm); Mixtures of thiols to be controlled by cal- culation of equivalent concentrations		
o-Tolidine	August 11, 1978	None	20 µg/cu m ceiling Skin contact to be prevented	Nasal irritation; cancer	Urine testing required; quar- terly urine monitor- ing recommended
Toluene	July 23, 1973	200-ppm, 8-hr TWA; 300-ppm acceptable ceiling; 500-ppm maximum ceiling (10-minute)	100-ppm TWA (375 mg/cu m); 200-ppm ceiling (750 mg/cu m) (10-minute)	Central nervous system depressant	
Toluene diisocyanate	July 13, 1973 Revised September 27, 1978	0.02-ppm ceiling	0.005-ppm TWA (0.035 mg/cu m); 0.02-ppm ceiling (0.14 mg/cu m) (20-minute)	Airway effects	Chest x-rays blood tests, pulmonary func- tion testing required. Rec- ommendations revised - See Diisocyanates

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
1,1,1,-Tri-chloroethane	July 2, 1976	350-ppm, 8-hr TWA	350-ppm ceiling (1910 mg/cu m) (15-minute)	Nervous system, liver, and heart effects	Action level set at 200-ppm TWA; medical warning of possible congenital abnormalities required
Trichloro-ethylene	July 23, 1973 Revised February 28, 1978 (Special Hazard Review)	100-ppm, 8-hr TWA; 200-ppm acceptable ceiling; 300-ppm maximum ceiling (5-minute in any 2 hours)	25-ppm (134 mg/cu m) TWA	Central nervous system depressant; cancer	Workers to be warned of hazards
Tungsten and cemented tungsten carbide	September 26, 1977	None	Insoluble tungsten: 5 mg/cu m TWA; soluble tungsten: 1 mg/cu m TWA; Dust of cemented tungsten carbide (& 2% cobalt): 0.1 mg cobalt/cu m TWA; Dust of cemented Tungsten carbide (& 0.3% nickel): 15 micrograms nickel/cu m TWA	Lung and skin effects	Pulmonary function testing and chest x-ray required
Ultraviolet radiation	December 20, 1972	10 mW/cm averaged over any 1-hr period	1.0 mW/cm for over 1000 sec.; 100 mW sec/cm for periods under 1000 sec.	Skin and eye effects	

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Vanadium	August 23, 1977	Vanadium pentoxide (dust): 0.5 mg/cu m ceiling; (fume) 0.1 mg/cu m ceiling Ferrovanadium: 1 mg/cu m, 8-hr TWA	Vanadium compounds: 0.05 mg/cu m ceiling (15-minute); metallic vanadium and vanadium carbide: 1 mg/cu m TWA	Eye, skin, and lung effects	Pulmonary function testing and chest x-ray required
Vinyl acetate	September 7, 1978	None	15 mg/cu m (4-ppm) ceiling (15-minute)	Irritation	
Vinyl chloride	March 11, 1974	1-ppm, 8-hr TWA; 5-ppm ceiling, (15-minute sample)	Minimum detectable level; 1-ppm ceiling (2.55 mg/cu m) (15-minute)	Liver cancer	Standard promulgated October 4, 1974 liver function testing required
Vinyl halides	September 12, 1978	1-ppm, 8-hr TWA; 5-ppm ceiling (15-minute)	As promulgated for vinyl chloride in 29 CFR 1910.1017 with eventual goal of zero exposure	Cancer	Document includes vinyl chloride, vinylidene chloride, vinyl bromide, vinyl fluoride, and vinylidene fluoride monomers
Waste anesthetic gases and vapors	March 4, 1977	None for substances when used as anesthetic agents	2-ppm ceiling (halogenated anesthetic agents) (1-hour); 25-PPM TWA during periods of use (nitrous oxide)	Reproductive effects and audiovisual performance decrements	Employees to be advised of potential effects; abnormal outcome of pregnancies of employees and spouse to be documented

Table 1  
SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS, January 1981

Substance	Transmitted to OSHA	Current OSHA Environmental Standard	NIOSH Recommendation for Environmental Exposure Limit**	Health Effect Considered	Comments
Xylene	May 23, 1975	100-ppm, 8-hr TWA	100-ppm TWA (434 mg/cu m); 200-ppm ceiling (868 mg/cu m) (10-minute)	Central nervous system depressant; airway irritation	
Zinc oxide	October 10, 1975	5 mg/cu m, 8-hr TWA	5 mg/cu m TWA, 15 mg/cu m ceiling (15-minute)	Metal fume fever	

**TABLE 2**  
**CHEMICAL SUBJECTS FOR WHICH OSHA HAS COMPLETED RULEMAKING 1972-1980**

<b>Chemical</b>	<b>Publication Date</b>	<b>29CFR Section</b>
2-Acetylaminofluorene	June 1974	1910.1014
Acrylonitrile	October 1978	1910.1045
alpha-Naphthylamine	June 1974	1910.1004
4-Aminodiphenyl	June 1974	1910.1011
Arsenic	May 1978	1910.1018
Asbestos	June 1978	1910.1001
Benzene	1978 (invalidated)	1910.1028
Benzidine	June 1974	1910.1010
beta-Naphthylamine	June 1974	1910.1009
beta-Propiolactone	June 1974	1910.1013
bis-Chloromethyl ether	June 1974	1910.1008
Coke Oven Emissions	October 1976	1910.1029
Cotton Dust	June 1978	1910.1043
Cotton Dust (in cotton Gins)	June 1978	1910.1046
Dibromochloropropane	March 1978	1910.1044
3,3'-Dichlorobenzidine (and its Salts)	June 1974	1910.1007
4-Dimethylaminoazobenzene	June 1974	1910.1015
Ethyleneimine	June 1974	1910.1012
Lead	November 1978	1910.1025
Methyl chloromethyl ether	June 1974	1910.1006
4,4'-Methylene-bis	June 1974	1910.1005
4-Nitrobiphenyl	June 1974	1910.1003
N-Nitrosodimethylamine	June 1974	1910.1016
Vinyl Chloride	October 1974	1910.1017

