

TOXIC EFFECTS OF IMPORTANT INDUSTRIAL CHEMICALS

<u>Substance</u>	<u>Formula</u>	<u>Usual Physical State</u>	<u>Max. Allowable Concn. p.p.m.</u>	<u>Toxic Manifestations</u>
Acetaldehyde	CH_3CHO	Liquid	200	Acute: irritation of ocular and respiratory mucous membrane, general narcotic action; Chronic: weight loss, central nervous system disturbances.
Acetic acid	CH_3COOH	Liquid	10	Skin and mucous membrane irritations; lachrymation.
Acetic anhydride	$(\text{CH}_3\text{CO})_2\text{O}$	Liquid	5	Irritation of eye and respiratory mucous membranes; skin irritant.
Acetone	CH_3COCH_3	Liquid	500	Central nervous system depression; headache; bronchial irritation.
Acrolein	$\text{CH}_2:\text{CHCHO}$	Liquid	0.5	Extreme irritant pulmonary edema after brief exposure.
Acrylonitrile	$\text{CH}_2:\text{CHCN}$	Liquid	20	Nausea; vomiting; weakness; fatigue; occasional liver damage.
Ammonia	NH_3	Gas	100	Irritation of respiratory passages; occasional pulmonary edema; bronchitis; irritation of eyes caustic action on skin.

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Amyl acetate	$\text{CH}_3\text{COO}(\text{CH}_2)_4\text{CH}_3$	Liquid	200	Limited toxicity occasional ir- ritation of eyes and nose; nar- cosis at high concentrations.
Aniline	$\text{C}_6\text{H}_5\text{NH}_2$	Liquid	5	Methemoglobin formation; diminished oxy- genation of blood; depres- sion of cir- culation; direct effect on heart; central nervous system irritant.
Arsine	AsH_3	Gas	0.05	Destruction of red blood cells with anemia and jaundice.
Benzene	C_6H_6	Liquid	35	Headache, dizziness, and muscular twitch- ings; central nervous system stimulation fol- lowed by nar- cosis; in chronic case, anemia and leu- kopenia.
Bromine	Br_2	Gas	1	Irritation of the mucous mem- branes of the eye and respira- tory passages.
1,3-Butadiene	$\text{CH}_2:\text{CHCH}:\text{CH}_2$	Gas	1000	Narcotic at high concentrations.

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2-Butanone	$\text{CH}_3\text{CH}_2\text{COCH}_3$	Liquid	250	Irritation of the nose and eyes; skin sensitization; narcosis at high concentrations.
n-Butyl acetate	$\text{CH}_3\text{COOC}_4\text{H}_9$	Liquid	200	Eye and nasal irritation; narcosis at high concentrations.
n-Butyl alcohol	$\text{CH}_3(\text{CH}_2)_2\text{CH}_2\text{OH}$	Liquid	100	Keratitis and central nervous system depression at high concentrations.
Butyl Cellosolve (2-butoxyethanol)	$\text{C}_4\text{H}_9\text{OCH}_2\text{CH}_2\text{OH}$	Liquid	200	Local irritating effects; hematuria; dyspnea; kidney damage.
Carbon dioxide	CO_2	Gas	5000	Irritation of respiratory passages; stimulation of the respiratory center; acts as simple asphyxi- ant.
Carbon disulfide	CS_2	Liquid	20	Narcotic action on the central nervous system leading to increased activity and paralysis of the respiratory center; chronic exposure: degeneration of the central nervous system with bizarre symptoms of psychiatric and neurologic disturbances.

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Carbon monoxide	CO	Gas	100	Headache; nausea; dizziness; muscular depression; death due to chemical anoxemia.
Carbon tetrachloride	CCl ₄	Liquid	50	Central nervous system depression with increased salivation, weakness, and unconsciousness; liver and kidney damage in chronic exposure, and general non-specific symptoms.
Cellosolve (2-ethoxyethanol)	C ₂ H ₅ OCH ₂ CH ₂ OH	Liquid	200	Slight irritation to mucous membrane and occasional kidney damage; practically nontoxic on chronic exposure.
Cellosolve acetate	CH ₃ COOCH ₂ CH ₂ OC ₂ H ₅	Liquid	100	Central nervous system depressant in high concentrations; eye irritant; occasional kidney damage.

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Chlorine	Cl_2	Gas	1	Irritation of respiratory and ocular membranes; acute spasm of larynx; pulmonary edema; secondary pneumonitis; direct injury to the teeth and skin.
Chlorobenzene	$\text{C}_6\text{H}_5\text{Cl}$	Liquid	75	Central nervous system depression.
Chloroform	CHCl_3	Liquid	100	Powerful anesthetic action with possible damage to the liver.
1-Chloro-1-nitro propane	$\text{CH}_3\text{CH}_2\text{CHClNO}_2$	Liquid	20	Irritation of the respiratory tract; damage to the liver, kidneys, and blood vessels.
Chloroprene (2-Chloro- 1,3-butadiene)	$\text{CH}_2:\text{CHCl}:\text{CH}_2$	Liquid	25	Depression of the central nervous system with liver and kidney damage; lowers blood pressure; irritates the respiratory tract.
Cyclohexane	$\text{CH}_2(\text{CH}_2)_4\text{CH}_2$	Liquid	400	Stimulation and then depression of the central nervous system with giddiness stupor, and paralysis of the respiratory center.

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Cyclohexanol	$\text{CH}_2(\text{CH}_2)_4\text{CHOH}$ <u> </u>	Liquid	100	Irritation of ocular and respiratory mucous membranes; depression of the central nervous system at high concentrations.
Cyclohexanone	$\text{CH}_2(\text{CH}_2)_4\text{CO}$ <u> </u>	Liquid	100	Irritation of the throat and mucous membranes of the respiratory tract; narcosis with depression of the central nervous system at high concentrations.
Cyclohexene	$\text{CH}_2(\text{CH}_2)_3\text{CH:CH}$ <u> </u>	Liquid	400	Irritation of the respiratory tract; depression of the central nervous system.
Cyclopropane	$\text{CH}_2.\text{CH}_2.\text{CH}_2$ <u> </u>	Gas	400	Giddiness; loss of consciousness; respiratory depression; cardiac disturbances in rate and rhythm.
<u>o</u> -Dichlorobenzene	$\text{C}_6\text{H}_4\text{Cl}_2$	Liquid	50	Local irritating effects; occasionally depression of the central nervous system with injury to the liver, jaundice, and abdominal tenderness.

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, , -Dichlorodiethyl ether (bis(2-chloro- ethyl)ether)	$(ClCH_2CH_2)_2O$	Liquid	15	Irritation of respiratory pas- sages and eyes with respiratory disturbance, gasping, and central nervous system depression.
Dichlorodifluoro- methane (Freon-12)	CCl_2F_2	Liquid	1000	Depression of the central nervous system only at high doses.
1,1-Dichloroethane (ethylidene chloride)	CH_3CHCl_2	Liquid	100	Depression of central nervous system; possible liver and kidney damage.
1,2-Dichloroethane (ethylene chloride)	CH_2ClCH_2Cl	Liquid	100	Irritation of respiratory tract; salivation; de- pressant of central nervous system.
1,2-Dichloroethylene	$CHCl:CHCl$	Liquid	200	Irritation of mucous membrane with specific ir- ritant action on the cornea; lacri- mation followed by corneal opacity, restlessness, twitching, con- vulsions; central nervous irritation and depression at high concentra- tions; no in- cidents of chronic industrial poisoning.

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Dichlorofluoromethane	CHCl_2F	Liquid	1000	Practically non-toxic with little physiological effect, except at high concentration; may decompose at high temperatures to form irritating and toxic substances.
Dichloromethane (methylene chloride)	CH_2Cl_2	Liquid	500	One of the least toxic of chloromethane derivatives; some irritation of mucous membranes; central nervous system depression with increased pulse rate and respiratory depression.
1,1-Dichloro-1-nitroethane	$\text{CH}_3\text{CCl}_2\text{NO}_2$	Liquid	10	Irritation of mucous membranes and skin; may produce severe pulmonary damage; may cause liver and kidney damage.
1,2-Dichloropropane (propylene chloride)	$\text{CH}_3\text{CHClCH}_2\text{Cl}$	Liquid	10	Central nervous system depression leading to narcosis at high concentration; hematuria, jaundice, and indications of liver and kidney damage on chronic exposure.

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1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon-114)	$\text{CClF}_2\text{CClF}_2$	Liquid	1000	Practically non-toxic; anesthetic at very high concentration; may decompose at high temperature to liberate irritating substances.
Dimethylaniline	$\text{C}_6\text{H}_5\text{N}(\text{CH}_3)_2$	Liquid	5	Headache, tachycardia, dyspnea, and other symptoms of methemoglobinemia; depressing effect on the nervous system with headache, weakness, giddiness, tremors, and convulsions prior to death.
Dimethyl sulfate	$(\text{CH}_3)_2\text{SO}_4$	Liquid	1	Local necrotizing action on the skin irritation to the respiratory tract and eyes which may be delayed; toxic involvement of the liver, kidneys, and heart as evidenced by impaired function of these organs.
Dioxane	$\text{O.CH}_2\text{CH}_2.\text{O.CH}_2.\text{CH}_2$ <u>' '</u>	Liquid	100	Irritation of respiratory tract and eyes, drowsiness, headache, vertigo, and other signs of central nervous system irritation; liver and kidney

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Dioxane (Continued)				damage with enlargement of the liver and marked depression of urinary output with hematuria.
Ethyl acetate	$\text{CH}_3\text{COOC}_2\text{H}_5$	Liquid	400	Irritation of mucous surfaces, particularly of the eyes, respiratory passages, and gums; mild narcotic; some indication of injury to liver, kidneys and blood on prolonged exposure.
Ethyl alcohol	$\text{C}_2\text{H}_5\text{OH}$	Liquid	1000	Not a serious industrial poison; Moderate irritation of eyes and upper respiratory tract; some degree of intoxication at high air concentration.
Ethylbenzene	$\text{C}_6\text{H}_5\text{C}_2\text{H}_5$	Liquid	200	Irritation of eyes and upper respiratory tract; moderate narcotic with depressing effects on motor activity.
Ethyl bromide	$\text{C}_2\text{H}_5\text{Br}$	Liquid	200	Marked irritation of lungs; central nervous system depression leading to anesthesia.

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Ethyl chloride	C_2H_5Cl	Liquid	1000	Central nervous system depression leading to rapid anesthesia; mild irritation of respiratory tract; some damaging effects on heart and liver.
Ethylene chlorohydrin	CH_2ClCH_2OH	Liquid	5	Nausea, headache, pains in chest, and central nervous system depression; marked irritation of respiratory tract leading to fatal pulmonary edema; irritation to skin and eyes; extreme dyspnea with disorientation in fatal cases.
Ethylene oxide	$O.\underset{\text{,}}{\underset{\text{'}}{CH_2}}.CH_2$	Gas	100	Relatively low toxicity to man, but will produce irritation of the eyes and nasal passages; at high concentrations, central nervous system depression marked by respiratory disturbances.
Ethyl ether	$(C_2H_5)_2O$	Liquid	400	Acute: central nervous system depression with anesthesia and death from depression of respiratory center; chronic: loss of appetite, dizziness, headache, psychic disturbance

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Ethyl formate	HCOC_2H_5	Liquid	100	Severe irritation of eyes and mucous membrane of upper respiratory tract; narcosis at high concentrations.
Ethyl orthosilicate (tetraethoxysilane)	$\text{Si}(\text{OC}_2\text{H}_5)_4$	Liquid	100	Lacrimation; moderate irritation of the respiratory tract; dyspnea and narcosis with respiratory depression.
Formaldehyde	HCHO	Gas	5	Markedly irritating to eyes and upper respiratory tract; severely irritating to skin and likely to cause sensitization; occasional gastro-intestinal upsets with kidney damage and softening of keratin-containing tissues.
Gasoline	$\text{C}_n\text{H}_{2n+2}$ (where n ranges from 5 to 8)	Liquid	500	Anesthetic with moderate depression of the central nervous system at low concentrations.
Heptane	$\text{CH}_3(\text{CH}_2)_5\text{CH}_3$	Liquid	500	Narcosis and anesthesia.
Hexane	$\text{CH}_3(\text{CH}_2)_4\text{CH}_3$	Liquid	500	Narcosis and anesthesia.

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Hydrogen chloride	HCl	Gas	5	Gastrointestinal disturbance with increased gastric acidity; chronic irritation of the respiratory tract; acute destruction of the teeth; dermatitis and irritation of the skin.
Hydrogen cyanide	HCN	Gas	10	Headache, dizziness, weakness, and loss of consciousness; death due to intracellular asphyxia.
Hydrogen fluoride	HF	Gas	3	Extensive irritation of the skin and respiratory tract leading to ulceration and pneumonitis.
Hydrogen selenide	H ₂ Se	Gas	0.05	Severe irritation of the respiratory tract leading to chemical pneumonitis; occasional gastrointestinal disturbances with nervousness, metallic taste, garlic odor of breath, and occasionally liver damage.
Hydrogen sulfide	H ₂ S	Gas	20	Primary irritation of the respiratory tract preceded by headache, giddiness, and followed

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Hydrogen sulfide (Continued)				occasionally by severe edema of the lungs; stimulation followed by paralysis of the respiratory centers.
Iodine	I ₂	Solid	1	Irritating and corrosive action on the skin and the mucous membranes with cough, lacrimation, headache, and vertigo prolonged absorption may result in mental depression, nervousness, and insomnia with mental changes.
Isoamyl alcohol	(CH ₃) ₂ CHCH ₂ CH ₂ OH	Liquid	100	Gastrointestinal disturbances; headache; irritation of mucous membrane at high concentrations; vertigo and collapse.
Isophorone	$ \begin{array}{c} \text{O} \\ \text{H}_2 \quad \text{H} \\ (\text{CH}_3)_2 \quad \text{CH}_3 \\ \text{H} \end{array} $	Liquid	25	Moderate irritation of the eyes, nose and throat; narcosis at high concentrations with occasional lung irritation; kidney damage may occur on prolonged exposure.

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Isopropyl alcohol	$(\text{CH}_3)_2\text{CHOH}$	Liquid	400	Not an industrial hazard; minor irritation of eyes and respiratory tract; nausea; moderate depression at high concentrations.
Isopropyl ether	$(\text{CH}_3)_2\text{CHOCH}(\text{CH}_3)_2$	Liquid	500	Central nervous system depression leading to varying degrees of anesthesia.
Mesityl oxide	$(\text{CH}_3)_2\text{C}:\text{CHCOCH}_3$	Liquid	50	Narcosis with depression of heart and respiratory rates: some cumulative toxicity.
Methanol	CH_3OH	Liquid	200	Muscular cramping; disturbances in digestion; general central nervous depression, with dizziness, stupor, blindness, and coma; optic nerve damage.
Methyl acetate	$\text{CH}_3\text{COOCH}_3$	Liquid	200	Ocular and nervous disturbances; inflammation of the eyes; respiratory difficulties; palpitation.
Methyl bromide	CH_3Br	Gas	20	Dermatitis; irritation of the respiratory system; gastrointestinal disturbances; central

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Methyl bromide (Continued)				nervous system depression with diplopia; chronic central confusion and psychotic episodes.
Methyl butyl ketone (2-hexanone)	$\text{CH}_3\text{COCH}_2(\text{CH}_2)_2\text{CH}_3$	Liquid	100	Irritation of the eye and nasal mucosa; central nervous system depressant at higher concentrations with depression of body temperature and respiratory and heart rate.
Methyl Cellosolve (2-methoxyethanol)	$\text{CH}_3\text{OCH}_2\text{CH}_2\text{OH}$	Liquid	25	Depressing effect on the blood picture with a tendency toward anemia; neurological disturbances with increased drowsiness and, in extreme cases, toxic encephalopathy.
Methyl Cellosolve acetate	$\text{CH}_3\text{COOCH}_2\text{CH}_2\text{OCH}_3$	Liquid	25	No industrial cases reported; however, mildly irritating to the respiratory tract and probably will produce toxic encephalopathy with confusion and degeneration of the central nervous system.

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Methyl chloride	CH_3Cl	Gas	100	Degenerative effects on the central nervous system with predominant disturbances of vision; mild poisoning is characterized by interference with locomotion and headache; severe poisoning may have indications of liver, kidney, and bonemarrow damage.
Methylcyclohexane	$\text{CH}_2(\text{CH}_2)_4\text{CHCH}_3$	Liquid	500	No industrial poisoning; the compound will produce irritation of the eyes and mucous membrane and narcosis with resulting convulsions and death due to the depression of the respiratory centers.
Methylcyclohexanol (mixture of <u>o</u> -, <u>m</u> - and <u>p</u> -)	$\text{CH}_3\text{C}_6\text{H}_{10}\text{OH}$	Liquid	100	Central nervous system depression; occasional irritation of mucous membrane at high concentrations.
Methylcyclohexanone (mixture of <u>o</u> -, <u>m</u> - and <u>p</u> -)	$\text{CH}_3\text{C}_6\text{H}_9\text{O}$	Liquid	100	Moderately irritating to the skin and mucous membranes; chief systemic effects

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Methylcyclohexanone (Continued)				are narcosis with decreased body temperature and convulsive movements.
Methyl formate	HCOOCH_3	Liquid	100	Irritation of the respiratory tract followed by central nervous system depression; narcosis and in-co-ordination.
Methyl isobutyl ketone (4-methyl-2-pentanone)	$\text{CH}_3\text{COCH}_2\text{CO}(\text{CH}_3)_2$	Liquid	100	Irritation of the conjunctival and nasal mucosa with narcosis at high concentrations characterized by decreased body temperature and rapid lowering of respiratory and heart rates.
Methyl propyl ketone (2-pentanone)	$\text{CH}_2\text{COCH}_2\text{CH}_2\text{CH}_3$	Liquid	200	Ocular and nasal irritation; central nervous depression at higher concentrations.
Naphtha (coal tar)		Liquid	200	Narcosis of the central nervous system; depressing effects on the red and white cell production leading to anemia and leukemia; liver and kidney damage.

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Naphtha (petroleum)		Liquid	500	Primarily central nervous system depression.
Nickel carbonyl	Ni (CO)_4	Liquid	1	Irritation; indigestion; edema of the lungs with dyspnea, vomiting and dry ineffective cough; cyanosis due to hypoxia.
Nitrobenzene	$\text{C}_6\text{H}_5\text{NO}_2$	Liquid	1	Anemia due to methemoglobin formation and depressed bone marrow function; fatigue; headache; loss of appetite; ulcer of the legs; marked cyanosis.
Nitroethane	$\text{C}_2\text{H}_5\text{NO}_2$	Liquid	100	Irritation of the upper respiratory tract and eyes; narcotic at high concentrations.
Nitrogen oxides	$\text{NO, NO}_2, \text{N}_2\text{O}_4$	Gas	25	Bronchial irritation; dizziness; headache; cough; respiratory difficulties; severe cardiac symptoms; occasionally methemoglobinemia.

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Nitroglycerin	CH_2NO_3 $ $ CHNO_3 $ $ CH_2NO_3	Liquid	0.5	Decreased blood pressure with a variety of central nervous system symptoms, including fainting and possible confusion, hallucination and maniacal manifestations with respiratory paralysis; considerable skin irritation and digestive disturbances.
Nitromethane	CH_3NO_2	Liquid	100	Irritation of the upper respiratory tract and eyes; disturbances in gait and muscular co-ordination due to stimulation and then depression of the central nervous system.
2-Nitropropane	$\text{CH}_3\text{CHNO}_2\text{CH}_3$	Liquid	50	Anorexia; nausea; vomiting; diarrhea; irritation of the respiratory tract and eyes; central nervous system irritation.
Octane	$\text{CH}_3(\text{CH}_2)_6\text{CH}_3$	Liquid	500	Moderate irritation of respiratory passages; vertigo; ataxia; muscular inco-ordination; respiratory depression at high concentrations.

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Ozone	O_3	Gas	1	Respiratory discomfort; headache; general depression; lowering of the metabolic rate; severe pulmonary irritation at high concentrations.
Pentane	$CH_3(CH_2)_3CH_3$	Liquid	1000	Drowsiness; vertigo; ataxia; anesthesia at high concentrations.
Phosgene	$COCl_2$	Gas	1	Extreme irritation of eyes and respiratory tract; severe lung damage with pulmonary edema, bronchiectasis, and pulmonary abscess.
Phosphine	PH_3	Gas	0.05	Acute: dyspnea, slowing of heart rate, lowered blood pressure, convulsions, coma, paralysis; chronic: anemia, nervous disorders, embrittlement of teeth and bones.
Phosphorus trichloride	PCl_3	Liquid	0.5	Irritation of mucous membranes of eyes and respiratory passages; dyspnea; severe pulmonary damage.

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Propyl acetate	$\text{CH}_3\text{COOCH}_2\text{CH}_2\text{CH}_3$	Liquid	200	Sleepiness; fatigue; depressed respiration; habituation; some irritation of respiratory tract; possible liver damage.
Stibine	SbH_3	Gas	0.1	Headache; nausea; weakness; decreased respiratory and cardiac rates; hematuria; anemia.
Stoddard Solvent	Petroleum fraction	Liquid	500	Irritation of mucous membranes; headache; fatigue, central nervous system depression.
Styrene (monomer)	$\text{C}_6\text{H}_5\text{CH}:\text{CH}_2$	Liquid	200	Irritation of nose and eyes; systemic disturbances.
Sulfur dioxide	SO_2	Gas	10	Alteration of sense of smell and taste; irritation of mucous membranes of eyes and throat; severely irritating to the lungs.
Sulfur monochloride	S_2Cl_2	Liquid	1	Irritation of eyes and respiratory tract; dyspnea, coughing, and severe pulmonary irritation at moderate concentrations.

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1,1,2,2-Tetrachloroethane	$\text{CHCl}_2\text{CHCl}_2$	Liquid	5	Acute: irritation of the central nervous system, acute yellow atrophy of the liver; chronic: headache, tremors, neurologic changes
Tetrachloroethylene (perchloroethylene)	$\text{CCl}_2:\text{CCl}_2$	Liquid	100	Nausea; excessive perspiration; dizziness; stupor; probably does not produce liver or kidney damage.
Toluene	$\text{C}_6\text{H}_5\text{CH}_3$	Liquid	200	Irritation of mucous membranes; headache; anorexia; weakness; stupor; liver damage; depression of bone marrow activity; anemia.
p-Toluidine	$\text{CH}_3\text{C}_6\text{H}_4\text{NH}_2$	Solid	5	Headache; weakness; dyspnea; cyanosis; methemoglobinemia; central nervous system stimulation followed by depression.
Trichloroethylene	$\text{CHCl}:\text{CCl}_2$	Liquid	100	Dermatitis; optic and fifth nerve neuritis; liver damage; central nervous system depression, irritation of the lung and respiratory tract.

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TOXIC EFFECTS OF IMPORTANT INDUSTRIAL CHEMICALS

<u>Substance</u>	<u>Formula</u>	<u>Usual Physical State</u>	<u>Max. Allowable Concn. p.p.m.</u>	<u>Toxic Manifestations</u>
Trichlorofluoromethane (Freon-11)	FCCl_3	Liquid	1000	Only a slightly toxic compound causing central nervous system depression due to anesthetic properties; mildly irritating at higher concentrations; death from paralysis of respiratory center.
Turpentine		Liquid	100	Nausea; vomiting; colic and diarrhea; hematuria; rapid breathing; palpitation; bronchitis; nephritis; coma.
Vinyl chloride	$\text{CH}_2:\text{CHCl}$	Gas	500	Dizziness and disorientation; changes in respiratory rate; narcosis.
Xylene (mixture of o-, m-, and p-)	$\text{C}_6\text{H}_4(\text{CH}_3)_2$	Liquid	200	Irritation of eyes and respiratory tract; central nervous system depression; liver damage; depression of red cell formation.
Antimony compounds		Solid	0.5	Dermatitis and conjunctivitis; produces a toxic picture similar to arsenic, but industrial poisoning rarely occurs.

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Arsenic compounds		Solid	0.5	Skin manifesta- tion including dermatitis, ulceration, and bronzing; per- foration of the nazal septum; gastrointestinal upset; occasional kidney and liver damage; neu- rological mani- festation, fre- quently peri- pheral neuritis.
Barium compounds		Solid	0.5	Gastrointestinal irritation, vomiting, colic, and diarrhea; oc- casional bron- chial irritation with pneumono- coniosis; whitening of the hair and depilation.
Cadmium compounds		Solid	0.1	Dermatitis and skin ulceration, dryness of the throat, head- ache, vomiting, constriction in the chest, fol- lowed by cough, chest pain, severe dysphoria; discoloration of the teeth; prostration.
Chlorinated diphenyls		Solid	1	Dermatitis, chiefly acne form; jaundice; hepatitis.

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Chlorinated naphthalenes:		Solid		
Pentachloro	$C_{10}H_3Cl_5$		0.5	Dermatitis, especially acne form; liver and kidney damage with jaundice, dark urine, and itching of the skin.
Trichloro	$C_{10}H_5Cl_3$		5	
Chromic acid and chromates	Calcd. as CrO_3	Solid	0.1	Dermatitis; perforation of the nasal septum; chrome ulcers; irritation of the respiratory tract possible long tumor formation.
Cyanides	Calcd. as CN	Gas	5	Headache; weakness; dizziness; occasional irritation of the eyes and respiratory tract; chest constriction; loss of consciousness with respiratory difficulty; paralysis.
4,6-Dinitro-O-cresol	$CH_3C_6H_2(NO_2)_2OH$	Solid	0.2	Liver and kidney damage; decreased vision and formation of cataracts; elevation of basal metabolic rate; thyroid changes.
Dinitrotoluene (mixtures of isomers)	$CH_3C_6H_3(NO_2)_2$	Solid	1.5	Metallic taste; muscular weakness headache; gastrointestinal disturbances including nausea,

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Dinitrotoluene (Continued)				vomiting, and anorexia; methemoglobin formation; pallor; cyanosis; anemia; dizziness.
Fluorides		Solid	2.5	Irritation of the nasal passages and respiratory tract, nosebleed due to inhalation of dust; following acute accidental ingestion, vomiting, abdominal pain, convulsions, muscular weakness, paresis, loss of consciousness, motor unrest; chronic poisoning: occasionally osteoporosis.
			<u>Max. Allowable Concn. mg./cu.m.</u>	
Iron oxide fumes	FeO , Fe_2O_3 , Fe_3O_4	Solid	15	No significant toxic effects; siderosis (deposition of iron in the pulmonary tissue) occurs, but there is no increased susceptibility to tuberculosis or pulmonary fibrotic disease.
Lead compounds		Solid	0.15	Loss of appetite; constipation; abdominal cramps; pallor; anemia; anorexia; irritability.

TOXIC EFFECTS OF IMPORTANT INDUSTRIAL CHEMICALS

<u>Substance</u>	<u>Formula</u>	<u>Usual Physical State</u>	<u>Max. Allowable Concn. mg./cu.m.</u>	<u>Toxic Manifestations</u>
Magnesium oxide fume	MgO	Solid	15	Metal fume fever (chills, fever, upper respiratory tract irritation of short duration); irritation to the eyes and nose.
Manganese and manganese compounds		Solid	6	Weakness; sleepiness; difficulty in locomotion and muscular control; exaggeration of tendon reflexes; paresis of facial muscles; mental dullness; emotional disturbances.
Mercury and mercury compounds		Liquid	0.1	Acute: abdominal pain, kidney damage, stomatitis, diarrhea, vomiting, loosening of the teeth; chronic: psychic and neurological disturbances, characterized by weakness, loss of memory, drowsiness, tremor, neurasthenia, epistaxis, stomatitis, ocular lesion, cachexia.
Pentachlorophenol	C ₆ Cl ₅ OH	Solid	0.5	Irritation of the mucous membranes of the eyes and respiratory tract; contact dermatitis with inflammation and tanning.

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TOXIC EFFECTS OF IMPORTANT INDUSTRIAL CHEMICALS

<u>Substance</u>	<u>Formula</u>	<u>Usual Physical State</u>	<u>Max. Allowable Concn. mg./cu.m.</u>	<u>Toxic Manifestations</u>
Phosphorus (yellow)	P	Solid	0.1	Burning of the skin and mucous membrane, liver damage, and bone necrosis, following inflammation of the periosteum, swelling of the gums, anemia and jaundice.
Phosphorus pentachloride	PCl ₅	Solid	1	Irritation of the mucous membranes of the nose and respiratory tract.
Phosphorus sesquisulfide	P ₄ S ₃	Solid	10	Skin irritation.
Selenium compounds		Solid	0.1	Pallor; nasal and throat irritation; garlicky odor of breath; metallic taste; nervousness; gastrointestinal disturbances.
Sulfuric acid	H ₂ SO ₄	Liquid	1.0	Irritation of the skin and mucous membrane, ranging from slight irritation through necrosis, depending on concentration and time of contact; severe damage of the lungs; corrosion of the teeth.

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TOXIC EFFECTS OF IMPORTANT INDUSTRIAL CHEMICALS

<u>Substance</u>	<u>Formula</u>	<u>Usual Physical State</u>	<u>Max. Allowable Concn. mg./cu.m.</u>	<u>Toxic Manifestations</u>
Tellurium compounds		Solid	0.1	Garlicky odor of breath; gastrointestinal disturbances; central nervous system depression.
Tetryl(N-methyl-N,2,4,6-tetranitroaniline)	$(\text{NO}_2)_3\text{C}_6\text{H}_2\text{N}(\text{NO}_2)\text{CH}_3$	Solid	1.5	Contact dermatitis; nasal irritation; epistaxis; staining of the skin and hair.
2,4,6-Trinitrotoluene	$\text{CH}_3\text{C}_6\text{H}_2(\text{NO}_2)_3$	Solid	1.5	Dermatitis; cyanosis; methemoglobin formation; dyspnea; gastritis; anemia; jaundice; liver damage; vasomotor changes; bone marrow depression.
Zinc oxide fume	ZnO	Solid	15	Fever, chills; muscular pain; nausea of short duration.

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(Review furniture left to right from door of room, then review furniture from left top to bottom then right top to bottom)

DATE OF REVIEW: 3-30-95

LOCATION OF BUILDING:

Austin R & D

FLOOR OF BUILDING:

1st.

NAME OF DEPARTMENT:

Detergents & Surfactants

ROOM/OFFICE:

Storage 1267

FURNITURE NUMBER AND DESCRIPTION:

Cabinet B

DRAWER NUMBER:

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