

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp.Gr, flammability	VP, FRZ UEL, LEL		
Ethanolamine NH ₂ CH ₂ CH ₂ OH 141-43-5 KJ5775000	2-Aminoethanol, beta-Aminoethyl alcohol, Ethylamine, 2-Hydroxyethylamine, Monoethanolamine	NIOSH/OSHA 3 ppm (8 mg/m ³) ST 6 ppm (15 mg/m ³)	1000 ppm	Colorless, viscous liquid or solid (below 51°F) with an unpleasant, ammonia-like odor	MW: 61.1 BP: 339°F Sol: Miscible Fl.P: 185°F IP: 8.96 eV	VP: 0.4 mm FRZ: 51°F UEL: ? LEL: ?	Strong oxidizers, strong acids	Si gel; Methanol/ Water; GC/FID; III [#2007, Amino- ethanol Com- pounds]
2491 60	1 ppm = 2.54 mg/m ³				Sp Gr: 1.02 Class IIIA Combustible Liquid			
2-Ethoxyethanol C ₂ H ₅ OCH ₂ CH ₂ OH 110-80-5 KK8050000	Cellosolve®, EGEE, Ethylene glycol monoethyl ether	NIOSH Reduce expo- sure to lowest feasible con- centration OSHA 200 ppm (740 mg/m ³) [skin]	* [6000 ppm] *Not applicable because of the NIOSH REL	Colorless liquid with a sweet, pleasant, ether- like odor.	MW: 90.1 BP: 275°F Sol: Miscible Fl.P: 110°F IP: ?	VP: 4 mm FRZ: -130°F UEL(200°F): 15.6% LEL(200°F): 1.7%	Strong oxidizers	Char/ CH ₂ Cl ₂ ; Methanol; GC/FID, III [#1403, Alcohols IV]
1171 26	1 ppm = 3.75 mg/m ³				Sp Gr: 0.93 Class II Combustible Liquid			
2-Ethoxyethyl acetate CH ₃ COOCH ₂ CH ₂ OC ₂ H ₅ 111-15-9 KK8225000	Cellosolve® acetate, EGEEA, Ethylene glycol monoethyl ether acetate, Glycol monoethyl ether acetate	NIOSH Reduce expo- sure to lowest feasible con- centration. OSHA 100 ppm (540 mg/m ³) [skin]	* [2500 ppm] *Not applicable because of the NIOSH REL.	Colorless liquid with a mild odor.	MW: 132.2 BP: 313°F Sol: 23% Fl.P: 124°F IP: ?	VP: 2 mm FRZ: -79°F UEL: ? LEL: 1.7%	Nitrates, strong oxidizers, alkalis & acids	Char; CS ₂ ; GC/FID, III [#1450, Esters I]
1172 26	1 ppm = 5.49 mg/m ³				Sp.Gr: 0.98 Class II Combustible Liquid			
Ethyl acetate CH ₃ COOC ₂ H ₅ 141-78-6 AH5425000	Acetic ester, Acetic ether, Ethyl ester of acetic acid, Ethyl ethanoate	NIOSH/OSHA 400 ppm (1400 mg/m ³)	10,000 ppm	Colorless liquid with an ether- like, fruity odor	MW: 88.1 BP: 171°F Sol(77°F): 10% Fl.P: 24°F IP: 10.01 eV	VP: 74 mm FRZ: -117°F UEL: 11.5% LEL: 2.0%	Nitrates, strong oxidizers, alkalis & acids	Char; CS ₂ ; GC/FID; II(2) [#S49]
1173 26	1 ppm = 3.66 mg/m ³				Sp Gr: 0.90 Class IB Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Clothing Goggles Wash: Change: Remove: Provide:	Repeat Any poss Prompt contam After work if reason prob contam Prompt non-imperv contam Eyewash	NIOSH/OSHA 30 ppm: SA*/SCBA*/CCRS* 75 ppm: SA:CF*/PAPRS* 150 ppm: CCRFS/GMFS/SCBAF/SAF 1000 ppm: SAF:PD,PP §: SCBAF:PD,PP/SAF:PD,PP,ASCBA Escape: GMFS/SCBAE	Inh Ing Con	Resp sys, skin, eye irrit, lethargy	Eye Skin: Breath Swallow:	Irr immed Water flush prompt Resp support Medical attention immed	Skin, eyes, resp sys
Clothing Goggles Wash: Change: Remove:	Repeat Reason prob Prompt wet N.R Prompt non-imperv contam	NIOSH Y: SCBAF PD,PP/SAF:PD,PP,ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	In animals: pulm irrit; hematologic effects; liver, kidneys lung damage, irrit eyes	Eye: Skin: Breath: Swallow:	Irr immed Water flush prompt Resp support Medical attention immed	In animals: lungs, eyes, blood, kidneys, liver
Clothing Goggles Wash: Change: Remove:	Repeat Reason prob Prompt wet N.R. Prompt non-imperv wet	Y: SCBAF PD,PP/SAF:PD,PP,ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, vomit; kidney damage, para	Eye: Skin: Breath: Swallow:	Irr immed Water flush prompt Resp support Medical attention immed	Resp sys, eyes, GI tract
Clothing Goggles Wash: Change: Remove:	Repeat Reason prob Prompt wet N.R. Immed wet (flamm)	NIOSH/OSHA 1000 ppm: CCRFOV/PAPROV [†] 10,000 ppm: GMFOV/SCBAF/SAF/ SA:CF [†] §: SCBAF:PD,PP/SAF:PD,PP,ASCBA Escape GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat, narco; derm	Eye: Skin: Breath Swallow:	Irr immed Water flush prompt Resp support Medical attention immed	Eyes, skin, resp sys

Ethyl acetate

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp.Gr, flammability	VP, FRZ UEL, LEL		
Ethyl acrylate $\text{CH}_2=\text{CHCOOC}_2\text{H}_5$ 140-88-5 AT0700000	Ethyl acrylate (inhibited), Ethyl ester of acrylic acid, Ethyl propenoate	NIOSH Ca See Appendix A OSHA 5 ppm (20 mg/m ³) ST 25 ppm (100 mg/m ³) [skin]	Ca [2000 ppm]	Colorless liquid with an acrid odor	MW 100.1 BP 211°F Sol 2% Fl.P 48°F IP ? Sp Gr 0.92 Class IB Flammable Liquid	VP 29 mm FRZ: -96°F UEL: 14% LEL: 1.4%	Oxidizers, peroxides, polymerizers, strong alkalis, moisture, chlorosulfonic acid [Note Polymerizes readily unless an inhibitor such as hydroquinone is added]	Char; CS ₂ ; GC/FID, III [#1450, Esters I]
1917 27	1 ppm = 4.16 mg/m ³							
Ethylamine $\text{CH}_3\text{CH}_2\text{NH}_2$ 75-04-7 KH2100000	Aminoethane, Ethylamine (anhydrous), Monoethylamine	NIOSH/OSHA 10 ppm (18 mg/m ³)	4000 ppm	Colorless gas or water-white liquid (below 62°F) with an ammonia-like odor [Note. Shipped as a liquefied compressed gas.]	MW 45.1 BP 62°F Sol: Miscible Fl P, 1°F IP 8.86 eV Sp Gr 0.69 (Liquid) Flammable Gas Class IA Flammable Liquid	VP: >1 atm FRZ: -114°F UEL: 14.0% LEL: 3.5%	Strong acids, strong oxidizers, copper, tin & zinc in presence of moisture, cellulose nitrate	Si gel, H ₂ SO ₄ , GC/FID II(3) [#S144]
1036 68	1 ppm = 1.87 mg/m ³							
Ethyl benzene $\text{CH}_3\text{CH}_2\text{C}_6\text{H}_5$ 100 41-4 DA0700000	Ethylbenzol, Phenylethane	NIOSH/OSHA 100 ppm (435 mg/m ³) ST 125 ppm (545 mg/m ³)	2000 ppm	Colorless liquid with an aromatic odor.	MW 106.2 BP 277°F Sol 0.01% Fl.P 55°F IP 8.76 eV Sp.Gr: 0.87 Class IB Flammable Liquid	VP(79°F): 10 mm FRZ: -139°F UEL: 6.7% LEL: 1.0%	Strong oxidizers	Char; CS ₂ ; GC/FID; III [#1501, Aromatic Hydro- carbons]
1175 26	1 ppm = 4.41 mg/m ³							
Ethyl bromide $\text{CH}_3\text{CH}_2\text{Br}$ 74-96-4 KH6475000	Bromoethane	NIOSH See Appendix D OSHA 200 ppm (890 mg/m ³) ST 250 ppm (1110 mg/m ³)	3500 ppm	Colorless to yellow liquid with an ether-like odor. [Note: A gas above 101°F.]	MW: 109.0 BP 101°F Sol 0.9% Fl P: <4°F IP: 10.29 eV Sp.Gr: 1.46 Class IB Flammable Liquid	VP(70°F): 400 mm FRZ: -182°F UEL: 8.0% LEL: 6.8%	Chemically-active metals such as sodium, potassium, calcium, powdered aluminum, zinc & magnesium	Char, 2-Propanol; GC/FID; III [#1011]
1891 58	1 ppm = 4.53 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Clothing: Repeat Goggles: Reason prob Wash: Prompt wet Change: N.R. Remove: Immed wet (flamm)		NIOSH §. SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, resp sys, skin; [carc]	Eye: Skin: Breath: Swallow:	Irr immed Water flush immed Resp support Medical attention immed	Resp sys, eyes, skin
Clothing: Reason prob Goggles: Any poss Wash: Immed contam Change: N.R. Remove: Immed wet/immed non-imperv contam Provide: Eyewash, quick drench		NIOSH/OSHA 250 ppm SA:CF ^e /PAPRS ^c 500 ppm. CCRFS/GMFS/SCBAF/SAF 4000 ppm. SAF PD,PP §: SCBAF PD,PP/SAF PD,PP ASCBA Escape. GMFS/SCBAE	Inh Abs Ing Con	Irrit eyes, burns skin, resp irrit, derm	Eye: Skin: Breath: Swallow:	Irr immed Water flush immed Resp support Medical attention immed	Resp sys, eyes, skin
Clothing: Repeat Goggles: Reason prob Wash: Prompt contam Change: N.R. Remove: Immed wet (flamm)		NIOSH/OSHA 1000 ppm: PAPROV*/SA*/SCBA*/ CCROV* 2000 ppm: GMFOV/SCBAF/SAF §: SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, muc memb, head; derm, narco, coma	Eye: Skin: Breath: Swallow	Irr immed Water flush prompt Resp support Medical attention immed	Eyes, upper resp sys, skin, CNS
Clothing: Repeat Goggles: Reason prob Wash: Prompt wet Change: N.R. Remove: Immed wet (flamm)		OSHA 2000 ppm. SA/SCBA 3500 ppm: SA CF/SCBAF/SAF §: SCBAF PD,PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, resp sys, skin, CNS depres; pulm edema; liver, kidney disease, card arrhy; card arrest	Eye: Skin: Breath: Swallow	Irr immed Soap flush prompt Resp support Medical attention immed	Skin, liver, kidneys, resp sys, CVS, CNS

Ethyl bromide

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp.Gr, flammability	VP, FRZ UEL, LEL		
Ethyl butyl ketone <chem>CH3CH2CO(CH2)3CH3</chem> 106-35-4 MJ5250000	Butyl ethyl ketone, 3-Heptanone	NIOSH/OSHA 50 ppm (230 mg/m ³)	3000 ppm	Colorless liquid with a powerful, fruity odor	MW: 114.2 BP 298°F Sol 1% Fl P(oc) 115°F IP: 9.02 eV	VP 4 mm FRZ: -38°F UEL: ? LEL: ?	Oxidizers, acetaldehyde, perchloric acid	Char, Methanol/ CS ₂ , GC/FID, III [#1301, Ketones II]
	1 ppm = 4.75 mg/m ³				Sp Gr: 0.82 Class II Combustible Liquid			
Ethyl chloride <chem>CH3CH2Cl</chem> 75-00-3 KH7525000	Chloroethane, Hydrochloric ether, Monochloroethane, Muriatic ether	NIOSH See Appendix D Handle with caution in the workplace. OSHA 1000 ppm (2600 mg/m ³)	20,000 ppm	Colorless gas or liquid (below 54°F) with a pungent, ether- like odor [Note: Shipped as a liquefied compressed gas.]	MW: 64.5 BP 54°F Sol: 0.6% Fl P NA (Gas) IP: 10.97 eV	VP: >1 atm FRZ: -218°F UEL 15.4% LEL 3.8%	Chemically-active metals such as sodium, potassium, calcium, powdered aluminum, zinc & magnesium, oxidizers, water or steam [Note: Reacts with water to form hydrochloric acid]	Char(2), CS ₂ , GC/FID, III [#2519]
1037 27	1 ppm = 2.68 mg/m ³				Sp.Gr: 0.92 (Liquid at 32°F) Flammable Gas Class IA Flammable Liquid			
Ethylene chlorohydrin <chem>CH2ClCH2OH</chem> 107-07-3 KK0875000	2-Chloroethanol, 2-Chloroethyl alcohol, Ethylene chlorhydrin	NIOSH/OSHA C 1 ppm (3 mg/m ³) [skin]	10 ppm	Colorless liquid with a faint, ether-like odor.	MW: 80.5 BP 262°F Sol: Miscible Fl P 140°F IP: 10.90 eV	VP: 5 mm FRZ: -90°F UEL: 15.9% LEL: 4.9%	Strong oxidizers, strong caustics, water or steam	Char(pet); 2-Propanol/ CS ₂ , GC/FID, III [#2513]
1135 55	1 ppm = 3.35 mg/m ³				Sp Gr 1.20 Class IIIA Combustible Liquid			
Ethylenediamine <chem>NH2CH2CH2NH2</chem> 107-15-3 KH8575000	1,2-Diaminoethane, 1,2-Ethanediamine; Ethylenediamine (anhydrous)	NIOSH/OSHA 10 ppm (25 mg/m ³)	2000 ppm	Colorless, viscous liquid with an ammonia-like odor. [Note: A solid below 47°F.] [fungicide]	MW: 60.1 BP 241°F Sol. Miscible Fl P 93°F IP 8.60 eV	VP: 11 mm FRZ: 47°F UEL: 14.4% LEL: 4.2%	Strong acids & oxidizers, carbon tetrachloride & other chlorinated organic compounds, carbon disulfide [Note Corrosive to metals]	XAD-2*; DMF; HPLC/UVD; III [#2540]
1604 29	1 ppm = 2.50 mg/m ³				Sp Gr. 0.91 Class IC Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Clothing Goggles Wash Change Remove	Repeat Reason prob Prompt contam N R Prompt non-imperv contam	NIOSH/OSHA 500 ppm: CCROV*/SA*/SCBA* 1000 ppm: PAPROV*/CCRFOV 1250 ppm: SA,CF* 2500 ppm: GMFOV/SCBAF/SAF 3000 ppm: SAF-PD,PP § SCBAF-PD,PP/SAF-PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, muc memb. head; narco, coma; derm	Eye: Skin: Breath: Swallow	Irr immed Water flush Resp support Medical attention immed	Eyes, skin, resp sys
Clothing Goggles Wash Change Remove	Repeat Reason prob N.R N.R Immed wet (flamm)	OSHA 10,000 ppm: SA*/SCBA* 20,000 ppm: SA,CF*/SCBAF/SAF § SCBAF-PD,PP/SAF-PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Inco, inebriate, abdom cramps; card arrhy, card arrest; liver, kidney damage	Eye: Skin: Breath: Swallow	Irr immed Water flush prompt Resp support Medical attention immed	Liver, kidneys, resp sys, CVS
Clothing Goggles Wash Change Remove Provide	Any poss Any poss Immed contam N.R. Immed non-imperv contam Eyewash, quick drench	NIOSH/OSHA 10 ppm: SCBA*/SA* § SCBAF-PD,PP/SAF-PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit muc memb, nau, vomit; verti, inco, numb; vis dist, head; thirst; delirium; low BP, collapse, shock, coma	Eye: Skin: Breath: Swallow	Irr immed Water flush immed Resp support Medical attention immed	Resp sys, liver, kidneys, CNS, skin, CVS
Clothing Goggles Wash Change Remove Provide	Any poss Any poss Immed contam/daily After work if any poss contam Immed wet/Immed non-imperv contam Eyewash (>5%) quick drench	NIOSH/OSHA 250 ppm: SA,CF*/PAPRS* 500 ppm: CCRFS/GMFS/SCBAF/SAF 2000 ppm: SAF-PD,PP § SCBAF-PD,PP/SAF-PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Abs Ing Con	Nasal irrit, primary irrit; se.is derm, irrit resp sys, asthma, liver, kidney damage	Eye: Skin: Breath: Swallow	Irr immed Water flush immed Resp support Medical attention immed	Resp sys, liver, kidneys, skin

Ethylenediamine

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL, Fl.P, IP, Sp.Gr, flammability	VP, FRZ, UEL, LEL		
Ethylene dibromide BrCH ₂ CH ₂ Br 106-93-4 KH9275000	1,2-Dibromoethane, Ethylene bromide; Glycol dibromide	NIOSH Ca See Appendix A 0.045 ppm C 0.13 ppm [15-min] OSHA 20 ppm C 30 ppm 50 ppm [5-min max peak]	Ca [400 ppm]	Colorless liquid or solid (below 50°F) with a sweet odor	MW: 187.9 BP: 268°F Sol: 0.4% Fl.P: NA IP: 9.45 eV	VP: 12 mm FRZ: 50°F UEL: NA LEL: NA	Chemically-active metals such as sodium, potassium, calcium, hot aluminum & magnesium, liquid ammonia; strong oxidizers	Char, Benzene/ Methanol; GC/ECD, III [#1008]
1605 55	1 ppm = 7.81 mg/m ³				Sp Gr: 2.17 Noncombustible Liquid			
Ethylene dichloride ClCH ₂ CH ₂ Cl 107-06-2 KI0525000	1,2-Dichloroethane; Ethylene chloride, Glycol dichloride	NIOSH Ca See Appendix A 1 ppm (4 mg/m ³) ST 2 ppm (8 mg/m ³) OSHA 1 ppm (4 mg/m ³) ST 2 ppm (8 mg/m ³)	Ca [1000 ppm]	Colorless liquid with a pleasant, chloroform-like odor. [Note: Decomposes slowly, becomes acidic & darkens in color.]	MW: 99.0 BP: 182°F Sol: 0.9% Fl.P: 56°F IP: 11.05 eV	VP: 64 mm FRZ: -32°F UEL: 16% LEL: 6.2%	Strong oxidizers & caustics; chemically-active metals such as aluminum or magnesium powder, sodium & potassium, liquid ammonia [Note: Decomposes to vinyl chloride & HCl above 1112°F.]	Char; CS ₂ ; GC/FID; III [#1003, Halogenated Hydrocarbons]
1184 26	1 ppm = 4.11 mg/m ³				Sp Gr: 1.24 Class IB Flammable Liquid			
Ethylene glycol dinitrate O ₂ NOCH ₂ CH ₂ ONO ₂ 628-96-6 KW5600000	EGDN; 1,2-Ethanediol dinitrate, Ethylene dinitrate, Ethylene nitrate; Glycol dinitrate; Nitroglycol	NIOSH/OSHA ST 0.1 mg/m ³ [skin] [Note: OSHA stayed the start-up date of the PEL on 12/6/89 for the explosives industry until 2/1/90.]	500 mg/m ³	Colorless to yellow, oily, odorless liquid [Note: An explosive ingredient (60-80%) in dynamite along with nitroglycerine (40-20%).]	MW: 152.1 BP: 387°F Sol: Insoluble Fl.P: 419°F IP: ?	VP: 0.05 mm FRZ: -8°F UEL: ? LEL: ?	Acids, alkalis	Tenax GC; Ethanol; GC/ECD; III [#2507]
1 ppm = 6.12 mg/m ³					Sp. Gr: 1.49 Explosive Liquid			
Ethyleneimine C ₂ H ₅ N 151-56-4 KX5075000	Aminoethylene, Azirane, Aziridine, Dimethyleneimine, Dimethylenimine, Ethyleneimine, Ethylimine	NIOSH Ca See Appendix A OSHA [1910.1012] See Appendix B	Ca [100 ppm]	Colorless liquid with an ammonia-like odor.	MW: 43.1 BP: 133°F Sol: Miscible Fl.P: 12°F IP: 9.20 eV	VP: 160 mm FRZ: -97°F UEL: 46% LEL: 3.6%	Polymerizes explosively in presence of acids [Note: Explosive silver derivatives may be formed with silver alloys (e.g., silver solder).]	Bub, CHCl ₃ , HPLC/UVD; II(5) [P&CAM #300]
1185 30 (inhibited)	1 ppm = 1.79 mg/m ³				Sp Gr: 0.83 Class IB Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Clothing: Repeat Goggles: Reason prob Wash: Immed contam Change: N R. Remove: Immed non-imperv contam Provide: Quick drench	NIOSH Y: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit resp sys, eyes, derm with vesic, [carc]	Eye: Skin: Breath. Swallow.	Irr immed Soap wash immed Resp support Medical attention immed	Resp sys, liver, kidneys, skin, eyes	
Clothing: Repeat Goggles: Reason prob Wash: Prompt contam Change: N R. Remove: Immed wet (flamm)	NIOSH Y: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Abs Con	CNS depres, nau, vomit; derm; irrit eyes, corneal opacity, [carc]	Eye: Skin: Breath. Swallow.	Irr immed Soap wash prompt Resp support Medical attention immed	Kidneys, liver, eyes, skin, CNS	
Clothing: Any poss Goggles: Reason prob Wash: Immed contam Change: After work if any poss contam Remove: Immed wet (flamm) Provide: Quick drench	NIOSH/OSHA 1 mg/m ³ : SA*/SCBA* 2.5 mg/m ³ : SA:CF* 5 mg/m ³ : SCBAF/SAF/SAT:CF* 200 mg/m ³ : SAF:PD,PP § SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOVHiE/SCBAE	Inh Abs Ing Con	Throb head: dizz; nau, vomit, abdom pain; hypotension, flush; palp; methemoglobinemia; delirium, depres CNS; angina, skin irrit; in animals anemia; mild liver, kidney damage	Eye: Skin: Breath: Swallow.	Irr immed Soap wash immed Resp support Medical attention immed	CVS, blood skin	
Clothing: Any poss Goggles: Any poss Wash: Immed contam/daily Change: After work if any poss contam Remove: Immed contam Provide: Eyewash, quick drench	NIOSH Y: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Con Ing	Nau, vomit, head, dizz, pulm edema, liver, kidney damage; eye burns; skin sens, irrit nose, throat; [carc]	Eye: Skin: Breath. Swallow.	Irr immed (15 min) Soap wash immed Resp support Medical attention immed	Eyes, lungs, skin, liver, kidneys	

Ethyleneimine

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P. IP, Sp.Gr. flammability	VP, FRZ UEL, LEL		
Ethylene oxide C_2H_4O 75-21-8 KX2450000	Dimethylene oxide; 1,2-Epoxy ethane; Oxirane	NIOSH Ca See Appendix A <0.1 ppm (0.18 mg/m ³) C 5 ppm (9 mg/m ³)[10-min/day] OSHA [1910.1047] ACGIH 1 ppm A2 5 ppm [15-min Excursion]	Ca [800 ppm]	Colorless gas or liquid (below 51°F) with an ether-like odor	MW: 44.1 BP: 51°F Sol: Miscible Fl.P(oc) -20°F IP: 10.56 eV	VP: >1 atm FRZ: -171°F UEL: 100% LEL: 3.0%	Strong acids, alkalis & oxidizers; chlorides of iron, aluminum & tin; oxides of iron & aluminum	Char(pet)*, DMF, GC/ECD, III [#1614]
1040 69	1 ppm = 1.83 mg/m ³				Sp Gr: 0.82 (Liquid at 50°F) Class IA Flammable Liquid			
Ethyl ether $C_2H_5OC_2H_5$ 60-29-7 KI5775000	Diethyl ether, Ethyl oxide, Ether, Diethyl oxide, Solvent ether	NIOSH See Appendix D OSHA 400 ppm (1200 mg/m ³) ST 500 ppm (1500 mg/m ³)	19,000 ppm [LEL]	Colorless liquid with a pungent, sweetish odor. [Note: A gas above 84°F.]	MW: 74.1 BP: 94°F Sol: 8% Fl.P: -49°F IP: 9.53 eV	VP: 440 mm FRZ: -177°F UEL: 36.0% LEL: 1.9%	Strong oxidizers [Note: Tends to form explosive peroxides under influence of air & light.]	Char; Ethyl acetate; GC/FID, III [#1610]
1155 26	1 ppm = 3.08 mg/m ³				Sp Gr: 0.71 Class IA Flammable Liquid			
Ethyl formate CH_3CH_2OCHO 109-94-4 LQ8400000	Ethyl ester of formic acid, Ethyl methanoate	NIOSH/OSHA 100 ppm (300 mg/m ³)	8000 ppm	Colorless liquid with a fruity odor	MW: 74.1 BP: 130°F Sol(64°F): 9% Fl.P: -4°F IP: 10.61 eV	VP: 200 mm FRZ: -113°F UEL: 16.0% LEL: 2.8%	Nitrates, strong oxidizers, alkalis & acids [Note: Decomposes slowly in water to form ethyl alcohol & formic acid.]	Char, CS ₂ , GC/FID; II(2) [#S36]
1190 26	1 ppm = 3.08 mg/m ³				Sp.Gr. 0.92 Class IB Flammable Liquid			
Ethyl mercaptan CH_3CH_2SH 75-08-1 K19625000	Ethanethiol, Ethyl sulfhydrate, Mercaptoethane	NIOSH C 0.5 ppm (1.3 mg/m ³) [15-min] OSHA 0.5 ppm (1 mg/m ³)	2500 ppm	Colorless liquid with a strong skunk-like odor. [Note: A gas above 95°F.]	MW: 62.1 BP: 95°F Sol: 0.7% Fl.P: -55°F IP: 9.29 eV	VP: 442 mm FRZ: -228°F UEL: 18.0% LEL: 2.8%	Strong oxidizers [Note: Reacts violently with calcium hypochlorite.]	None available
2363 27	1 ppm = 2.58 mg/m ³				Sp.Gr: 0.84 Class IA Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Clothing: Any poss Goggles: Reason prob Wash: Immed contam Change: N.R Remove: Immed wet (flamm) Provide: Eyewash		NIOSH 5 ppm: GMFS ¹ /SCBAF/SAF §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFS ¹ /SCBAE	Inh Ing Con	Irrit eyes, nose, throat; peculiar taste; head; nau, vomit, diarr; dysp, cyan, pulm edema; drow, weak, inco; EKG abnormalities; burns eyes, skin, frostbite; [carc]; in animals: convuls; liver, kidney damage	Eye: Skin: Breath: Swallow	Irr immed Water flush immed Resp support Medical attention immed	Eyes, blood, resp sys, liver, CNS, kidneys
Clothing: Repeat Goggles: Reason prob Wash: N.R. Change: N.R Remove: Immed wet (flamm)		OSHA 1000 ppm: CCROV ¹ /PAPROV ⁴ 4000 ppm: SA ¹ /SCBA ¹ 10,000 ppm: SA:CF ¹ 19,000 ppm: GMFOV/SCBAF/SAF §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Dizz; drow, head, excited, narco, nau, vomit; irrit eyes, upper resp sys, skin	Eye: Skin: Breath: Swallow.	Irr immed Water wash prompt Resp support Medical attention immed	CNS, skin, resp sys, eyes
Clothing: Repeat Goggles: Reason prob Wash: Prompt wet Change: N.R Remove: Any wet immed (flamm)		NIOSH/OSHA 1000 ppm: CCRFOV/PAPROV ⁴ 2500 ppm: SA:CF ¹ 5000 ppm: GMFOV/SCBAF/SAF 8000 ppm: SAF:PD,PP §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, upper resp sys, narco	Eye: Skin: Breath: Swallow:	Irr immed Water flush immed Resp support Medical attention immed	Eyes, resp sys
Clothing: Repeat Goggles: Reason prob Wash: Prompt contam Change: N.R. Remove: Immed wet (flamm)		NIOSH/OSHA 5 ppm: SA/SCBA/CCROV 12.5 ppm: SA:CF/PAPROV 25 ppm: SCBAF/SAF/GMFOV/PAPRTOV/ CCRFOV/SAT:CF 500 ppm: SA:PD,PP 1000 ppm: SAF:PD,PP §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Head, nau, irrit muc memb, in animals, inco; weak; pulm irrit; liver, kidney damage; cyan	Eye: Skin: Breath: Swallow:	Irr immed Soap wash immed Resp support Medical attention immed	Resp sys, in animals liver, kidneys

Ethyl mercaptan

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp.Gr, flammability	VP, FRZ UEL, LEL		
N-Ethylmorpholine $C_4H_9ONCH_2CH_3$ 100-74-3 QE4025000	4-Ethylmorpholine	NIOSH/OSHA 5 ppm (23 mg/m ³) [skin]	2000 ppm	Colorless liquid with an ammonia- like odor	MW: 115.2 BP: 281°F Sol Miscible Fl P (oc) 90°F IP: ?	VP: 6 mm FRZ: -81°F UEL: ? LEL: ?	Strong acids, strong oxidizers	Si gel; H ₂ SO ₄ ; GC/FID; II(3) [#S146]
	1 ppm = 4.79 mg/m ³				Sp Gr 0.90 Class IC Flammable Liquid			
Ethyl silicate $(C_2H_5)_4SiO_4$ 78-10-4 VV9450000	Ethyl orthosilicate, Ethyl silicate (condensed), Tetraethoxysilane, Tetraethyl silicate	NIOSH/OSHA 10 ppm (85 mg/m ³)	1000 ppm	Colorless liquid with a sharp, alcohol-like odor.	MW: 208.3 BP: 336°F Sol Reacts Fl P: 99°F IP: 9.77 eV	VP: 1 mm FRZ: -117°F UEL: ? LEL: ?	Strong oxidizers, water [Note: Reacts with water to form a silicone adhesive (a milky-white mass).]	XAD-2; CS ₂ ; GC/FID; II(3) [#S264]
1292 29	1 ppm = 8.66 mg/m ³				Sp.Gr: 0.93 Class IC Flammable Liquid			
Ferbam $((CH_3)_2NCS_2)_3Fe$ 14484-64-1 NO8750000	tris(Dimethyldithio- carbamate)iron, Ferric dimethyl dithio- carbamate	NIOSH/OSHA 10 mg/m ³	N.E.	Dark brown to black, odorless solid. [fungicide]	MW: 416.5 BP: Decomposes Sol: 0.01% Fl.P: ? IP: 7.72 eV	VP: Low MLT: >356°F (Decomposes) UEL: ? LEL: ?	Strong oxidizers	None available
					Combustible Solid			
Ferrovandium dust FeV 12804-58-9 LK2900000	None	NIOSH/OSHA 1 mg/m ³ ST 3 mg/m ³	N.E.	Dark, odorless particulate dispersed in air. [Note: Ferro- vanadium metal is an alloy usu- ally containing 50-80% vana- dium.]	MW: 106.8 BP: ? Sol: Insoluble Fl.P: NA IP: NA	VP: 0 mm (approx) MLT 2696 to 2768°F UEL: NA LEL: NA	Strong oxidizers	Filter; Acid; AA, OSHA [#ID121, #ID125G]
					Noncombustible Solid, but dust may be an explosion hazard.			

Personal protection and sanitation (See Table 3)	Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
		Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Clothing: Repeat Goggles: Any poss Wash: Prompt contam Change: N.R. Remove: Immed wet (flamm) Provide: Eyewash (>15%), quick drench	NIOSH/OSHA 50 ppm: SA*/SCBA*/CCROV* 125 ppm: SA:CF*/PAPROV* 250 ppm: SCBAF/SAF/CCRFOV/ GMFOV/PAPRTOV*/SAT:CF* 2000 ppm: SAF:PD,PP §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Eye, nose, throat irrit; vis dist; severe eye irrit from splashes	Eye: Skin: Breath: Swallow:	Irr immed Water flush prompt Resp support Medical attention immed	Resp sys, eyes, skin
Clothing: Repeat Goggles: Reason prob Wash: Prompt wet Change: N.R. Remove: Immed wet (flamm)	NIOSH/OSHA 100 ppm: SA*/SCBA* 250 ppm: SA:CF* 500 ppm: SCBAF/SAF 1000 ppm: SAF:PD,PP §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose; in animals: lac; dysp, pulm edema; tremor, narco; liver, kidney damage; anemia	Eye: Skin: Breath: Swallow:	Irr immed Soap wash prompt Resp support Medical attention immed	Resp sys, liver, kidneys, blood, skin
Clothing: Repeat Goggles: Reason prob Wash: Prompt contam Change: After work if reason prob contam Remove: Prompt non-imperv contam	NIOSH/OSHA 50 mg/m ³ : D 100 mg/m ³ : DXSQ*/SA*/SCBA*/HiE* 250 mg/m ³ : PAPRD*/SA:CF* 500 mg/m ³ : HiEF/SCBAF/SAF/ PAPRTHiE*/SAT:CF* 5000 mg/m ³ : SAF:PD,PP §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Irrit eyes, resp tract; derm; GI dist	Eye: Skin: Breath: Swallow:	Irr immed Soap wash prompt Resp support Medical attention immed	Resp sys, skin, GI tract
Clothing: N.R. Goggles: N.R. Wash: N.R. Change: N.R. Remove: N.R.	NIOSH/OSHA 5 mg/m ³ : DM* 10 mg/m ³ : D XSQ*/SA*/SCBA* 25 mg/m ³ : PAPRDM*/SA:CF* 50 mg/m ³ : HiEF/SCBAF/SAF/ PAPRTHiE*/SAT:CF* 500 mg/m ³ : SAF:PD,PP §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Con	Irrit eyes, resp sys; in animals: bron, pneumitis	Eye: Breath:	Irr immed Resp support	Resp sys, eyes

Ferrovandium dust

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P., IP, Sp.Gr, flammability	VP, FRZ UEL, LEL		
Fluorides (as F) 1 NaF 2 Na ₂ AlF ₆ 1: 7681-49-4/ WB0350000 2 15096-52-3/ WA9625000 1690 54 (NaF)	1: Sodium fluoride, Floridine 2: Cryolite, Cryocide, Cryodust, Sodium aluminum fluoride, Sodium hexafluoroaluminate Synonyms of other compounds vary depending upon the specific compound.	NIOSH/OSHA 2.5 mg/m ³	500 mg/m ³	1: Odorless white powder or colorless crystals. [Note: Pesticide grade is often dyed blue.] 2: Colorless to dark odorless solid. [Note: Loses color on heating] [pesticide]	MW: 42.0/209.9 BP: 3099°F/ Decomposes Sol: 4/0.04% Fl.P: NA/NA IP: NA/NA Sp.Gr 2.78/2.90 Noncombustible Solids	VP: 0/0 mm (approx) MLT: 1819/ 1832°F UEL: NA/NA LEL: NA/NA	Strong oxidizers	None available
Fluorine F ₂ 7782-41-4 LM6475000 9192 25 (cryogenic liquid) 1045 20 (compressed)	Fluorine-19 1 ppm = 1.58 mg/m ³	NIOSH/OSHA 0.1 ppm (0.2 mg/m ³)	25 ppm	Pale yellow to greenish gas with a pungent, irritating odor.	MW: 38.0 BP: -307°F Sol: Reacts Fl.P: NA IP: 15.70 eV	VP: >1 atm FRZ: -363°F UEL: NA LEL: NA	Water, nitric acid, oxidizers, organic compounds [Note: Reacts violently with all combustible materials, except the metal containers in which it is shipped. Reacts with H ₂ O to form hydrofluoric acid.]	None available
Fluorotrichloromethane CCl ₃ F 75-69-4 PB6125000 1078 12 (gas)	Freon® 11, Monofluorotrichloromethane, Trichlorofluoromethane, Trichloromonofluoromethane, Refrigerant 11 1 ppm = 5.71 mg/m ³	NIOSH/OSHA C 1000 ppm (5600 mg/m ³)	10,000 ppm	Colorless to water-white, nearly odorless liquid or gas (above 75°F).	MW: 137.4 BP: 75°F Sol(77°F): 0.1% Fl.P: NA IP: 11.77 eV Sp.Gr 1.47 (Liquid at 75°F) Noncombustible Liquid	VP: 690 mm FRZ: -168°F UEL: NA LEL: NA	Chemically-active metals such as sodium, potassium, calcium, powdered aluminum, zinc, magnesium & lithium shavings, granular barium	Char; CS ₂ ; GC/FID; III [#1006, Trichlorofluoromethane]
Formaldehyde HCHO 50-00-0 LP8925000 1198 29 (formalin) 2209 29 (formalin)	1) Gaseous form: Methanal, Methyl aldehyde, Methylene oxide 2) Aqueous solution: Formalin (30 to 50% formaldehyde by weight, which usually contains 6 to 12% methanol)	NIOSH Ca See Appendix A 0.016 ppm C 0.1 ppm (15-min) OSHA [1910.1048] 1 ppm ST 2 ppm	Ca [30 ppm] ACGIH A2	Nearly colorless gas with a pungent, suffocating odor. [Note: Often used in an aqueous solution.]	MW: 30.0 BP: -6/207 to 214°F Sol: Miscible Fl.P: NA(Gas)/140-185°F IP: 10.88 eV/? Sp.Gr(77°F): 1.08-1.10 (Formalin) Flammable Gas Class IIIB Combustible Liquid (Formalin)	VP: >1 atm/1 mm FRZ: -134°F/? UEL: 73%/? LEL: 7.0%/?	Strong oxidizers, alkalis & acids, phenols; urea [Note: Pure formaldehyde has a tendency to polymerize]	Filter/Imp(2); none, Vis; III [#3500] [Note: Also XAD-2*, Toluene; GC/FID; #2541]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards			
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)
Clothing: Repeat Goggles: Any poss Wash: Prompt contam Change: After work if any poss contam Remove: Promptly non-imperv contam	NIOSH/OSHA 12.5 mg/m ³ . DM 25 mg/m ³ . DMXSO*/SA*/SCBA* 62.5 mg/m ³ . PAPRDM*1/SA*CF* 125 mg/m ³ . SCBAF/SAF/HiEF† 500 mg/m ³ . SAF:PD,PP § SCBAF PD,PP/SAF.PD,PP:ASCBA Escape HiEF†/SCBAE	Inh Ing Con	Irrit eyes, resp sys, nau, abdom pain, diarr; excess saliv, thirst, sweat; stiff spine, derm; calcification of ligaments of ribs, pelvis	Eye: Skin: Breath: Swallow:	Irr immed Soap wash prompt Fresh air, art resp Medical attention immed	Eyes, resp sys, CNS, skeleton, kidneys, skin
†Note: May need acid gas sorbent						
Clothing: Any poss Goggles: Any poss Wash: Immed contam Change: N.R. Remove: Immed non-imperv contam Provide: Eyewash, quick drench	NIOSH/OSHA 1 ppm: SA*/SCBA* 2.5 ppm: SA:CF* 5 ppm: SCBAF/SAF 25 ppm: SAF:PD,PP §: SCBAF:PD,PP/SAF:PD,PP ASCBA Escape GMFS*/SCBAE	Inh Con	Irrit eyes, nose, resp tract, lar spasm, bron spasm; pulm edema; eyes, skin burns; in animals liver, kidney damage	Eye: Skin: Breath:	Irr immed Water flush immed Resp support	Resp sys, eyes, skin; in animals liver, kidneys
Clothing: Repeat Goggles: Any poss Wash: N.R. Change: N.R. Remove: Prompt non-imperv wet Provide: Eyewash, quick drench	NIOSH/OSHA 10,000 ppm: SA/SCBA §: SCBAF.PD,PP/SAF.PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Inco, tremors; derm, frostbite; card arrhy, card arrest	Eye: Skin: Breath: Swallow:	Irr immed Water flush immed Resp support Medical attention immed	CVS, skin
Clothing: Reason prob Goggles: Any poss Wash: Immed contam Change: N.R. Remove: Immed non-imperv contam Provide: Eyewash, quick drench	NIOSH Y SCBAF PD,PP/SAF PD,PP:ASCBA Escape: GMFS/SCBAE	Inh Ing Con	Irrit eyes, nose, throat, lac, burns nose, cough; bron spasm, pulm irrit; derm: (carc)	Eye: Skin: Breath: Swallow:	Irr immed Water flush prompt Resp support Medical attention immed	Resp sys, eyes, skin

Formaldehyde

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp.Gr, flammability	VP, FRZ UEL, LEL		
Formic acid HCOOH 64-18 6 LQ4900000	Formic acid, 85-95% in aqueous solution; Hydrogenecarboxylic acid, Methanoic acid	NIOSH/OSHA 5 ppm (9 mg/m ³)	30 ppm	Colorless liquid with a pungent, penetrating odor [Note: Often used in an aqueous solution. The 90% solution freezes at 20°F.]	MW: 46.0 BP: 224°F (90% soln) Sol: Miscible Fl P (oc): 122°F (90% soln) IP: 11.05 eV Sp.Gr: 1.22 (90% soln) Class IIIA Combustible Liquid	VP: 35 mm FRZ: 20°F (90% soln) UEL: 57% (90% soln) LEL: 18% (90% soln)	Strong oxidizers, strong caustics, concentrated sulfuric acid [Note: Corrosive to metals.]	Filter/ Chrom- 103 (2); Water, IC, II(5) [#S173]
1779 60	1 ppm = 1.91 mg/m ³							
Furfural C ₄ H ₃ OCHO 98-01-1 LT7000000	Fural, 2-Furfuraldehyde, 2-Furancarboxaldehyde, Furfuraldehyde	NIOSH See Appendix D OSHA 2 ppm (8 mg/m ³) [skin]	250 ppm	Colorless to amber liquid with an almond-like odor [Note: Darkens in light and air.]	MW: 96.1 BP: 323°F Sol: 8% Fl P: 140°F IP: 9.21 eV Sp Gr: 1.16 Class IIIA Combustible Liquid	VP(66°F): 1 mm FRZ: -34°F UEL: 19.3% LEL: 2.1%	Strong acids, oxidizers, strong alkalis	XAD-2*; Toluene, GC/FID; III [#2529]
1199 29	1 ppm = 3.99 mg/m ³							
Furfuryl alcohol C ₄ H ₃ OCH ₂ OH 98-00-0 LU9100000	2-Furyl-methanol, 2-Hydroxymethylfuran	NIOSH/OSHA 10 ppm (40 mg/m ³) ST 15 ppm (60 mg/m ³) [skin]	250 ppm	Amber liquid with a faint, burning odor.	MW: 98.1 BP: 338°F Sol: Miscible Fl P: 149°F IP: ? Sp.Gr: 1.13 Class IIIA Combustible Liquid	VP(89°F): 1 mm FRZ: 6°F UEL: 16.3% LEL: 1.8%	Strong oxidizers & acids [Note: Contact with organic acids may lead to polymerization.]	Porapak-Q, Acetone; GC/FID; III [#2505]
2874 55	1 ppm = 4.08 mg/m ³							
Glycidol C ₃ H ₆ O ₂ 556-52-5 UB4375000	2,3-Epoxy-1-propanol, Epoxypropyl alcohol; Hydroxymethyl ethylene oxide, 2-Hydroxymethyl oxiran, 3-Hydroxypropylene oxide	NIOSH/OSHA 25 ppm (75 mg/m ³)	500 ppm	Colorless liquid	MW: 74.1 BP: 320°F (Decomposes) Sol: Miscible Fl P: 162°F IP: ? Sp Gr: 1.12 Class IIIA Combustible Liquid	VP(77°F): 0.9 mm FRZ: -49°F UEL: ? LEL: ?	Strong oxidizers, nitrates	Char, THF, GC/FID; III [#1608]
	1 ppm = 3.08 mg/m ³							

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Clothing Goggles Wash Change Remove Provide	Any poss Any poss Immed contam N R. Immed non-imperv contam Eyewash, quick drench	NIOSH/OSHA 30 ppm. SA*/SCBA* §. SCBAF.PD,PP/SAF.PD,PP.ASCBA Escape GMFOVH/E/SCBAE	Inh Ing Con	Eye irrit, lac; nasal discharge, throat irrit, cough, dysp, nau, skin burns, derm	Eye Skin Breath Swallow	Irr immed Water flush immed Resp support Medical attention immed	Resp sys, skin, kidneys, liver, eyes
Clothing Goggles Wash Change Remove	Repeat Reason prob Prompt contam N R Prompt non-imperv contam	OSHA 20 ppm. CCROV*/SA*/SCBA* 50 ppm. SA CF*/PAPROV* 100 ppm. CCRFOV/GMFOV/SCBAF/ SAF/PAPRTOV*/SAT CF* 250 ppm. SAF.PD,PP §. SCBAF.PD,PP/SAF.PD,PP.ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, upper resp sys, head, derm	Eye Skin Breath Swallow	Irr immed Water flush prompt Resp support Medical attention immed	Eyes, resp sys, skin
Clothing Goggles Wash Change Remove Provide	Reason prob Reason prob Immed contam N.R. Immed non-imperv contam Quick drench	NIOSH/OSHA 100 ppm. PAPROV*/SCBA*/SA*/CCROV* 250 ppm. PAPRTOV*/SA CF*/CCRFOV/ GMFOV/SCBAF/SAF §. SCBAF.PD,PP/SAF.PD,PP.ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Dizz, nau, diarr; diuresis, resp, body temperature, depres; vomit. in animals. eye irrit, drow	Eye Skin Breath Swallow	Irr immed Water flush immed Resp support Medical attention immed	Resp sys
Clothing Goggles Wash Change Remove	Repeat Reason prob Prompt contam N.R. Prompt non-imperv contam	NIOSH/OSHA 250 ppm. SA*/SCBA* 500 ppm. SA CF*/SCBAF/SAF §. SCBAF.PD,PP/SAF.PD,PP.ASCBA Escape GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, throat, skin, narco	Eye Skin Breath Swallow	Irr immed Water wash prompt Resp support Medical attention immed	Eyes, skin, resp sys, CNS

Glycidol

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp.Gr, flammability	VP, FRZ UEL, LEL		
Graphite (natural) C 7782-42-5 MD9659600	Black lead, Mineral carbon, Plumbago, Silver graphite, Stove black	NIOSH/OSHA 2.5 mg/m ³ (resp)	N E.	Steel gray to black, greasy feeling, odorless solid	MW: 12.0 BP: ? Sol. insoluble Fl.P. ? IP. NA	VP: 0 mm (approx) MLT: ? UEL: ? LEL: ?	Very strong oxidizers such as fluorine, chlorine trifluoride & potassium peroxide	Filter, none; Grav. III [#0500, Nuisance Dust (total)]
Hafnium and compounds (as Hf) Hf 7440-58-6 (Metal) MG4600000 (Metal) 2545-40 (Metal powder, dry) 1326-32 (Metal powder, wet)	Metal: Cesium, Elemental hafnium Synonyms of other compounds vary depending upon the specific compound	NIOSH/OSHA 0.5 mg/m ³	Unknown	Metal: Highly lustrous, ductile, grayish solid	MW: 178.5 BP: 8316°F Sol: Insoluble Fl.P. NA IP. NA	VP: 0 mm (approx) MLT: 4041°F UEL: NA LEL: NA	Strong oxidizers, chlorine	Filter; Acid; PES; II(5) [#S194]
Heptachlor C ₁₀ H ₅ Cl ₇ 76-44-8 PC0700000 2761-55	1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene	NIOSH Ca See Appendix A 0.5 mg/m ³ [skin] OSHA 0.5 mg/m ³ [skin]	Ca [700 mg/m ³]	White to light tan crystals with a camphor-like odor [insecticide]	MW: 373.4 BP: 293°F (Decomposes) Sol: Insoluble Fl.P. NA IP: ?	VP(77°F): 0.0003 mm MLT: 203°F UEL: NA LEL: NA	Iron, rust	Chrom-102, Toluene; GC/FID, II(5) [#S287]
n-Heptane CH ₃ (CH ₂) ₅ CH ₃ 142-82-5 MI7700000 1206-27	Heptane, normal-Heptane 1 ppm = 4.17 mg/m ³	NIOSH 85 ppm (350 mg/m ³) C 440 ppm (1800 mg/m ³) [15-min] OSHA 400 ppm (1600 mg/m ³) ST 500 ppm (2000 mg/m ³)	5000 ppm	Colorless liquid with a gasoline-like odor	MW: 100.2 BP: 209°F Sol(60°F): 0.005% Fl.P. 25°F IP: 9.90 eV	VP(72°F): 40 mm FRZ: -131°F UEL: 6.7% LEL: 1.05%	Strong oxidizers	Char, CS ₂ ; GC/FID, III [#1500, Hydrocarbons]
					Sp.Gr. 2.0-2.25 Combustible Solid			
					Sp.Gr. 13.31 (Metal) Metal: Explosive in powder form (either dry or with <25% water). Finely divided powder can be ignited by static electricity or EVEN SPONTANEOUSLY			
					Sp.Gr: 1.66 Noncombustible Solid, but may be dissolved in flammable liquids			
					Sp.Gr. 0.68 Class IB Flammable Liquid			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Clothing: N R. Goggles N R. Wash: N R. Change N R. Remove N R.		NIOSH/OSHA 12.5 mg/m ³ : D 25 mg/m ³ : DXSQ/SA/SCBA 62.5 mg/m ³ : PAPRD/SA,CF 125 mg/m ³ : HIEF/PAPRTHIE/SCBAF/ SAF/SAT:CF 1250 mg/m ³ : SAF:PD,PP § SCBAF:PD,PP/SAF:PD,PP,ASCBA Escape: HIEF/SCBAE	Inh Con	Cough, dysp, black sputum, pulm func impairment, lung fib	Eye: Breath:	Irr immed Fresh air	Resp sys, CVS
Clothing: Any poss Goggles: Any poss Wash: Prompt contam/daily Change: After work if any poss contam Remove: Prompt non-imperv contam Provide: Eyewash, quick drench		NIOSH/OSHA 2.5 mg/m ³ : DM 5 mg/m ³ : DMXSQ/SA/SCBA 12.5 mg/m ³ : PAPROM*/SA:CF* 25 mg/m ³ : HIEF/PAPRTHIE*/SCBAF/ SAF/SAT:CF* 250 mg/m ³ : SAF:PD,PP § SCBAF:PD,PP/SAF:PD,PP,ASCBA Escape: HIEF/SCBAE	Inh Ing Con	In animals: irrit eyes, skin, muc memb, liver damage	Eye: Skin: Breath Swallow:	Irr immed Soap wash prompt Resp support Medical attention immed	Eyes, skin muc memb
Clothing: Reason prob Goggles: Reason prob Wash: Immed contam Change: After work if any poss contam Remove: Immed non-imperv contam Provide: Quick drench		NIOSH ¥ SCBAF:PD,PP/SAF:PD,PP,ASCBA Escape GMFOVHIE/SCBAE	Inh Abs Ing Con	In animals: tremors, convuls, liver damage, [carc]	Eye: Skin: Breath: Swallow:	Irr immed Soap wash immed Resp support Medical attention immed	In animals: CNS, liver
Clothing: Repeat Goggles: Reason prob Wash: Prompt wet Change: N R. Remove: Immed wet (flamm)		NIOSH 850 ppm: CCROV/SA/SCBA 1000 ppm: PAPROV/CCRFOV 2125 ppm: SA,CF 4250 ppm: GMFOV/SCBAF/SAF/SAT:CF 5000 ppm: SA,PD,PP § SCBAF:PD,PP/SAF:PD,PP,ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Li-head, gidd, stupor; no appetite, nau; derm; chemical pneu, unconsciousness	Eye: Skin: Breath: Swallow:	Irr immed Soap wash prompt Resp support Medical attention immed	Skin, resp sys, PNS

n-Heptane

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp.Gr, flammability	VP, FRZ UEL, LEL		
Hexachloroethane $\text{Cl}_3\text{C}\text{CCl}_3$ 67-72-1 KI4025000 9037 53	Carbon hexachloride, Perchloroethane	NIOSH Ca See Appendix A 1 ppm (10 mg/m ³) [skin] OSHA 1 ppm (10 mg/m ³) [skin]	Ca [300 ppm]	Colorless crystals with a camphor- like odor.	MW: 236.7 BP: Sublimes Sol(72°F): 0.005% Fl.P: NA IP: 11.22 eV Sp.Gr: 2.09 Noncombustible Solid	VP: 0.2 mm MLT: 368°F (Sublimes) UEL: NA LEL: NA	Alkalis; metals such as zinc, cadmium, aluminum, hot iron & mercury	Char; CS ₂ ; GC/FID, III [#1003, Haloge- nated Hydro- carbons]
Hexachloronaphthalene $\text{C}_{10}\text{H}_2\text{Cl}_6$ 1335-87-1 QJ7350000	Halowax® 1014	NIOSH/OSHA 0.2 mg/m ³ [skin]	2 mg/m ³	White to light- yellow solid with an aromatic odor	MW: 334.9 BP: 650-730°F Sol: Insoluble Fl.P: NA IP: ? Sp.Gr: 1.78 Noncombustible Solid	VP: <1 mm MLT: 279°F UEL: NA LEL: NA	Strong oxidizers	Filter, Hexane, GC/ECD, II(2) [#S100]
n-Hexane $\text{CH}_3(\text{CH}_2)_4\text{CH}_3$ 110-54-3 MN9275000 1208 27	Hexane, Hexyl hydride, Normal-hexane 1 ppm = 3.58 mg/m ³	NIOSH/OSHA 50 ppm (180 mg/m ³)	5000 ppm	Colorless liquid with a gasoline- like odor.	MW: 86.2 BP: 156°F Sol: 0.002% Fl.P: -7°F IP: 10.18 eV Sp.Gr: 0.66 Class IB Flammable Liquid	VP(77°F): 150 mm FRZ: -219°F UEL: 7.5% LEL: 1.1%	Strong oxidizers	Char, CS ₂ ; GC/FID, III [#1500, Hydro- carbons]
2-Hexanone $\text{CH}_3\text{CO}(\text{CH}_2)_3\text{CH}_3$ 591-78-6 MP1400000	Butyl methyl ketone, MBK, Methyl butyl ketone, Methyl n-butyl ketone 1 ppm = 4.17 mg/m ³	NIOSH 1 ppm (4 mg/m ³) OSHA 5 ppm (20 mg/m ³)	5000 ppm	Colorless liquid with an acetone- like odor	MW: 100.2 BP: 262°F Sol: 2% Fl.P: 77°F IP: 9.34 eV Sp.Gr: 0.81 Class IC Flammable Liquid	VP(77°F): 4 mm FRZ: -71°F UEL: 8% LEL: ?	Strong oxidizers	Char; CS ₂ ; GC/FID, III [#1300, Ketones I]

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Clothing: Repeat Goggles: N.R. Wash: Prompt contam/daily Change: After work if reason prob contam Remove: Prompt non-imperv contam	NIOSH Y: SCBAF, PD, PP/SAF PD, PP ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes; [carc]	Eye: Skin: Breath: Swallow:	Irr immed Soap wash immed Resp support Medical attention immed	Eyes	
Clothing: Any poss molt/Repeat liq sol/Reason prob fumes Goggles: Any poss molt/Reason prob liq Wash: Prompt contam/daily Change: After work if reason prob contam Remove: Immed wet molt/Prompt non-imperv contam liq	NIOSH/OSHA 2 mg/m ³ SA*/SCBA* §: SCBAF, PD, PP/SAF PD, PP ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Acne-form derm, nau, conf, jaun, coma	Eye: Skin: Breath: Swallow:	Irr immed Soap wash prompt Resp support Medical attention immed	Liver, skin	
Clothing: Repeat Goggles: Reason prob Wash: Prompt contam Change: N.R. Remove: Immed wet (flamm)	NIOSH/OSHA 500 ppm SA*/SCBA* 1250 ppm SA CF* 2500 ppm SAT/CF*/SCBAF/SAF 5000 ppm SAF PD, PP §: SCBAF, PD, PP/SAF PD, PP ASCBA Escape GMFOV/SCBAE	Inh Ing Con	LI-head, nau, head; numb extremities, musc weak, irrit eyes, nose; derm, chemical pneu, gidd	Eye: Skin: Breath: Swallow:	Irr immed Soap wash immed Resp support Medical attention immed	Skin, eyes, resp sys	
Clothing: Reason prob Goggles: Reason prob Wash: Prompt contam Change: N.R. Remove: Immed wet (flamm)	NIOSH 10 ppm SA/SCBA 25 ppm SA CF 50 ppm SCBAF/SAF/SAT/CF 2000 ppm SAF PD, PP §: SCBAF PD, PP/SAF PD, PP ASCBA Escape GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, peri neur: weak, pares, derm; head; drow	Eye: Skin: Breath: Swallow:	Irr immed Soap wash immed Resp support Medical attention immed	CNS, skin, resp sys	

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl P, IP, Sp.Gr, flammability	VP, FRZ UEL, LEL		
Hexone <chem>CH3COCH2CH(CH3)2</chem> 108-10-1 SA9275000	Isobutyl methyl ketone, Methyl isobutyl ketone, 4-Methyl 2-pentanone, MIBK	NIOSH/OSHA 50 ppm (205 mg/m ³) ST 75 ppm (300 mg/m ³)	3000 ppm	Colorless liquid with a pleasant odor.	MW: 100.2 BP: 242°F Sol: 2% Fl.P: 64°F IP: 9.30 eV	VP: 16 mm FRZ: -120°F UEL(200°F): 8.0% LEL(200°F): 1.2%	Strong oxidizers, potassium tert- butoxide	Char, CS ₂ ; GC/FID; III [#1300, Ketones I]
1245 26	1 ppm = 4.17 mg/m ³				Sp Gr: 0.80 Class IB Flammable Liquid			
sec-Hexyl acetate <chem>C8H16O2</chem> 108-84-9 SA7525000	1,3-Dimethylbutyl acetate; Methylisoamyl acetate [<chem>CH3COOCH(CH3)-</chem> <chem>CH2CH(CH3)2</chem>]	NIOSH/OSHA 50 ppm (300 mg/m ³)	4000 ppm	Colorless liquid with a mild, pleasant, fruity odor.	MW: 144.2 BP: 297°F Sol: 0.08% Fl.P: 113°F IP: ?	VP: 3 mm FRZ: -83°F UEL: ? LEL: ?	Nitrates; strong oxidizers, alkalis & acids	Char; CS ₂ ; GC/FID, III [#1450, Esters I]
1233 26	1 ppm = 5.99 mg/m ³				Sp Gr: 0.86 Class II Combustible Liquid			
Hydrazine <chem>N2H4</chem> 302-01-2 MU7175000	Diamine, Hydrazine (anhydrous), Hydrazine base	NIOSH Ca See Appendix A C 0.03 ppm (0.04 mg/m ³) [2-hr] OSHA 0.1 ppm (0.1 mg/m ³) [skin]	Ca [80 ppm] ACGIH A2	Colorless liquid with an ammonia- like odor. [Note: A solid below 36°F.]	MW: 32.1 BP: 236°F Sol: Miscible Fl.P: 99°F IP: 8.93 eV	VP: 10 mm FRZ: 36°F UEL: 98% LEL: 2.9%	Oxidizers, hydrogen peroxide, nitric acid, metallic oxides, acids [Note: Can ignite SPONTANEOUSLY on contact with oxidizers or porous materials such as earth, wood, and cloth.]	Bub, Reagent, Vis, III [#3503]
2030 59 (<64% soln) 2029 28 (>64% soln)	1 ppm = 1.33 mg/m ³				Sp.Gr: 1.01 Class IC Flammable Liquid			
Hydrogen bromide HBr 10035-10-6 MW3850000	Anhydrous hydrogen bromide; Aqueous hydrogen bromide (i.e., Hydrobromic acid)	NIOSH/OSHA C 3 ppm (10 mg/m ³)	50 ppm	Colorless gas with a sharp, irritating odor [Note: Often used in an aqueous solution.]	MW: 80.9 BP: -88°F Sol: 49% Fl.P: NA IP: 11.62 eV	VP: >1 atm FRZ: -124°F UEL: NA LEL: NA	Strong oxidizers, strong caustics, metals, moisture [Note: Hydrobromic acid is highly corrosive to metals.]	Si gel; NaHCO ₃ / Na ₂ CO ₃ ; IC, III [#7903, Inorganic Acids]
1048 15	1 ppm = 3.36 mg/m ³				Nonflammable Gas			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Clothing: Repeat Goggles: Reason prob Wash: Prompt wet Change: N.R. Remove: Immed wet (flamm)	NIOSH/OSHA 500 ppm: CCROV*/SA*/SCBA* 1000 ppm: PAPROV*/CCRFOV 1250 ppm: SA:CF* 2500 ppm: GMFOV/SCBAF/SAF/SAT:CF* 3000 ppm: SAF:PD,PP § SCBAF PD,PP/SAF,PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, muc memb; head, narco, coma, derm	Eye: Skin: Breath: Swallow:	Irr immed Water flush prompt Resp support Medical attention immed	Resp sys, eyes, skin, CNS	
Clothing: Repeat Goggles: Reason prob Wash: Prompt wet Change: N.R. Remove: Prompt non-imperv wet	NIOSH/OSHA 500 ppm: CCROV*/SA*/SCBA* 1000 ppm: PAPROV*/CCRFOV 1250 ppm: SA:CF* 2500 ppm: GMFOV/SCBAF/SAF 4000 ppm: SAF,PD,PP § SCBAF:PD,PP/SAF PD,PP ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Head, in animals: irrit eyes, nose, throat; narco	Eye: Skin: Breath: Swallow:	Irr immed Water flush prompt Resp support Medical attention immed	CNS, eyes	
Clothing: Any poss Goggles: Any poss Wash: limited contam Change: N.R. Remove: Immed wet (flamm) Provide: Eyewash, quick drench	NIOSH ¥ SCBAF:PD,PP/SAF PD,PP ASCBA Escape: SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat, temporary blindness, dizz, nau; derm; burns skin, eyes; [carc]; in animals: bron, pulm edema; liver, kidney damage; convuls	Eye: Skin: Breath: Swallow:	Irr immed Water flush immed Resp support Medical attention immed	CNS, resp sys, skin, eyes	
Clothing: Any poss Goggles: Any poss Wash: Immed contam Change: N.R. Remove: Immed non-imperv contam Provide: Eyewash, quick drench	NIOSH/OSHA 50 ppm: SA,CF [§] /PAPRAG [§] /GMFAG/ SCBAF/SAF § SCBAF:PD,PP/SAF PD,PP ASCBA Escape: GMFAG/SCBAE	Inh Ing Con	Irrit eyes, nose, throat, skin, eye burns	Eye: Skin: Breath: Swallow:	Irr immed Water flush immed Resp support Medical attention immed	Resp sys, eyes, skin	

Hydrogen bromide

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp.Gr, flammability	VP, FRZ UEL, LEL		
Hydrogen chloride HCl 7647-01-0 MW4025000	Anhydrous hydrogen chloride, Aqueous hydrogen chloride (i.e., Hydrochloric acid, Muriatic acid)	NIOSH/OSHA C 5 ppm (7 mg/m ³)	100 ppm	Colorless to slightly yellow gas with a pungent, irritating odor [Note: Often used in an aqueous solution]	MW: 36.5 BP: -121°F Sol(86°F): 67% Fl.P: NA IP: 12.74 eV	VP: >1 atm FRZ: -174°F UEL: NA LEL: NA	Metals, hydroxides, amines, alkalis [Note: Hydrochloric acid is highly corrosive to most metals.]	Si gel; NaHCO ₃ / Na ₂ CO ₃ , IC; III [#7903, Inorganic Acids]
1050 15 (anhydrous)	1 ppm = 1.52 mg/m ³				Nonflammable Gas			
Hydrogen cyanide HCN 74-90-8 MW6825000	Formonitrile, Hydrocyanic acid, Prussic acid	NIOSH/OSHA ST 4.7 ppm (5 mg/m ³) (skin)	50 ppm	Colorless or pale blue liquid or gas (above 78°F) with a bitter, almond-like odor	MW: 27.0 BP: 78°F Sol: Miscible Fl.P: 0°F IP: 13.60 eV	VP: 630 mm FRZ: 8°F UEL: 40.0% LEL: 5.6%	Amines, oxidizers, acids, sodium hydroxide, calcium hydroxide, sodium carbonate, water, caustics, ammonia [Note: Can polymerize at 122-140°F]	Filter/Bub; KOH; ISE; III [#7904, Cyanides] [Note: Also Soda lime, Water; Vis, #6010.]
1051 13 1613 57 (5% acid)	1 ppm = 1.12 mg/m ³				Sp Gr: 0.69 Class IA Flammable Liquid			
Hydrogen fluoride (as F) HF 7664-39-3 MW7875000	Anhydrous hydrogen fluoride, Aqueous hydrogen fluoride (i.e., Hydrofluoric acid), HF-A	NIOSH 3 ppm (2.5 mg/m ³) C 6 ppm 5 mg/m ³ [15-min]	30 ppm	Colorless gas or fuming liquid (below 67°F) with a strong, irritating odor. [Note: Shipped in cylinders]	MW: 20.0 BP: 67°F Sol: Miscible Fl.P: NA IP: 15.98 eV	VP: >1 atm FRZ: -118°F UEL: NA LEL: NA	Metals, water or steam [Note: Corrosive to metals. Will attack glass and concrete.]	Si gel; NaHCO ₃ / Na ₂ CO ₃ ; IC; III [#7903, Inorganic Acids]
1052 15 (anhydrous)	1 ppm = 0.83 mg/m ³	OSHA 3 ppm ST 6 ppm			Sp Gr: 1.00 (Liquid at 67°F) Nonflammable Gas			
Hydrogen peroxide H ₂ O ₂ 7722-84-1 MX0900000 2984 60 (8-20% soln) 2014 45 (20-52% soln) 2015 47 (>52% soln)	High-strength hydrogen peroxide, Hydrogen dioxide, Hydrogen peroxide (aqueous), Hydroperoxide, Peroxide	NIOSH/OSHA 1 ppm (1.4 mg/m ³)	75 ppm	Colorless liquid with a slightly sharp odor. [Note: The pure compound is a crystalline solid below 12°F Often used in an aqueous solution.]	MW: 34.0 BP: 286°F Sol: Miscible Fl.P: NA IP: 10.54 eV	VP(86°F): 5 mm FRZ: 12°F UEL: NA LEL: NA	Oxidizable materials, iron, copper, brass, bronze, chromium, zinc, lead, manganese, silver [Note: Contact with combustible material may result in SPONTANEOUS combustion.]	None available
	1 ppm = 1.41 mg/m ³				Sp.Gr: 1.39 Noncombustible Liquid, but a powerful oxidizer.			

Personal protection and sanitation (See Table 3)		Recommendations for respirator selection — maximum concentration for use (MUC) (See Table 4)	Health hazards				
			Route	Symptoms (See Table 5)	First aid (See Table 6)	Target organs (See Table 5)	
Clothing:	Any poss pH <3/Repeat pH >3	NIOSH/OSHA 50 ppm: SA*/SCBA*/CCRS* 100 ppm: SA,CF*/SCBAF/SAF/GMFS/CCRFs/PAPRS* § SCBAF,PD,PP/SAF,PD,PP:ASCBA Escape: GMFAG/SCBAE	Inh	Inflamm nose, throat, lar; cough, burns throat, choking, burns eyes, skin; derm, in animals: lar spasm, pulm edema	Eye	Irr immed Water flush immed Resp support Medical attention immed	Resp sys, skin, eyes
Goggles:	Any poss		Ing				
Wash:	Immed contam pH <3/ Prompt wet pH >3		Con				
Change:	N.R.						
Remove:	Immed non-imperv contam pH <3/Prompt non-imperv wet pH <3: Eyewash, quick drench						
Provide:							
Clothing:	Any poss	NIOSH/OSHA 47 ppm: SA/SCBA 50 ppm: SA,CF/SCBAF/SAF § SCBAF,PD,PP/SAF,PD,PP:ASCBA Escape: GMFS/SCBAE	Inh	Asphy and death at high levels, weak, head, conf; nau, vomit, incr rate and depth of respiration or respiration slow and gasping	Eye	Irr immed Water flush immed Resp support Medical attention immed	CNS, CVS, liver, kidneys
Goggles:	Any poss		Abs				
Wash:	Immed contam		Ing				
Change:	N.R.		Con				
Remove:	Immed wet (flamm)						
Provide:	Eyewash, quick drench						
Clothing:	Any poss	NIOSH/OSHA 30 ppm: SA*/SCBA*/PAPRS*/CCRS*/GMFS § SCBAF,PD,PP/SAF,PD,PP:ASCBA Escape: GMFS/SCBAE	Inh	Irrit eyes, nose, throat, pulm edema, skin, eye burns; nasal congestion; bron	Eye	Irr immed Water flush immed Resp support Medical attention immed	Eyes, resp sys, skin
Goggles:	Any poss		Abs				
Wash:	Immed contam		Ing				
Change:	N.R.		Con				
Remove:	Immed non-imperv contam						
Provide:	Eyewash, quick drench						
Clothing:	Any poss	NIOSH/OSHA 10 ppm: SA*/SCBA* 25 ppm: SA:CF* 50 ppm: SCBAF/SAF 75 ppm: SAF,PD,PP § SCBAF,PD,PP/SAF,PD,PP:ASCBA Escape: GMFS/SCBAE	Inh	Irrit eyes, nose, throat, corneal ulcer; arythema, vesicles on skin; bleaching hair	Eye	Irr immed Water flush immed Resp support Medical attention immed	Eyes, skin, resp sys
Goggles:	Any poss		Ing				
Wash:	Prompt contam		Con				
Change:	N.R.						
Remove:	Immed non-imperv contam						
Provide:	Eyewash, quick drench						

Hydrogen peroxide

Chemical name, structure/formula, CAS and RTECS Nos., and DOT ID and guide Nos.	Synonyms, trade names, and conversion factors	Exposure limits (TWA unless noted otherwise)	IDLH	Physical description	Chemical and physical properties		Incompatibilities and reactivities	Measurement method (See Table 1)
					MW, BP, SOL Fl.P, IP, Sp.Gr, flammability	VP, FRZ UEL, LEL		
Hydrogen selenide (as Se) H ₂ Se 7783-07-5 MX1050000	Selenium dihydride, Selenium hydride	NIOSH/OSHA 0.05 ppm (0.2 mg/m ³)	2 ppm	Colorless gas with an odor resembling decayed horse radish	MW 81.0 BP: -42°F Sol(73°F) 0.9% Fl.P. NA (Gas) IP. 9.88 eV	VP: >1 atm FRZ -87°F UEL: ? LEL ?	Strong oxidizers, acids, water, halogenated hydrocarbons	None available
2202 18	1 ppm = 3.37 mg/m ³				Flammable Gas			
Hydrogen sulfide H ₂ S 7783-06-4 MX1225000	Hydrosulfuric acid, Sewer gas, Sulfuretted hydrogen	NIOSH C 10 ppm (15 mg/m ³) [10-min] OSHA 10 ppm (14 mg/m ³) ST 15 ppm (21 mg/m ³)	300 ppm	Colorless gas with a strong odor of rotten eggs. [Note: Sense of smell becomes rapidly fatigued & can NOT be relied upon to warn of the continuous presence of H ₂ S	MW: 34.1 BP -77°F Sol 0.4% Fl.P. NA (Gas) IP. 10.46 eV	VP: >1 atm FRZ -122°F UEL 44.0% LEL 4.0%	Strong oxidizers, strong nitric acid, metals	Dry tube/ Mol-sieve, Thermal desorp; GC/FID; II(6) [P&CAM #296]
1053 13	1 ppm = 1.42 mg/m ³				Flammable Gas			
Hydroquinone C ₆ H ₄ (OH) ₂ 123-31-9 MX3500000	1,4-Benzenediol; Dihydroxybenzene; 1,4-Dihydroxybenzene, Quinol	NIOSH C 2 mg/m ³ [15-min] OSHA 2 mg/m ³	Unknown	Light tan, light gray, or colorless crystals	MW. 110.1 BP 545°F Sol: 7% Fl.P: 329°F (Molten) IP: 7.95 eV	VP: 0.00001 mm MLT: 338°F UEL ? LEL ?	Strong oxidizers, alkalis	Filter; CH ₃ COOH HPLC/UVD, III [#5004]
2662 53					Sp.Gr: 1.33 Combustible Solid, dust cloud may explode if ignited in an enclosed area			
Iodine I ₂ 7553-56-2 NN1575000	Iodine crystals, Molecular iodine	NIOSH/OSHA C 0.1 ppm (1 mg/m ³)	10 ppm	Violet solid with a sharp, characteristic odor	MW 253.8 BP 365°F Sol: 0.01% Fl.P: NA IP 9.31 eV	VP(77°F) 0.3 mm MLT 236°F UEL: NA LEL: NA	Ammonia, acetylene, acetaldehyde, powdered aluminum, active metals, liquid chlorine	Char*, Na ₂ CO ₃ , IC, III [#6005]
					Sp.Gr 4.93 Noncombustible	Solid		