

IV. CHEMICAL LISTING

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		
Acetaldehyde <chem>CH3CHO</chem> 75-07-0 AB1925000	Acetic aldehyde, Ethanal, Ethyl aldehyde	NIOSH Ca See Appendix A OSHA 100 ppm (180 mg/m ³) ST 150 ppm (270 mg/m ³)	Ca [10,000 ppm]	Colorless liquid or gas (above 69°F) with a pungent, fruity odor.	MW: 44.1 BP: 69°F Sol: Miscible Fl.P: -36°F IP: 10.22 eV Sp.Gr: 0.79 Class 1A Flammable Liquid	VP: 740 mm FRZ: -190°F UEL: 60% LEL: 4.0%	Strong oxidizers, acids, bases, alcohols, ammonia & amines, phenols, ketones, HCN, H ₂ S [Note: Prolonged contact with air may cause formation of peroxides that may explode and burst con- tainers; easily undergoes polymerization.]	XAD-2*; Toluene; GC/FID; III [#2538]
1089 26	1 ppm = 1.83 mg/m ³							
Acetic acid <chem>CH3COOH</chem> 64-19-7 AF1225000	Acetic acid (aqueous), Ethanoic acid, Glacial acetic acid (pure compound), Methanecarboxylic acid [Note: Can be found in concentrations of 5-8% in vinegar.]	NIOSH 10 ppm (25 mg/m ³) ST 15 ppm (37 mg/m ³) OSHA 10 ppm (25 mg/m ³)	1000 ppm	Colorless liquid or crystals with a sour, vinegar- like odor. [Note: Pure com- pound is a solid below 62°F. Often used in an aqueous solution.]	MW: 60.1 BP: 244°F Sol: Miscible Fl.P: 102°F IP: 10.66 eV Sp.Gr: 1.05 Class II Combustible Liquid	VP: 11 mm FRZ: 62°F UEL(200°F): 19.9% LEL: 4.0%	Strong oxidizers (especially chromic acid, sodium peroxide & nitric acid), strong caustics [Note: Corrosive to metals.]	Char; HCOOH; GC/FID; III [#1603]
1842 29 (soln) 2790 60 (10-80% acid) 2789 29 (80% acid)								
Acetic anhydride <chem>(CH3CO)2O</chem> 108-24-7 AK1925000	Acetic acid anhydride, Acetic oxide, Acetyl oxide, Ethanoic anhydride	NIOSH/OSHA C 5 ppm (20 mg/m ³)	1000 ppm	Colorless liquid with a strong, pungent, vinegar- like odor.	MW: 102.1 BP: 282°F Sol: 12% Fl.P: 120°F IP: 10.00 eV Sp.Gr: 1.08 Class II Combustible Liquid	VP: 4 mm FRZ: -99°F UEL: 10.3% LEL: 2.7%	Water, alcohols, strong oxidizers (especially chromic acid), amines, strong caustics [Note: Corrosive to iron, steel & other metals. Reacts with water to form acetic acid.]	Bub; Reagent; Vis; III [#3506]
1715 39	1 ppm = 4.24 mg/m ³							
Acetone <chem>CH3COCH3</chem> 67-64-1 AL3150000	Dimethyl ketone, Ketone propane, 2-Propanone	NIOSH 250 ppm (590 mg/m ³) OSHA 750 ppm (1800 mg/m ³) ST 1000 ppm (2400 mg/m ³)	20,000 ppm	Colorless liquid with a fragrant, mint-like odor. [Note: Enforcement of the OSHA TWA for "doffers" in the cellulose acetate fiber industry was stayed on 9/5/89 until 9/1/90; further, the OSHA STEL does NOT apply to that industry.]	MW: 58.1 BP: 133°F Sol: Miscible Fl.P: 0°F IP: 9.69 eV Sp.Gr: 0.79 Class 1B Flammable Liquid	VP: 180 mm FRZ: -140°F UEL: 13% LEL: 2.5%	Oxidizers, acids	Char; CS ₂ ; GC/FID; III [#1300, Ketones I]
1090 26	1 ppm = 2.42 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	NIOSH	Inh	Eye, nose, throat irrit,	Eye:	Irr immed	Resp sys, skin,
Goggles:	Any poss	Y: SCBAF:PD,PP/SAF:PD,PP-ASCBA	Ing	conj; cough; CNS depres;	Skin:	Water flush prompt	kidneys
Wash:	Prompt wet	Escape: GMFOV/SCBAE		eye, skin burns; derm;	Breath.	Resp support	
Change:	N.R.			delayed pulm edema; [carc]	Swallow	Medical attention immed	
Remove:	Immed wet (flamm)						
Provide:	Eyewash						
Clothing:	Any poss >50%/Repeat 10-49%	NIOSH/OSHA	Inh	Conj, lac; irrit nose, throat; phar edema, chronic bron; burns eyes, skin; skin sens; dental erosion; black skin, hyperkeratosis	Eye:	Irr immed	Resp sys, skin, eyes, teeth
Goggles:	Any poss	250 ppm: SA:CF ^E /PAPROV ^E			Skin:	Water flush immed	
Wash:	Immed contam >50%/Prompt 10-49%	500 ppm: CCRFOV/SCBAF/SAF/GMFOV/PAPRTOV ^E			Breath.	Resp support	
Change:	N.R.	1000 ppm: SAF:PD,PP			Swallow:	Medical attention immed	
Remove:	Immed non-imperv contam >50%/Prompt non-imperv contam 10-49%	§: SCBAF:PD,PP/SAF:PD,PP-ASCBA					
Provide:	Eyewash (>5%)/Quick drench (>50%)	Escape: GMFOV/SCBAE					
Clothing:	Reason prob	NIOSH/OSHA	Inh	Conj, lac, corneal edema, opac, photo; nasal, phar irrit, cough, dysp, bron, skin burns, vesic, sens derm	Eye:	Irr immed	Resp sys, eyes, skin
Goggles:	Any poss	125 ppm: SA:CF ^E /PAPROV ^E	Ing		Skin:	Water flush immed	
Wash:	Immed contam	250 ppm: CCRFOV/SCBAF/SAF/GMFOV/PAPRTOV ^E	Con		Breath	Resp support	
Change:	N.R.	1000 ppm: SAF:PD,PP			Swallow.	Medical attention immed	
Remove:	Immed non-imperv contam	§: SCBAF:PD,PP/SAF:PD,PP-ASCBA					
Provide:	Eyewash, quick drench	Escape: GMFOV/SCBAE					
Clothing:	Repeat	NIOSH	Inh	Irrit eyes, nose, throat, head, dizz, derm	Eye:	Irr immed	Resp sys, skin
Goggles:	Reason prob	1000 ppm: CCROV*/PAPROV*/SA*/SCBA*	Ing		Skin	Soap wash immed	
Wash:	Prompt wet		Con		Breath.	Resp support	
Change:	N.R.	6250 ppm: SA:CF*			Swallow	Medical attention immed	
Remove:	Immed wet (flamm)	12,500 ppm: GMFOV/SCBAF/SAF					
		20,000 ppm: SAF:PD,PP					
		§: SCBAF:PD,PP/SAF:PD,PP-ASCBA					
		Escape: GMFOV/SCBAE					

Acetone

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		
Acetonitrile <chem>CH3CN</chem> 75-05-8 AL7700000	Cyanomethane, Ethyl nitrile, Methyl cyanide	NIOSH 20 ppm (34 mg/m ³) OSHA 40 ppm (70 mg/m ³) ST 60 ppm (105 mg/m ³)	4000 ppm ACGIH [skin]	Colorless liquid with an aromatic odor.	MW: 41.1 BP: 179°F Sol: Miscible Fl.P(oc): 42°F IP: 12.20 eV	VP: 73 mm FRZ: -49°F UEL: 16.0% LEL: 3.0%	Strong oxidizers	Char; Benzene; GC/FID; III [#1606]
1648 28	1 ppm = 1.71 mg/m ³				Sp Gr: 0.78 Class IB Flammable Liquid			
2-Acetylaminofluorene <chem>C15H13NO</chem> 53-96-3 AB9450000	AAF, 2-AAF, 2-Acetylaminofluorene, N-Acetyl-2-aminofluorene, FAA, 2-FAA, 2-Fluorenylacetamide	NIOSH Ca See Appendix A OSHA [1910.1014] See Appendix B	Ca	Tan, crystalline powder.	MW: 223.3 BP: ? Sol: Insoluble Fl.P: ? IP: ?	VP: ? MLT: 381°F UEL: ? LEL: ?	None reported	None available
					Combustible Solid			
Acetylene tetrabromide <chem>CHBr2CHBr2</chem> 79-27-6 K18225000	Symmetrical tetrabromo- ethane, TBE, Tetrabromoacetylene, Tetrabromoethane; 1,1,2,2-Tetrabromoethane	NIOSH See Appendix D OSHA 1 ppm (14 mg/m ³)	10 ppm	Pale-yellow liquid with a pungent odor. [Note: A solid below 32°F.]	MW: 345.7 BP: 474°F (Decomposes) Sol: 0.07% Fl.P: NA IP: ?	VP: 0.02 mm FRZ: 32°F UEL: NA LEL: NA	Strong caustics; hot iron, reducing metals such as aluminum, magnesium & zinc	Si gel, THF, GC/FID; III [#2003]
2504 58	1 ppm = 14.37 mg/m ³				Sp Gr: 2.97 Noncombustible Liquid			
Acrolein <chem>CH2=CHCHO</chem> 107-02-8 AS1050000	Acraldehyde, Acrylaldehyde, Acrylic aldehyde, Allyl aldehyde, Propenal, 2-Propenal	NIOSH/OSHA 0.1 ppm (0.25 mg/m ³) ST 0.3 ppm (0.8 mg/m ³)	5 ppm	Colorless or yellow liquid with a piercing, disagreeable odor.	MW: 56.1 BP: 127°F Sol: 40% Fl.P: -15°F IP: 10.13 eV	VP: 210 mm FRZ: -126°F UEL: 31% LEL: 2.8%	Oxidizers, acids, alkalis, ammonia, amines [Note: Polymerizes readily unless inhibited—usually with hydroquinone.]	XAD-2*; Toluene; GC/NPD; III [#2501]
1092 30 (inhibited)	1 ppm = 2.33 mg/m ³				Sp.Gr: 0.84 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 Reason prob Immed contam N.R. Immed wet (flamm) Quick drench	NIOSH 200 ppm: CCROV/SA/SCBA 500 ppm: SA/CF/PAPROV 1000 ppm: GMFOV/SCBAF/SAF/ CCRFOV 4000 ppm: SAF/PD,PP §. SCBAF/PD,PP/SAF/PD,PP.ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Asphy; nau, vomit; chest pain; weak; stupor, convuls; eye irrit	Eye: Skin: Breath: Swallow:	Irr immed Water flush immed Resp support Medical attention immed	Kidneys, liver, CVS, CNS, lungs, skin, eyes
Clothing: Goggles: Wash: Change: Remove: Provide:	Any poss Any poss Immed contam/daily After work if any poss contam Immed contam Eyewash, quick drench	NIOSH ¥ SCBAF/PD,PP/SAF/PD,PP.ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Reduced function of liver, kidneys, bladder, pancreas, [carc]	Eye: Skin: Breath: Swallow.	Irr immed Soap wash immed Resp support Medical attention immed	Liver, bladder, kidneys, pancreas, skin, lungs
Clothing: Goggles: Wash: Change: Remove: Provide:	Repeat Reason prob Prompt contam N.R. Prompt non-imperv contam	OSHA 10 ppm: SA/SCBA §: SCBAF/PD,PP/SAF/PD,PP.ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, nose, anor, nau; severe head, abdom pain, jaun, monocy	Eye: Skin: Breath: Swallow.	Irr immed Water flush prompt Resp support Medical attention immed	Eyes, upper resp sys, liver
Clothing: Goggles: Wash: Change: Remove: Provide:	Any poss Any poss Immed contam N.R. Immed wet (flamm) Eyewash, quick drench	NIOSH/OSHA 2.5 ppm: SA/CF*/PAPROV* 5 ppm: CCRFOV/GMFOV/SCBAF/SAF §. SCBAF/PD,PP/SAF/PD,PP.ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, skin, muc memb; abnormal pulm func; delayed pulm edema; chronic resp disease	Eye: Skin: Breath: Swallow.	Irr immed Water flush immed Resp support Medical attention immed	Heart, eyes, skin, resp sys

Acrolein

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		
Acrylamide $\text{CH}_2=\text{CHCONH}_2$ 79-06-1 AS3325000	Acrylamide monomer, Acrylic amide, Propenamide, 2-Propenamide	NIOSH Ca See Appendix A 0.03 mg/m ³ [skin] OSHA 0.03 mg/m ³ [skin]	Ca [Unknown] ACGIH A2	White crystalline, odorless solid	MW: 71.1 BP: 347-572°F (Decomposes) Sol(86°F): 216% Fl.P: 280°F IP: ? Sp.Gr(86°F): 1.12 Combustible Solid (may also be dissolved in flammable liquids)	VP: 0.007 mm MLT: 184°F UEL: ? LEL: ?	Strong oxidizers [Note: May polymerize violently upon melting.]	Filter/ Si gel, Methanol, GC/NPD, OSHA [#21]
2074 55								
Acrylonitrile $\text{CH}_2=\text{CHCN}$ 107-13-1 AT5250000	Acrylonitrile monomer, AN, Cyanoethylene, Propenenitrile, 2-Propenenitrile, VCN, Vinyl cyanide	NIOSH Ca See Appendix A 1 ppm C 10 ppm [15-min] [skin] OSHA [1910 1045] 2 ppm C 10 ppm [15-min] [skin]	Ca [500 ppm] ACGIH A2	Colorless to pale- yellow liquid with an unpleasant odor. [Note: Odor can only be detected above the PEL.]	MW: 53.1 BP: 171°F Sol: 7% Fl.P 30°F IP: 10.91 eV Sp.Gr: 0.81 Class IB Flammable Liquid	VP: 83 mm FRZ: -116°F UEL 17% LEL: 3.0%	Strong oxidizers, acids & alkalis, bromine, amines [Note: Unless inhib- ited (usually with methylhydroquinone) may polymerize spontaneously or when heated or in presence of strong alkali. Attacks copper.]	Char; Acetone/ CS ₂ ; GC/FID; III [#1604]
1093 30 (inhibited)	1 ppm = 2.21 mg/m ³							
Aldrin $\text{C}_{12}\text{H}_8\text{Cl}_6$ 309-00-2 IO2100000	1,2,3,4,10,10-Hexachloro- 1,4,4a,5,8,8a-hexahydro- endo,exo-1,4:5,8- dimethanonaphthalene; HHDN; Octalene	NIOSH Ca See Appendix A 0.25 mg/m ³ [skin] OSHA 0.25 mg/m ³ [skin]	Ca [100 mg/m ³]	Colorless to dark brown crystalline solid with a mild chemical odor. [Note: Formerly used as an insecticide.]	MW: 364.9 BP: Decomposes Sol: 0.003% Fl.P: NA IP: ? Sp.Gr: 1.60 Noncombustible Solid, but may be dissolved in flammable liquids.	VP: 0.00008 mm MLT: 219°F UEL: NA LEL: NA	Concentrated mineral acids, active metals, acid catalysts, acid oxidizing agents, phenol	Filter/Bub; Isooctane; GC/EConD, III [#5502]
2761 55								
Allyl alcohol $\text{CH}_2=\text{CHCH}_2\text{OH}$ 107-18-6 BA5075000	AA, Allylic alcohol, 1-Propene-3-ol, Propenol, 2-Propenol, Vinyl carbinol	NIOSH/OSHA 2 ppm (5 mg/m ³) ST 4 ppm (10 mg/m ³) [skin]	150 ppm	Colorless liquid with a pungent, mustard-like odor.	MW: 58.1 BP: 205°F Sol: Miscible Fl.P: 70°F IP: 9.63 eV Sp.Gr: 0.85 Class IB Flammable Liquid	VP: 17 mm FRZ: -200°F UEL: 18.0% LEL: 2.5%	Strong oxidizers, acids, carbon tetrachloride	Char; 2-Propanol/ CS ₂ ; GC/FID; III [#1402, Alcohols III]
1098 28	1 ppm = 2.42 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	NIOSH	Inh	Ataxia, numb limbs, pares;	Eye:	Irr immed	CNS, PNS, skin,
Goggles:	Reason prob	¥: SCBAF:PD,PP/SAF:PD,PP:ASCBA	Abs	muscle weak; absent deep	Skin:	Water flush immed	eyes
Wash:	Immed contam	Escape: GMFOV/SCBAE	Ing	tendon reflex; hand	Breath:	Resp support	
Change:	After work if reason prob contam		Con	sweat; itg, lethargy; irrit eyes, skin; [carc]	Swallow:	Medical attention immed	
Remove:	Immed non-imperv contam						
Provide:	Quick drench						
Clothing:	Repeat	NIOSH	Inh	Asphy; irrit eyes, head;	Eye:	Irr immed	CVS, liver,
Goggles:	Reason prob	¥: SCBAF:PD,PP/SAF:PD,PP:ASCBA	Abs	sneezing; nau, vomit;	Skin:	Water wash immed	kidneys, CNS,
Wash:	Immed wet	Escape: GMFOV/SCBAE	Ing	weak, li-head; skin vesic;	Breath:	Resp support	skin, brain
Change:	N.R.		Con	scaling derm, [carc]	Swallow:	Medical attention immed	tumor, lung and bowel cancer
Remove:	Immed wet (flamm)						
Provide:	Quick drench						
Clothing:	Any poss	NIOSH	Inh	Head, dizz; nau, vomit,	Eye:	Irr immed	Cancer, CNS,
Goggles:	Reason prob	¥: SCBAF:PD,PP/SAF:PD,PP:ASCBA	Abs	mal; myoclonic jerks of	Skin:	Soap wash immed	liver, kidneys,
Wash:	Immed contam	Escape: GMFOV/SCBAE	Ing	limbs, clonic, tonic	Breath:	Resp support	skin
Change:	After work if any poss contam		Con	convuls; coma; hema, azotemia; [carc]	Swallow:	Medical attention immed	
Remove:	Immed non-imperv contam						
Provide:	Quick drench						
Clothing:	Any poss liq/Repeat vap >25 ppm	NIOSH/OSHA	Inh	Eye irrit, tissue damage;	Eye:	Irr immed	Eyes, skin, resp
Goggles:	Reason prob	50 ppm: SA,CF*/PAPROV*	Abs	irrit upper resp sys,	Skin:	Water flush immed	sys
Wash:	Immed contam	100 ppm: CCRFOV/GMFOV/SCBAF/SAF/PAPRTOV*	Ing	skin; pulm edema	Breath:	Resp support	
Change:	N.R.	150 ppm: SAF:PD,PP			Swallow:	Medical attention immed	
Remove:	Immed wet (flamm)	§: SCBAF:PD,PP/SAF:PD,PP:ASCBA					
Provide:	Quick drench	Escape: GMFOV/SCBAE					

Allyl alcohol

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		
Allyl chloride <chem>CH2=CHCH2Cl</chem> 107-05-1 UC7350000	3-Chloropropene, 1-Chloro-2-propene, 3-Chloropropylene	NIOSH/OSHA 1 ppm (3 mg/m ³) ST 2 ppm (6 mg/m ³)	300 ppm	Colorless, brown, yellow, or purple liquid with a pungent, unpleasant odor	MW: 76.5 BP: 113°F Sol. 0.4% Fl.P. -25°F IP 10.05 eV	VP: 295 mm MLT: -210°F UEL: 11.1% LEL: 2.9%	Strong oxidizers, acids, amines, iron & aluminum chlorides, magnesium, zinc	Char; Benzene, GC/FID; II(4) [#1000]
1100 28	1 ppm = 3.18 mg/m ³				Sp Gr: 0.94 Class IB Flammable Liquid			
Allyl glycidyl ether <chem>C6H10O2</chem> 106-92-3 RR0875000	AGE; 1-Allyloxy-2,3-epoxypropane; Glycidyl allyl ether; [(2-Propenyloxy)methyl] oxirane	NIOSH 5 ppm (22 mg/m ³) ST 10 ppm (44 mg/m ³) [skin]	270 ppm	Colorless liquid with a pleasant odor.	MW 114.2 BP: 309°F Sol. 14% Fl.P. 135°F IP. ?	VP: 2 mm FRZ: -148°F [forms glass] UEL: ? LEL: ?	Strong oxidizers	Tenax GC, Diethyl ether, GC/FID, II(4) [#S346]
2219 29	1 ppm = 4.75 mg/m ³	OSHA 5 ppm (22 mg/m ³) ST 10 ppm (44 mg/m ³)			Sp Gr: 0.97 Class II Combustible Liquid			
4-Aminodiphenyl <chem>C6H5C6H4NH2</chem> 92-67-1 DU8925000	4-Aminobiphenyl, p-Aminobiphenyl, p-Aminodiphenyl, Biphenylamine, 4-Phenylaniline	NIOSH Ca See Appendix A OSHA [1910.1011] See Appendix B ACGIH A1 [skin]	Ca	Colorless crystals with a floral odor. [Note. Turns purple on contact with air.]	MW: 169.2 BP: 576°F Sol. Slight Fl.P. ? IP. ?	VP(227°F): 1 mm MLT: 127°F UEL: ? LEL: ?	None reported	Filter/ Si gel; 2-Propanol; GC/FID, II(4) [P&CAM #269]
2-Aminopyridine <chem>NH2C5H4N</chem> 504 29-0 US1575000	alpha-Aminopyridine, alpha-Pyridylamine	NIOSH/OSHA 0.5 ppm (2 mg/m ³)	5 ppm	White powder, leaflets, or crystals with a characteristic odor	MW: 94.1 BP: 411°F Sol. >100% Fl.P. 154°F IP 8.00 eV	VP: Low MLT: 137°F UEL: ? LEL: ?	Strong oxidizers	Tenax GC(2); Thermal desorp, GC/FID; II(4) [#S158]
2671 55	1 ppm = 3.91 mg/m ³				Combustible Solid			

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	NIOSH/OSHA	Inh	Irrit eyes, nose, skin,	Eye:	Irr immed	Resp sys, skin, eyes, liver, kidneys
Goggles:	Reason prob	25 ppm: SA/CF*	Abs	pulm edema;	Skin:	Soap wash immed	
Wash:	Immed contam	50 ppm: SCBAF/SAF	Ing	in animals: liver, kidney	Breath:	Resp support	
Change:	N.R.	300 ppm: SAF/PD,PP	Con	damage	Swallow:	Medical attention immed	
Remove:	Immed wet (flamm)	§ SCBAF/PD,PP/SAF/PD,PP:ASCBA					
Provide:	Quick drench	Escape: GMFOV/SCBAE					
Clothing:	Reason prob	NIOSH/OSHA	Inh	Derm; eye, nose irrit;	Eye:	Irr immed	Resp sys, skin
Goggles:	Any poss	50 ppm: SA/SCBA/CCRVOV	Abs	pulm irrit, edema; narco	Skin:	Water flush prompt	
Wash:	Prompt contam	125 ppm: SA/CF*/PAPROV*	Ing		Breath:	Resp support	
Change:	N.R.	250 ppm: GMFOV/SCBAF/SAF/CCRFOV/SAT:CF	Con		Swallow:	Medical attention immed	
Remove:	Prompt non-imperv contam	270 ppm: SAF/PD,PP					
Provide:	Eyewash	§ SCBAF/PD,PP/SAF/PD,PP:ASCBA Escape: GMFOV/SCBAE					
Clothing:	Any poss	NIOSH	Inh	Head, dizz; lethargy,	Eye:	Irr immed	Bladder, skin
Goggles:	Any poss	¥: SCBAF/PD,PP/SAF/PD,PP:ASCBA	Abs	dysp; ataxia, weak,	Skin:	Soap wash immed	
Wash:	Immed contam/daily	Escape: HiEF/SCBAE	Ing	methemoglobinemia,	Breath:	Resp support	
Change:	After work if any poss contam		Con	urinary burning, acute hemorrhagic cystitis, [carc]	Swallow:	Medical attention immed	
Remove:	Immed contam						
Provide:	Eyewash, quick drench						
Clothing:	Reason prob	NIOSH/OSHA	Inh	Head, dizz; excitement;	Eye:	Irr immed	CNS, resp sys
Goggles:	Reason prob	5 ppm: SA*/SCBA*	Abs	nau; high BP; resp	Skin:	Water flush immed	
Wash:	Immed contam	§ SCBAF/PD,PP/SAF/PD,PP:ASCBA	Ing	distress, weak; convuls;	Breath:	Resp support	
Change:	After work if reason prob contam	Escape: GMFOVHiE/SCBAE	Con	stupor	Swallow:	Medical attention immed	
Remove:	Immed non-imperv contam						
Provide:	Quick drench						

2-Aminopyridine

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		
Ammonia NH_3 7664-41-7 BO0875000 2672 60 (12-44% soln) 2073 15 (44% soln) 1005 15 (anhydrous)	Anhydrous ammonia, Aqua ammonia, Aqueous ammonia 1 ppm = 0.71 mg/m ³	NIOSH 25 ppm (18 mg/m ³) ST 35 ppm (27 mg/m ³) OSHA ST 35 ppm (27 mg/m ³)	500 ppm	Colorless gas with a pungent, suffo- cating odor. [Note: Often used in an aqueous solution. Easily liquefied under pressure.]	MW: 17.0 BP: -28°F Sol: 34% Fl.P: NA (Gas) IP: 10 18 eV	VP: >1 atm FRZ: -108°F UEL: 28% LEL: 15%	Strong oxidizers, acids, halogens, salts of silver & zinc [Note: Corrosive to copper & galvanized surfaces.]	Passive sampler; none; IC, III [#6701]
Ammonium sulfamate $\text{NH}_4\text{SO}_3\text{NH}_2$ 7773-06-0 WO6125000 9089 31	Ammate® herbicide, Ammonium aminosulfonate, Monoammonium salt of sulfamic acid, Sulfamate	NIOSH/OSHA 10 mg/m ³ (total) 5 mg/m ³ (resp)	5000 mg/m ³	Colorless to white crystalline, odorless solid. [herbicide]	MW: 114.1 BP: 320°F (Decomposes) Sol: 200% Fl.P: NA IP: ?	VP: Low MLT: 268°F UEL: NA LEL: NA	Acids, hot water [Note: Elevated temperatures cause a highly exothermic reaction with water.]	Filter, Water; IC, II(5) [#S348]
n-Amyl acetate $\text{CH}_3\text{COO}[(\text{CH}_2)_4\text{CH}_3]$ 628-63-7 AJ1925000	Amyl acetic ester, Amyl acetic ether, 1-Pentanol acetate, Pentyl ester of acetic acid, Primary amyl acetate	NIOSH/OSHA 100 ppm (525 mg/m ³)	4000 ppm	Colorless liquid with a persistent banana-like odor.	MW: 130.2 BP: 301°F Sol: 0.2% Fl.P: 77°F IP: ?	VP(77°F): 5 mm FRZ: -95°F UEL: 7.5% LEL: 1.1%	Nitrates; strong oxidizers, alkalis & acids	Char, CS ₂ , GC/FID, III [#1450, Esters I]
1104 26	1 ppm = 5.41 mg/m ³				Sp.Gr: 0.88 Class IC Flammable Liquid			
sec-Amyl acetate $\text{CH}_3\text{COOCH}(\text{CH}_3)\text{C}_4\text{H}_9$ 626-38-0 AJ2100000	1-Methylbutyl acetate, 2-Pentanol acetate, 2-Pentyl ester of acetic acid	NIOSH/OSHA 125 ppm (650 mg/m ³)	9000 ppm	Colorless liquid with a mild odor.	MW: 130.2 BP: 249°F Sol: Slight Fl.P: 89°F IP: ?	VP: 7 mm FRZ: -148°F UEL: ? LEL: ?	Nitrates, strong oxidizers, alkalis & acids	Char, CS ₂ , GC/FID, III [#1450, Esters I]
1104 26	1 ppm = 5.41 mg/m ³				Sp.Gr: 0.87 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:	Any poss >10%/Repeat <10%	NIOSH	Inh	Eye, nose, throat irrit;	Eye	Irr immed	Resp sys, eyes
Goggles:	Any poss	250 ppm: CCRS*/SA*/SCBA*	Ing	dysp, bronspas, chest	Skin:	Water flush immed	
Wash:	Immed contam >10%/ Prompt wet <10%	500 ppm: PAPRS*/SCBAF/SAF/ GMFS/CCRFS/SA,CF*	Con	pain; pulm edema, pink frothy sputum, skin burns, vesic	Breath:	Resp support	
Change:	N R	§: SCBAF:PD,PP/SAF:PD,PP,ASCBA			Swallow:	Medical attention immed	
Remove:	Immed non-imperv >10%/ Prompt non-imperv contam <10%	Escape: GMFS/SCBAE					
Provide:	Eyewash 10%, quick drench >10%						
Clothing:	N R	NIOSH/OSHA	Inh	Irrit eyes, nose, throat;	Eye:	Irr immed	Upper resp sys, eyes
Goggles:	N.R.	50 mg/m ³ : DM	Ing	cough, difficult breath	Skin:	Soap wash prompt	
Wash:	N.R.	100 mg/m ³ : DMXSQ/SA	Con		Breath:	Resp support	
Change:	N.R.	250 mg/m ³ : PAPRDM/SA:CF			Swallow:	Medical attention immed	
Remove:	N R	500 mg/m ³ : HiEF/PAPRTHiE/ SAT:CF/SCBAF/SAF					
		5000 mg/m ³ : SA,PD,PP					
		§: SCBAF:PD,PP/SAF:PD,PP,ASCBA					
		Escape: HiEF/SCBAE					
Clothing:	Repeat	NIOSH/OSHA	Inh	Irrit eyes, nose, narco;	Eye:	Irr immed	Eyes, skin, resp sys
Goggles:	Reason prob	1000 ppm: PAPROV*/CCROV*/SA*/ SCBA*	Ing	derm	Skin:	Water flush prompt	
Wash:	Prompt wet		Con		Breath:	Resp support	
Change:	N R	2500 ppm: SA:CF*			Swallow:	Medical attention immed	
Remove:	Immed wet (flamm)	4000 ppm: GMFOV/SCBAF/SAF					
		§: SCBAF:PD,PP/SAF:PD,PP,ASCBA					
		Escape: GMFOV/SCBAE					
Clothing:	Repeat	NIOSH/OSHA	Inh	Irrit eyes, nose; narco;	Eye:	Irr immed	Resp sys, eyes, skin
Goggles:	Reason prob	1000 ppm: PAPROV*/CCROV*	Ing	derm	Skin:	Water flush prompt	
Wash:	Prompt wet	1250 ppm: SA*/SCBA*	Con		Breath:	Resp support	
Change:	N.R.	3125 ppm: SA,CF*			Swallow:	Medical attention immed	
Remove:	Immed wet (flamm)	6250 ppm: GMFOV/SCBAF/SAF					
		9000 ppm: SAF:PD,PP					
		§: SCBAF:PD,PP/SAF:PD,PP,ASCBA					
		Escape: GMFOV/SCBAE					

sec-Amyl 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		
Aniline and homologs <chem>C6H5NH2</chem> 62-53-3 BW6650000	Aminobenzene, Aniline oil, Benzenamine, Phenylamine	NIOSH Ca See Appendix A 2 ppm (8 mg/m ³) [skin] OSHA 2 ppm (8 mg/m ³) [skin]	Ca [100 ppm]	Colorless to brown oily liquid with an aromatic amine- like odor. [Note: A solid below 21°F]	MW: 93.1 BP: 363°F Sol: 4% Fl.P: 158°F IP: 7.70 eV	VP: 0.6 mm FRZ: 21°F UEL: 11% LEL: 1.3%	Strong oxidizers, strong acids, toluene diisocyanate	Si gel; Ethanol; GC/FID, III [#2002, Aromatic Amines]
1547 57	1 ppm = 3.87 mg/m ³				Sp Gr: 1.02 Class IIIA Combustible Liquid			
Anisidine (o-, p- isomers) <chem>NH2C6H4OCH3</chem> o: 90-04-0 BZ5410000 p: 104-94-9 BZ5450000	o: ortho-Aminoanisole, 2-Anisidine, o-Methoxyaniline p: para-Aminoanisole, 4-Anisidine, p-Methoxyaniline	NIOSH Ca See Appendix A 0.5 mg/m ³ [skin] OSHA 0.5 mg/m ³ [skin]	Ca [50 mg/m ³]	o: Red or yellow oily liquid with an amine-like odor. [Note: A solid below 41°F.] p: Yellow to brown crystalline solid with an amine- like odor.	MW: 123.2 BP: 437/475°F Sol: Insoluble/ Moderate Fl.P: 244(oc)/ 86°F IP: 7.44 eV Sp Gr: 1.10/1.07 o: Class IIIB Combustible Liquid p: Combustible Solid	VP: <0.1/ <0.1 mm FRZ/MLT 41/135°F UEL: ?/? LEL: ?/?	Strong oxidizers	XAD-2, Methanol; HPLC/UVD, III [#2514]
2431 55	1 ppm = 5.12 mg/m ³							
Antimony and compounds (as Sb) Sb 7440-36-0 (Metal) CC4025000 (Metal) 2871 53 (Sb powder)	Metal: Antimony powder, Stibium Synonyms of other com- pounds vary depending upon the specific compound.	NIOSH/OSHA 0.5 mg/m ³	80 mg/m ³	Metal. Silver- white, lustrous, hard, brittle solid; scale-like crystals; or a dark gray, lustrous powder.	MW: 121.8 BP: 2975°F Sol: Insoluble Fl.P: NA IP: NA Sp Gr: 6.69 Metal: Noncombustible Solid in bulk form, but a moderate explosion hazard in the form of dust when exposed to flame	VP: 0 mm (approx) MLT: 1166°F UEL: NA LEL: NA	Strong oxidizers, acids, halogenated acids [Note: Stibine is formed when antimony is exposed to nascent (freshly formed) hydrogen.]	Filter, Acid, AA, II(4) [P&CAM #261]
ANTU <chem>C10H7NHC(NH2)S</chem> 86-88 4 YT9275000	alpha-Naphthyl thio- carbamide, 1-Naphthyl thiourea, alpha-Naphthyl thiourea	NIOSH/OSHA 0.3 mg/m ³	100 mg/m ³	White crystalline or gray odorless powder. [rodenticide]	MW: 202.3 BP: Decomposes Sol: 0.06% Fl.P: NA IP: ?	VP: Low MLT: 388°F UEL: NA LEL: NA	Strong oxidizers, silver nitrate	Filter, Methanol, HPLC/UVD; II(5) [#S276]
1651 53					Noncombustible Solid			

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:	Reason prob	NIOSH	Inh	Head; weak, dizzy; cyan;	Eye:	Irr immed	Blood, CVS,
Goggles:	Reason prob	¥: SCBAF·PD,PP/SAF·PD,PP·ASCBA	Abs	ataxia; dysp on effort;	Skin:	Soap wash prompt	liver, kidneys
Wash:	Immed contam	Escape: GMFOV/SCBAE	Ing	tacar; eye irrit; [carc]	Breath:	Resp support	
Change:	N.R.		Con		Swallow:	Medical attention immed	
Remove:	Immed non-imperv contam						
Provide:	Quick drench						
Clothing:	Reason prob	NIOSH	Inh	Head, dizzy; cyan, RBC	Eye:	Irr immed	Blood, kidneys,
Goggles:	Reason prob	¥: SCBAF·PD,PP/SAF·PD,PP·ASCBA	Abs	Heinz bodies; [carc]	Skin:	Soap wash immed	liver, CVS
Wash:	Immed contam	Escape: HiEF/SCBAE	Ing		Breath:	Resp support	
Change:	After work if reason prob contam		Con		Swallow:	Medical attention immed	
Remove:	Immed non-imperv contam						
Provide:	Quick drench						
Clothing:	Reason prob	NIOSH/OSHA	Inh	Irrit nose, throat, mouth;	Skin:	Soap wash immed	Resp sys, CVS,
Goggles:	Reason prob	5 mg/m ³ : DMXSQ ⁴ /SA/SCBA	Con	cough; dizzy; head; nau,	Breath:	Resp support	skin, eyes
Wash:	Prompt contam	12.5 mg/m ³ : PAPRDM ⁴ /SA:CF		vomit, diarr; stomach	Swallow:	Medical attention immed	
Change:	After work if reason prob contam	25 mg/m ³ : HiEF/PAPRTHiE/ SAT:CF/SCBAF/SAF		cramps; insom; anor, irrit			
Remove:	Prompt non-imperv contam	80 mg/m ³ : SA·PD,PP		skin; unable to smell properly; cardiac abnormalities in antimony trichloride exposures			
		§: SCBAF·PD,PP/SAF·PD,PP·ASCBA					
		Escape: HiEF/SCBAE					
Clothing:	N.R.	NIOSH/OSHA	Inh	After ingestion of large	Eye:	Irr immed	Resp sys
Goggles:	N.R.	3 mg/m ³ : CCROVDMFu/SA/SCBA	Ing	doses. vomit, dysp, cyan,	Skin:	Soap wash prompt	
Wash:	N.R.	7.5 mg/m ³ : PAPROVDMFu/SA:CF		coarse pulm rales; mild	Breath:	Resp support	
Change:	After work if reason prob contam	15 mg/m ³ : CCRFOVHiE/PAPRTOVHiE/ SAT:CF/SCBAF/SAF/ GMFOVHiE		liver damage	Swallow:	Medical attention immed	
Remove:	N.R.	100 mg/m ³ : SA·PD,PP					
		§: SCBAF·PD,PP/SAF·PD,PP·ASCBA					
		Escape: GMFOVHiE/SCBAE					

ANTU

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		
Arsenic (inorganic compounds as As) As 7740-38-2 (Metal) CG0525000 (Metal) 1558 53 (Metal)	Metal Arsenia Synonyms of other compounds vary depending upon the specific compound. [Note. OSHA considers "Inorganic Arsenic" to mean copper acetoarsenite & all inorganic compounds containing arsenic except ARSINE.]	NIOSH Ca See Appendix A C 0 002 mg/m ³ [15-min] OSHA [1910.1018] 0.010 mg/m ³	Ca [100 mg/m ³]	Metal: Silver-gray or tin-white, brittle, odorless solid	MW: 74.9 BP: Sublimes Sol: Insoluble Fl.P: NA IP: NA Sp Gr 5.73 Metal Noncombustible Solid in bulk form, but a slight explosion hazard in the form of dust when exposed to flame.	VP: 0 mm (approx) MLT: 1135°F (Sublimes) UEL: NA LEL: NA	Strong oxidizers, bromine azide, [Note. Hydrogen gas can react with inorganic arsenic to form the highly toxic gas arsine.]	Filter, Acid; AA, III [#7900]
Arsine AsH ₃ 7784-42-1 CG6475000	Arsenic hydride, Arsenic trihydride, Arseniureted hydrogen, Arsenious hydride, Hydrogen arsenide	NIOSH Ca See Appendix A C 0 002 mg/m ³ [15-min] OSHA 0.05 ppm (0.2 mg/m ³)	Ca [6 ppm]	Colorless gas with a mild garlic-like odor.	MW: 78.0 BP: -81°F Sol: 20% Fl.P: NA (Gas) IP: 9.89 eV	VP: >1 atm FRZ: -179°F UEL: ? LEL: ?	Strong oxidizers, chlorine, nitric acid [Note. Decomposes above 446°F. There is a high potential for the generation of arsine gas when inorganic arsenic is exposed to nascent (freshly formed) hydrogen]	Char, HNO ₃ ; HGA, III [#6001]
2188 18	1 ppm = 3.24 mg/m ³				Flammable Gas			
Asbestos Hydrated mineral silicates 1332-21-4 Cl6475000 2212 31 (blue) 2590 31 (white)	Actinolite, Amosite (cummingtonite- grunerite), Anthophyllite, Chrysotile, Crocidolite, Tremolite	NIOSH Ca See Appendix A See Appendix C OSHA [1910.1001] OSHA [1910.1101] See Appendix C ACGIH See Appendix C	Ca	White or greenish (chrysotile), blue (crocidolite), or gray-green (amosite) fibrous, odorless solids.	MW: Varies BP: Decomposes Sol: Insoluble Fl.P: NA IP: NA	VP: 0 mm (approx) MLT: 1112°F (Decomposes) UEL: NA LEL: NA	None reported [Note. Measurements may also be made with transmission electron microscopy using NIOSH #7402]	Filter, Acetone/ Triacetin, PCM; III [#7400, Fibers]
Azinphos-methyl C ₁₀ H ₁₂ O ₃ PS ₂ N ₃ 86-50-0 TE1925000	Guthion®; 0,0-Dimethyl-S-4-oxo-1,2,3- benzotriazin-3(4H)- ylmethyl phosphorodithioate; Methyl azinphos [(CH ₃ O) ₂ P(S)SCH ₂ (N ₃ C ₇ H ₄ O)]	NIOSH/OSHA 0.2 mg/m ³ [skin]	20 mg/m ³	Colorless crystals or a brown, waxy solid [insecticide]	MW: 317.3 BP: Decomposes Sol: 0.003% Fl.P: NA IP: ? Sp.Gr. 1.44 Noncombustible Solid	VP: Low MLT: 163°F UEL: NA LEL: NA	Strong oxidizers, acids	None available
2783 55								

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	NIOSH	Inh	Ulceration of nasal septum,	Eye.	Irr immed (15 min)	Liver, kidneys,
Goggles:	Any poss	¥: SCBAF PD,PP/SAF:PD,PP:ASCBA	Abs	derm, GI disturbances,	Skin.	Soap wash immed	skin, lungs,
Wash:	Immed contam/daily	Escape: GMFAGHiE/SCBAE	Con	peri neur, resp irrit,	Swallow.	Medical attention	lymphatic sys
Change:	After work if reason prob contam		Ing	hyperpig of skin, [carc]		immed	
Remove:	Immed contam						
Provide:	Eyewash, quick drench						
Clothing:	N.R.	NIOSH	Inh	Head, malaise, weak,	Breath:	Resp support	Blood, kidneys,
Goggles:	N.R.	¥: SCBAF PD,PP/SAF:PD,PP:ASCBA		dizz; dysp; abdom			liver
Wash:	N.R.	Escape: GMFS/SCBAE		and back pain: nau.			
Change:	N.R.			vomit; bronze skin; hema,			
Remove:	N.R.			jaun, peri neur, [carc]			
Clothing:	Any poss	NIOSH	Inh	Dysp, interstitial fib,	Eye.	Irr immed	Lungs
Goggles:	Reason prob	¥: SCBAF:PD,PP/SAF:PD,PP:ASCBA	Ing	restricted pulm function,			
Wash:	Daily	Escape: HIEF/SCBAE		finger clubbing, [carc]			
Change:	After work if reason prob contam						
Clothing:	Reason prob	NIOSH/OSHA	Inh	Miosis, ache eyes; blurred	Eye:	Irr immed	Resp sys, CNS,
Goggles:	Reason prob	2 mg/m ³ : SA/SCBA/CCROVDMFu	Abs	vision, lac, rhin; head,	Skin	Soap wash immed	CVS, blood chol
Wash:	Immed contam	5 mg/m ³ : PAPROVDMFu/SA:CF	Ing	tight chest, wheez, lar	Breath:	Resp support	
Change:	After work if any poss contam	10 mg/m ³ : CCRFOVHiE/PAPRTOVHiE/ SAT:CF/SCBAF/SAF/ GMFOVHiE	Con	spas, saliv; cyan; anor,	Swallow:	Medical attention	
Remove:	Immed non-imperv contam	20 mg/m ³ : SA:PD,PP		nau, vomit, diarr; sweat;		immed	
Provide:	Quick drench	§ SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOVHiE/SCBAE		twitch, para, convuls, low BP, card irregularities			

Azinphos-methyl

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		
Barium (soluble compounds as Ba) 1: Ba(NO ₃) ₂ 2: BaCl ₂ 1: 10022-31-8/ CQ9625000 2: 10361-37-2/ CQ8750000 1446 42 (Barium nitrate)	1: Barium nitrate, Barium dinitrate 2: Barium chloride, Barium dichloride Synonyms of other soluble compounds vary depend- ing upon the specific com- pound.	NIOSH/OSHA 0.5 mg/m ³	1100 mg/m ³	Barium nitrate & Barium chloride are white odorless solids.	MW: 261.4/ 208.3 BP: Decomposes /2840°F Sol: 9/38% Fl.P: NA/? IP: ?/? Sp.Gr: 3.24/3.86 Ba(NO ₃) ₂ : Noncombustible Solid BaCl ₂ : Combustible Solid	VP: Low/Low MLT: 1098/ 1765°F UEL: NA/? LEL: NA/?	Acids, oxidizers [Note: Contact of barium nitrate with combustible material may cause fire.]	Filter, Water; AA; III [#7056]
Benzene C ₆ H ₆ 71-43-2 CY1400000 1114 27	Benzol, Phenyl hydride 1 ppm = 3.25 mg/m ³	NIOSH Ca See Appendix A 0.1 ppm ST 1 ppm OSHA [1910.1028] 1 ppm ST 5 ppm	Ca [3000 ppm] ACGIH A2	Colorless to light-yellow liquid with an aromatic odor. [Note: A solid below 42°F.]	MW: 78.1 BP: 176°F Sol: 0.07% Fl.P: 12°F IP: 9.24 eV Sp.Gr: 0.88 Class IB Flammable Liquid	VP: 75 mm FRZ: 42°F UEL: 7.9% LEL: 1.3%	Strong oxidizers, many fluorides & perchlorates, nitric acid [Note: Measurements may also be made with a portable GC using NIOSH #3700 (III).]	Char; CS ₂ , GC/FID; III [#1500, Hydro- carbons]
Benzidine NH ₂ C ₆ H ₄ C ₆ H ₄ NH ₂ 92-87-5 DC9625000 1885 53	4,4'-Bianiline; 4,4'-Biphenyldiamine; 1,1'-Biphenyl-4,4'-diamine; 4,4'-Diaminobiphenyl; p-Diaminodiphenyl	NIOSH Ca See Appendix A OSHA [1910.1010] See Appendix B ACGIH A1 [skin]	Ca	Grayish-yellow, reddish-gray, or white crystalline powder.	MW: 184.3 BP: 752°F Sol(54°F): 0.04% Fl.P: ? IP: ? Sp.Gr: 1.25 Combustible Solid, but difficult to burn	VP: Low MLT: 239°F UEL: ? LEL: ?	None reported	Filter/ Si gel, Reagent, HPLC/UVD; III [#5509]
Benzoyl peroxide (C ₆ H ₅ CO) ₂ O ₂ 94-36-0 DM8575000 2085/2086/2087 49 2088/2089/2090 49	Benzoperoxide, Dibenzoyl peroxide	NIOSH/OSHA 5 mg/m ³	7000 mg/m ³	Colorless to white crystals or a granular powder with a faint benzaldehyde-like odor.	MW: 242.2 BP: ? Sol: <1% Fl.P: ? IP: ? Sp.Gr(77°F): 1.33 Combustible Solid (easily ignited and burns very rapidly)	VP: <1 mm MLT: 217°F UEL: ? LEL: ?	Combustible substances (wood, paper, etc.), acids, alkalis, alcohols, amines, ethers [Note: Containers may explode when heated. Extremely explosion-sensitive to shock, heat, and friction.]	Filter; Diethyl ether, HPLC/UVD, III [#5009]

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)
Recommendations vary depending upon the specific compound		NIOSH/OSHA 5 mg/m ³ : DMXSQ/SA/SCBA 12.5 mg/m ³ : PAPRDM/SA/CF 25 mg/m ³ : HiEF/PAPRTHiE/SAT:CF/ SCBAF/SAF 250 mg/m ³ : SAF:PD,PP §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Upper resp irrit; gastroenteritis; musc spasm, slow pulse, extrasystoles, hypokalemia, irrit eyes, skin; skin burns	Eye: Skin: Breath: Swallow: Irr immed Water flush immed Resp support Medical attention immed	Heart, CNS, skin, resp sys, eyes
Clothing: Goggles: Wash: Change: Remove:	Repeat Reason prob Prompt wash soap N.R. Immed wet (flamm)	NIOSH §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, resp sys; gidd; head, nau, staggered gait; ftg, anor, lass; derm; bone marrow depres; [carc]	Eye: Skin: Breath: Swallow: Irr immed Soap wash prompt Resp support Medical attention immed	Blood, CNS, skin, bone marrow, eyes, resp sys
Clothing: Goggles: Wash: Change: Remove: Provide	Any poss Any poss Immed contam/daily After work if any poss contam Immed contam Eyewash, quick drench	NIOSH §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Abs Ing Con	Hema; secondary anemia from hemolysis, acute cystitis; acute liver disorders; derm; painful and irregular urination; [carc]	Eye: Skin: Breath: Swallow: Irr immed (15 min) Soap wash immed Resp support Medical attention immed	Bladder, kidneys, liver, skin, blood
Clothing: Goggles: Wash: Change: Remove:	Repeat Reason prob Prompt contam After work if reason prob contam Prompt non-imperv contam	NIOSH/OSHA 50 mg/m ³ : DMXSQ*/SA*/SCBA* 125 mg/m ³ : PAPRDM*/SA/CF* 250 mg/m ³ : HiEF/SCBAF/SAF/ PAPRTHiE* 7000 mg/m ³ : SAF:PD,PP §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Irrit skin, eyes, muc memb, sens derm	Eye: Skin: Swallow: Irr immed Soap wash prompt Medical attention immed	Skin, resp sys, eyes

Benzoyl 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		
Benzyl chloride <chem>C6H5CH2Cl</chem> 100-44-7 XS8925000	Chloromethylbenzene, alpha-Chlorotoluene	NIOSH C 1 ppm (5 mg/m ³) [15-min] OSHA 1 ppm (5 mg/m ³)	10 ppm	Colorless to slightly yellow liquid with a pungent, aromatic odor	MW: 126.6 BP: 354°F Sol: 0.05% Fl.P: 153°F IP: ?	VP(72°F) 1 mm FRZ: -38°F UEL: ? LEL: 1.1%	Oxidizers, acids, copper, aluminum, magnesium, iron, zinc, tin [Note: Can polymerize when in contact with all common metals except nickel & lead. Hydrolyzes in H ₂ O to benzyl alcohol.]	Char, CS ₂ ; GC/FID; III [#1003, Haloge- nated Hydro- carbons]
1738 59	1 ppm = 5.26 mg/m ³				Sp.Gr. 1.10 Class IIIA Combustible Liquid			
Beryllium and compounds (as Be) Be 7440-41-7 DS1750000 1566 53 (cmpds) 1567 32 (powder)	Metal None Synonyms of other com- pounds vary depending upon the specific com- pound	NIOSH Ca See Appendix A Not to exceed 0.0005 mg/m ³ OSHA 0.002 mg/m ³ C 0.005 mg/m ³ 0.025 mg/m ³ [30-min maximum peak]	Ca [10 mg/m ³] ACGIH A2	Metal: A hard, brittle, gray- white solid.	MW: 9.0 BP: 4532°F Sol: Insoluble Fl.P: NA IP: NA	VP: 0 mm (approx) MLT: 2349°F UEL: NA LEL: NA	Acids, caustics, chlorinated hydro- carbons, oxidizers, molten lithium	Filter; Acid; HGA; III [#7102]
Boron oxide <chem>B2O3</chem> 1303-86-2 ED7900000	Boric anhydride, Boric oxide, Boron trioxide	NIOSH/OSHA 10 mg/m ³	N.E.	Colorless, semi- transparent lumps or hard, white, odorless crystals	MW: 69.6 BP: 3380°F Sol: 3% Fl.P: NA IP: NA	VP: 0 mm (approx) MLT: 842°F UEL: NA LEL: NA	Water [Note: Reacts slowly with water to form boric acid]	Filter, none, Grav. III [#0500, Nuisance Dust (total)]
					Sp.Gr: 2.46 Noncombustible Solid			
Boron trifluoride <chem>BF3</chem> 7637-07-2 ED2275000	Boron fluoride, Trifluoroborane	NIOSH/OSHA C 1 ppm (3 mg/m ³)	100 ppm	Colorless gas with a pungent, suffocating odor [Note: Forms dense white fumes in moist air]	MW: 67.8 BP: -148°F Sol: 106% (in cold H ₂ O) Fl.P: NA IP: 15.50 eV	VP: >1 atm FRZ: -196°F UEL: NA LEL: NA	Alkali metals, calcium oxide [Note: Hydrolyzes in moist air or hot water to form boric acid, hydrogen fluoride, and fluo- boric acid]	None available
1008 15	1 ppm = 2.82 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: Goggles: Wash: Change: Remove: Provide:	Reason prob Any poss Immed contam N.R Immed non-imperv contam Eyewash, quick drench	NIOSH/OSHA 10 ppm: SA*/PAPROVAG*/ CCROVAG*/GMFOVAG/SCBA* §: SCBAF:PD,PP/SAF:PD,PP,ASCBA Escape: GMFOVAG/SCBAE	Inh Ing Con	Irrit eyes, nose; weak; irrit; head; skin eruption; pulm edema	Eye: Skin: Breath: Swallow:	Irr immed Soap wash immed Resp support Medical attention immed	Eyes, resp sys, skin
Clothing: Goggles: Wash: Change: Remove: Provide:	Repeat Any poss Daily After work if any poss contam Prompt non-imperv contam Eyewash	NIOSH ¥. SCBAF:PD,PP/SAF:PD,PP,ASCBA Escape: HiEF/SCBAE	Inh	Resp symptoms, weak, fig, weight loss, [carc]	Eye:	Irr immed	Lungs, skin, eyes, muc memb
Clothing: Goggles: Wash: Change: Remove: Provide:	Repeat Reason prob Prompt contam N.R Prompt non-imperv contam	NIOSH/OSHA 50 mg/m ³ : DM* 100 mg/m ³ : DMXSQ**/SA*/SCBA* 250 mg/m ³ : PAPRDM**/SA:CF* 500 mg/m ³ : SCBAF/SAF/HiEF/ PAPRTHiE* 5000 mg/m ³ : SAF:PD,PP §: SCBAF:PD,PP/SAF:PD,PP,ASCBA Escape: HiEF/SCBAE	Inh Ing Con	Nasal irrit, conj, erythema	Eye: Skin: Breath: Swallow:	Irr immed Water flush prompt Fresh air Medical attention immed	Skin, eyes
Clothing: Goggles: Wash: Change: Remove:	N.R N.R N.R N.R N.R	NIOSH/OSHA 10 ppm: SA*/SCBA* 25 ppm: SA:CF* 50 ppm: SCBAF/SAF 100 ppm: SAF:PD,PP §: SCBAF:PD,PP/SAF:PD,PP,ASCBA Escape: GMFS/SCBAE	Inh Con	Nasal irrit, epis, burns eyes, skin; in animals: pneu; kidney damage; epis	Eye: Skin: Breath:	Irr immed Water flush immed Resp support	Resp sys, kidneys, eyes, skin

Boron trifluoride

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		
Bromine Br ₂ 7726-95-6 EF9100000	Molecular bromine	NIOSH/OSHA 0.1 ppm (0.7 mg/m ³) ST 0.3 ppm (2 mg/m ³)	10 ppm	Dark reddish-brown fuming liquid with suffocating, irritating fumes.	MW. 159.8 BP. 139°F Sol. 4% Fl.P. NA IP: 10 55 eV Sp Gr: 3.12 Noncombustible Liquid, but accelerates the burning of combustibles	VP: 172 mm FRZ: 19°F UEL: NA LEL: NA	Combustible organics (sawdust, wood, cotton, straw, etc.), aluminum, readily oxidizable materials, ammonia, hydrogen, acetylene, phosphorus, potassium, sodium [Note: Corrodes iron, steel, stainless steel & copper]	Bub; none, IC, OSHA [#108]
1744 59	1 ppm = 6.64 mg/m ³							
Bromoform CHBr ₃ 75-25-2 PB5600000	Methyl tribromide, Tribromomethane	NIOSH/OSHA 0.5 ppm (5 mg/m ³) [skin]	Unknown	Colorless to yellow liquid with a chloroform-like odor [Note: A solid below 47°F]	MW 252.8 BP 301°F Sol 0.1% Fl.P. NA IP 10 48 eV Sp Gr: 2.89 Noncombustible Liquid	VP: 5 mm FRZ: 47°F UEL: NA LEL: NA	Lithium, sodium, potassium, calcium, aluminum, zinc, magnesium, strong caustics, acetone [Note: Gradually decomposes, acquir- ing yellow color, air & light accel- erate decomposition]	Char; CS ₂ ; GC/FID, III [#1003, Haloge- nated Hydro- carbons]
2515 58	1 ppm = 10.51 mg/m ³							
1,3-Butadiene CH ₂ =CHCH=CH ₂ 106-99-0 EI9275000	Biethylene, Bivinyll, Butadiene, Divinyll, Erythrene, Vinylethylene	NIOSH Ca See Appendix A Reduce exposure to lowest feasible concentration OSHA 1000 ppm (2200 mg/m ³)	Ca [20,000 ppm] [LEL] ACGIH A2, 10 ppm (22 mg/m ³)	Colorless gas with a mild aromatic or gasoline-like odor. [Note: A liquid below 24°F]	MW 54.1 BP 24°F Sol Insoluble Fl.P. NA (Gas) <0°F (Liquid) IP 9 07 eV Sp.Gr. 0.65(Liquid at 24°F) Flammable Gas Class IA Flammable Liquid	VP >1 atm FRZ: -164°F UEL: 12.0% LEL: 2.0%	Phenol, chlorine dioxide, copper, crotonaldehyde [Note: May contain inhibitors (such as tri-butylcatechol) to prevent self- polymerization. May form explosive peroxides upon exposure to air.]	Char(2); CH ₂ Cl ₂ ; GC/FID; III [#1024]
1010 17 (inhibited)	1 ppm = 2.25 mg/m ³							
2-Butanone CH ₃ COCH ₂ CH ₃ 78-93-3 EL6475000	Ethyl methyl ketone, MEK, Methyl acetone, Methyl ethyl ketone	NIOSH/OSHA 200 ppm (590 mg/m ³) ST 300 ppm (885 mg/m ³)	3000 ppm	Colorless liquid with a moderately sharp, fragrant, mint- or acetone- like odor.	MW 72.1 BP 175°F Sol 28% Fl.P. 16°F IP 9 54 eV Sp.Gr: 0.81 Class IB Flammable Liquid	VP: 71 mm FRZ: -123°F UEL(200°F) 11.4% LEL(200°F). 1.4%	Strong oxidizers, amines, ammonia, inorganic acids, caustics, copper, isocyanates, pyridines	Ambersorb, CS ₂ ; GC/FID; III [#2500]
1193/1232 26	1 ppm = 3.00 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:	Any poss	NIOSH/OSHA	Inh	Dizz, head, lac, epis,	Eye:	Irr immed	Resp sys, eyes,
Goggles:	Any poss	2.5 ppm: SA:CF ⁵ /PAPRS ^{4c}	Ing	cough, feeling of	Skin:	Soap wash immed	CNS
Wash:	Immed contam	5 ppm: CCRFS ⁴ /GMFS ⁴ /SCBAF/SAF	Con	oppression, pulm edema,	Breath:	Resp support	
Change:	N.R.	PAPRTS ^{4c}		pneu; abdom pain, diarr;	Swallow:	Medical attention	
Remove:	Immed contam	10 ppm: SAF:PD,PP		measle-like eruptions;		immed	
Provide:	Eyewash, quick drench	§: SCBAF:PD,PP/SAF:PD,PP:ASCBA		severe burns eyes, skin			
		Escape: GMFS/SCBAE					
Clothing:	Repeat	NIOSH/OSHA	Inh	Irrit eyes, resp sys;	Eye:	Irr immed	Skin, liver,
Goggles:	Reason prob	12.5 ppm: SA:CF ⁵ /PAPROV ⁵	Abs	CNS depression, liver	Skin:	Soap wash prompt	kidneys, resp
Wash:	Prompt contam	25 ppm: CCRFOV/GMFOV/SCBAF/SAF/	Ing	damage	Breath:	Resp support	sys, CNS
Change:	N.R.	PAPRTOV ⁵			Swallow:	Medical attention	
Remove:	Prompt non-imperv	1000 ppm: SAF:PD,PP				immed	
	contam	§: SCBAF:PD,PP/SAF:PD,PP:ASCBA					
		Escape: GMFOV/SCBAE					
Clothing:	Prevent skin freezing	NIOSH	Inh	Irrit eyes, nose, throat,	Eye:	Irr immed	Eyes, resp sys,
Goggles:	Reason prob	§: SCBAF:PD,PP/SAF:PD,PP:ASCBA	Con	drow, li-head,	Skin:	Water flush immed	CNS
Wash:	Immed wet	Escape: GMFS/SCBAE		frostbite, [carc]	Breath:	Resp support	
Change:	N.R.						
Remove:	Immed wet (flamm)						
Clothing:	Repeat	NIOSH/OSHA	Inh	Irrit eyes, nose; head;	Eye:	Irr immed	CNS, lungs
Goggles:	Reason prob	1000 ppm: PAPROV ⁵ /CCRFOV	Ing	dizz, vomit	Skin:	Water wash immed	
Wash:	N.R.	3000 ppm: GMFOV/SA:CF ⁵ /SCBAF/SAF	Con		Breath:	Fresh air	
Change:	N.R.	§: SCBAF:PD,PP/SAF:PD,PP:ASCBA			Swallow:	Medical attention	
Remove:	Prompt non-imperv	Escape: GMFOV/SCBAE				immed	
Provide:	Eyewash						

2-Butanone

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		
2-Butoxyethanol <chem>C4H9OCH2CH2OH</chem> 111-76-2 KJ8575000	Butyl cellosolve, Butyl oxitol, Dowanol EB, Ektasolve EB, Ethylene glycol monobutyl ether, Jeffersol EB	NIOSH/OSHA 25 ppm (120 mg/m ³) [skin]	700 ppm	Colorless mobile liquid with a mild ether-like odor.	MW: 118.2 BP: 339°F Sol: Miscible Fl P: 143°F IP: ?	VP: 0.8 mm FRZ: -107°F UEL(275°F): 12.7% LEL(200°F): 1.1%	Strong oxidizers, strong caustics	Char; Methanol/ <chem>CH2Cl2</chem> ; GC/FID; III [#1403, Alcohols IV]
2369 26	1 ppm = 4.91 mg/m ³				Sp.Gr. 0.90 Class IIIA Combustible Liquid			
n-Butyl acetate <chem>CH3COO[CH2]3CH3</chem> 123-86-4 AF7350000	Butyl acetate, n-Butyl ester of acetic acid, Butyl ethanoate	NIOSH/OSHA 150 ppm (710 mg/m ³) ST 200 ppm (950 mg/m ³)	10,000 ppm	Colorless liquid with a fruity odor.	MW: 116.2 BP: 258°F Sol: 1% Fl P: 72°F IP: 10.00 eV	VP(77°F): 15 mm FRZ: -107°F UEL: 7.6% LEL: 1.7%	Nitrates; strong oxidizers, alkalis & acids	Char; <chem>CS2</chem> ; GC/FID, III [#1450, Esters I]
1123 26	1 ppm = 4.83 mg/m ³				Sp.Gr. 0.88 Class IC Flammable Liquid			
sec-Butyl acetate <chem>CH3COOCH(CH3)-CH2CH3</chem> 105-46-4 AF7380000	sec-Butyl ester of acetic acid, 1-Methylpropyl acetate	NIOSH/OSHA 200 ppm (950 mg/m ³)	10,000 ppm	Colorless liquid with a pleasant, fruity odor.	MW: 116.2 BP: 234°F Sol: 0.8% Fl P: 62°F IP: 9.91 eV	VP(77°F): 24 mm FRZ: -100°F UEL: 9.8% LEL: 1.7%	Nitrates; strong oxidizers, alkalis & acids	Char; <chem>CS2</chem> ; GC/FID, III [#1450, Esters I]
1123 26	1 ppm = 4.83 mg/m ³				Sp.Gr. 0.86 Class IB Flammable Liquid			
tert-Butyl acetate <chem>CH3COOC(CH3)3</chem> 540-88-5 AF7400000	tert-Butyl ester of acetic acid	NIOSH/OSHA 200 ppm (950 mg/m ³)	10,000 ppm	Colorless liquid with a fruity odor	MW: 116.2 BP: 208°F Sol: Insoluble Fl P: 62-72°F IP: ?	VP: ? FRZ: ? UEL: ? LEL: ?	Nitrates; strong oxidizers, alkalis & acids	Char; <chem>CS2</chem> ; GC/FID; III [#1450, Esters I]
1123 26	1 ppm = 4.83 mg/m ³				Sp.Gr. 0.87 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 Reason prob Immed contam N.R. Immed non-imperv contam Quick drench	NIOSH/OSHA 250 ppm: SA*/SCBA* 625 ppm: PAPROV*/SA:CF* 700 ppm: GMFOV/CCRFOV/SCBAF/SAF §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Abs Ing Con	Irrit eyes, nose, throat, hemolysis, hemog	Eye: Skin: Breath: Swallow	Irr immed Soap wash prompt Resp support Medical attention immed	Liver, kidneys, lymphoid sys, skin, blood, eyes, resp sys
Clothing: Goggles: Wash: Change: Remove:	Repeat Reason prob Prompt wet N.R. Immed wet (flamm)	NIOSH/OSHA 1000 ppm: PAPROV*/CCROV* 1500 ppm: SA*/SCBA* 3750 ppm: SA:CF* 7500 ppm: GMFOV/SCBAF/SAF 10,000 ppm: SAF:PD,PP §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Head; drow, dryness and irrit eyes, upper resp sys, skin	Eye: Skin: Breath: Swallow:	Irr immed Water flush prompt Resp support Medical attention immed	Eyes, skin, resp sys
Clothing: Goggles: Wash: Change: Remove:	Repeat Reason prob Prompt wet N.R. Immed wet (flamm)	NIOSH/OSHA 1000 ppm: PAPROV*/CCROV 5000 ppm: SA:CF [†] 10,000 ppm: GMFOV/SCBAF/SAF §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Irrit eyes, head, drow; dryness upper resp sys, skin	Eye: Skin: Breath: Swallow:	Irr immed Water flush prompt Resp support Medical attention immed	Eyes, skin, resp sys
Clothing: Goggles: Wash: Change: Remove:	Repeat Reason prob Prompt wet N.R. Immed wet (flamm)	NIOSH/OSHA 1000 ppm: PAPROV*/CCRFOV 5000 ppm: SA:CF [†] 10,000 ppm: GMFOV/SCBAF/SAF §: SCBAF:PD,PP/SAF:PD,PP:ASCBA Escape: GMFOV/SCBAE	Inh Ing Con	Itch, inflamm eyes, irrit upper resp tract; head; narco, derm	Eye: Skin: Breath: Swallow	Irr immed Water flush prompt Resp support Medical attention immed	Resp sys, eyes, skin

tert-Butyl 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		
n-Butyl alcohol <chem>CH3CH2CH2CH2OH</chem> 71-36-3 EO1400000	1-Butanol, n-Butanol, Butyl alcohol, 1-Hydroxybutane, n-Propyl carbinol	NIOSH/OSHA C 50 ppm (150 mg/m ³) [skin]	8000 ppm	Colorless liquid with a strong, characteristic, mildly alcoholic odor.	MW: 74.1 BP: 243°F Sol: 9% Fl.P: 99°F IP: 10.04 eV	VP: 6 mm FRZ: -129°F UEL: 11.2% LEL: 1.4%	Strong oxidizers	Char; 2-Propanol/ CS ₂ ; GC/FID; III [#1401, Alcohols II]
1120 26	1 ppm = 3.08 mg/m ³				Sp.Gr. 0.81 Class IC Flammable Liquid			
sec-Butyl alcohol <chem>CH3CHOHCH2CH3</chem> 78-92-2 EO1750000	2-Butanol, Butylene hydrate, 2-Hydroxybutane, Methyl ethyl carbinol	NIOSH 100 ppm (305 mg/m ³) ST 150 ppm (455 mg/m ³) OSHA 100 ppm (305 mg/m ³)	10,000 ppm	Colorless liquid with a strong, pleasant odor.	MW: 74.1 BP: 211°F Sol: 16% Fl.P: 75°F IP: 10.10 eV	VP(86°F) 24 mm FRZ: -175°F UEL(212°F): 9.8% LEL(212°F): 1.7%	Strong oxidizers	Char, 2-Propanol/ CS ₂ ; GC/FID; III [#1401, Alcohols II]
1120 26	1 ppm = 3.08 mg/m ³				Sp.Gr. 0.81 Class IC Flammable Liquid			
tert Butyl alcohol <chem>(CH3)3COH</chem> 75-65-0 EO1925000	2 Methyl 2 propanol, Trimethyl carbinol	NIOSH/OSHA 100 ppm (300 mg/m ³) ST 150 ppm (450 mg/m ³)	8000 ppm	Colorless solid or liquid with a camphor-like odor [Note. Pure com- pound is a liquid above 77°F. Often used in aqueous solu- tions.]	MW: 74.1 BP: 180°F Sol: Miscible Fl.P: 52°F IP: 9.70 eV	VP(77°F) 42 mm FRZ: 77°F UEL: 8.0% LEL: 2.4%	Strong mineral acids, strong hydrochloric acid, oxidizers	Char, 2-Butanol/ CS ₂ ; GC/FID; III [#1400, Alcohols I]
1120 26	1 ppm = 3.08 mg/m ³				Sp.Gr. 0.79 Class IB Flammable Liquid			
Butylamine <chem>CH3CH2CH2CH2NH2</chem> 109-73-9 EO2975000	1-Aminobutane, n-Butylamine	NIOSH/OSHA C 5 ppm (15 mg/m ³) [skin]	2000 ppm	Colorless liquid with a fishy, ammonia-like odor	MW: 73.2 BP: 172°F Sol: Miscible Fl.P: 10°F IP: 8.71 eV	VP: 82 mm FRZ: -58°F UEL: 9.8% LEL: 1.7%	Strong oxidizers, strong acids [Note. May corrode some metals in presence of water.]	Si gel; Methanol; GC/FID; II(4) [#S138]
1125 68	1 ppm = 3.04 mg/m ³				Sp.Gr. 0.74 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:	Repeat	NIOSH/OSHA	Inh	Irrit eyes, nose, throat;	Eye	Irr immed	Skin, eyes, resp sys
Goggles:	Reason prob	1000 ppm: PAPROV ⁵ /CCRFOV	Abs	head, verti, drow;	Skin:	Water flush prompt	
Wash:	Prompt wet	1250 ppm: SA:CF ¹	Ing	corneal inflamm, blurred	Breath:	Resp support	
Change:	N.R.	2500 ppm: GMFOV/SCBAF/SAF	Con	vision, lac, photo; dry	Swallow	Medical attention	
Remove:	Immed wet (flamm)	8000 ppm: SAF PD, PP § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOV/SCBAE		cracked skin		immed	
Clothing:	Repeat	NIOSH/OSHA	Inh	Eye irrit, narco	Eye	Irr immed	Eyes, CNS
Goggles:	Reason prob	1000 ppm: PAPROV ⁵ /CCRFOV/ SA ¹ /SCBA ¹	Abs		Skin:	Water flush prompt	
Wash:	Prompt wet	2500 ppm: SA:CF ¹	Ing		Breath:	Resp support	
Change:	N.R.	5000 ppm: GMFOV/SCBAF/SAF	Con		Swallow:	Medical attention	
Remove:	Immed wet (flamm)	10,000 ppm: SAF PD, PP §: SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOV/SCBAE				immed	
Clothing:	Repeat	NIOSH/OSHA	Inh	Drow; irrit skin, eyes	Eye:	Irr immed	Eyes skin
Goggles:	Reason prob	1000 ppm: PAPROV ⁵ /CCRFOV	Ing		Skin:	Water flush prompt	
Wash:	Prompt wet	2500 ppm: SA:CF ¹	Con		Breath:	Resp support	
Change:	N.R.	5000 ppm: GMFOV/SCBAF/SAF			Swallow	Medical attention	
Remove:	Immed wet (flamm)	8000 ppm: SAF PD, PP § SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFOV/SCBAE				immed	
Clothing:	Any poss	NIOSH/OSHA	Inh	Irrit eyes, nose, throat,	Eye:	Irr immed	Resp sys, skin, eyes
Goggles:	Any poss	50 ppm: SA ¹ /SCBA ¹ /CCRS ¹	Abs	head, skin flush, burns	Skin:	Water flush immed	
Wash:	Immed contam	125 ppm: SA:CF ¹ /PAPRS ¹	Ing		Breath:	Resp support	
Change:	N.R.	250 ppm: CCRFS/GMFS/SCBAF/SAF/ PAPRTS ¹	Con		Swallow	Medical attention	
Remove:	Immed wet (flamm)	2000 ppm: SAF PD, PP §: SCBAF PD, PP/SAF PD, PP ASCBA Escape: GMFS/SCBAE				immed	
Provide:	Eyewash, quick drench						

Butylamine