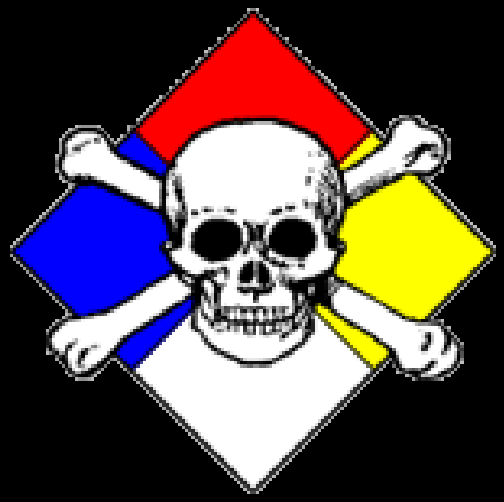
F.N.S.B. HAZMAT



HazMat Size Up

(Street Chemistry)

Instructor – Don Werhonig

- Assistant Chief FNSB HMRT
- Assistant Chief Flint Hills Resources
- Emergency Response Technician

Objectives

- Use chemistry skills without knowing you are using chemistry skills
- Quickly size up a HM incident by using the chemical name
- Verify the size up using TechRefs (NIOSH)
- Build stopping points into SOPs when responding to HMs

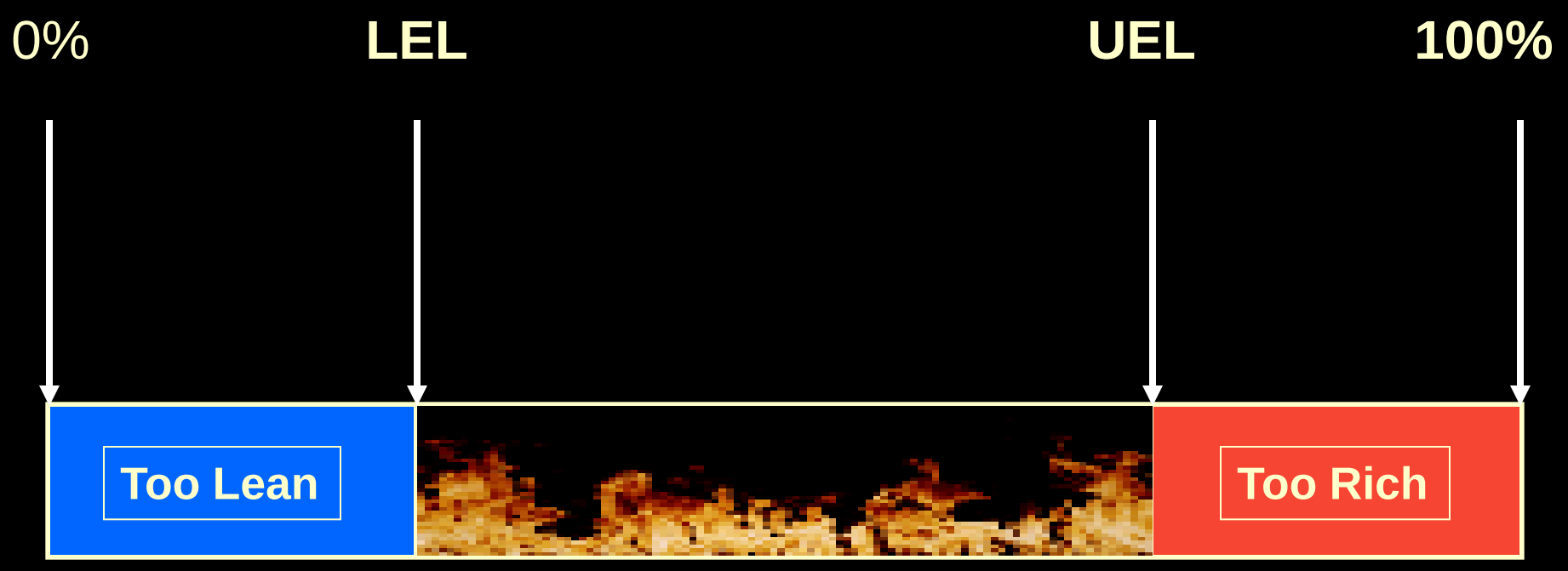
Meter Tool Box

- Bear Paw
  - M8 Chem Tape
  - M9 Chem Paper
  - KI Starch Paper
  - pH Paper
  - F Paper
- CGI (LEL)
- Temp Gun / TIC
- Oxygen Meter
- Rad Detector
- PID
- FID / HC Tube
- Compound Spec Tube
- Compound Spec Meter
- Chem Warfare Detectors

Meter Tool Box

- Bear Paw
  -
  -
  - KI Starch Paper
  - pH Paper
  - F Paper
- CGI (LEL)
- Temp Gun / TIC
- Oxygen Meter
- Rad Detector
-
-
-
-
-

Flammability



Flammability

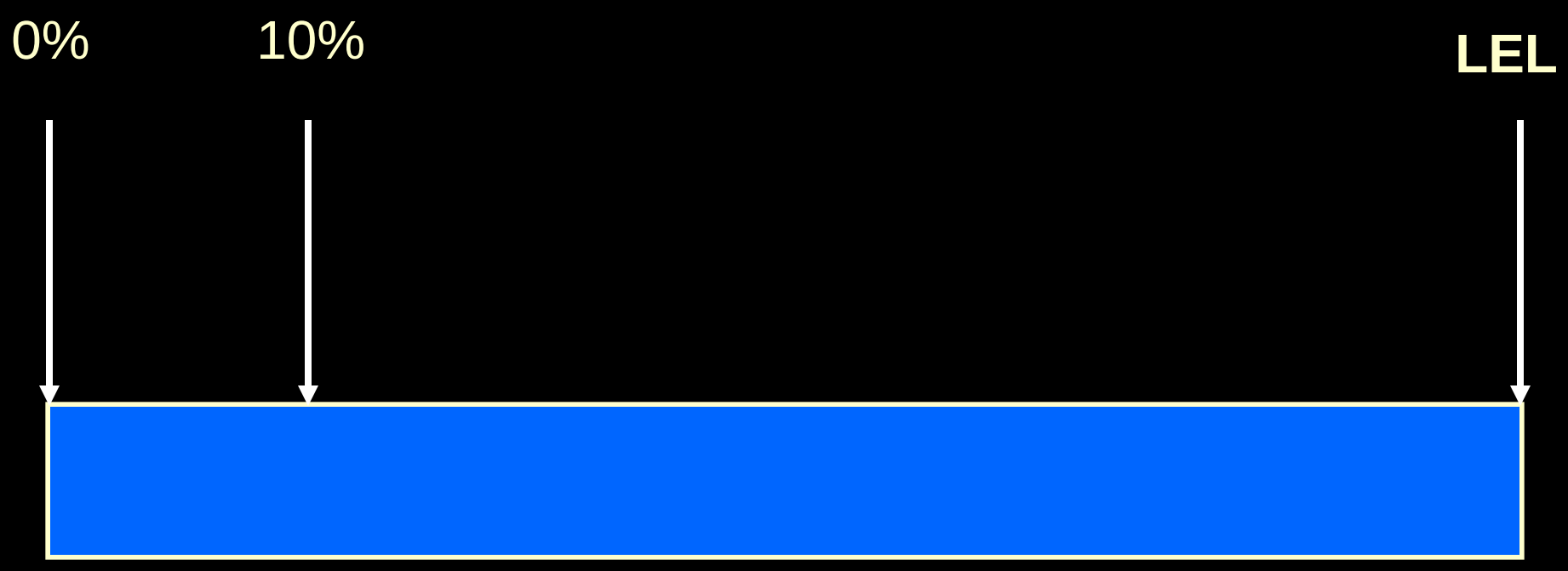


Table of Elements

Hydrogen 1 H																	Helium 2 He
Lithium 3 Li	Beryllium 4 Be											Boron 5 B	Carbon 6 C	Nitrogen 7 N	Oxygen 8 O	Fluorine 9 F	Neon 10 Ne
Sodium 11 Na	Magnesium 12 Mg											Aluminum 13 Al	Silicon 14 Si	Phosphorus 15 P	Sulfur 16 S	Chlorine 17 Cl	Argon 18 Ar
Potassium 19 K	Calcium 20 Ca	Scandium 21 Sc	Titanium 22 Ti	Vanadium 23 V	Chromium 24 Cr	Manganese 25 Mn	Iron 26 Fe	Cobalt 27 Co	Nickel 28 Ni	Copper 29 Cu	Zinc 30 Zn	Galium 31 Ga	Germanium 32 Ge	Arsenic 33 As	Selenium 34 Se	Bromine 35 Br	Krypton 36 Kr
Rubidium 37 Rb	Strontium 38 Sr	Yttrium 39 Y	Zirconium 40 Zr	Niobium 41 Nb	Molybdenum 42 Mo	Technetium 43 Tc	Ruthenium 44 Ru	Rhodium 45 Rh	Palladium 46 Pd	Silver 47 Ag	Cadmium 48 Cd	Indium 49 In	Tin 50 Sn	Antimony 51 Sb	Tellurium 52 Te	Iodine 53 I	Xenon 54 Xe
Cesium 55 Cs	Barium 56 Ba	Lanthanum 57 La	Hafnium 72 Hf	Tantalum 73 Ta	Tungsten 74 W	Rhenium 75 Re	Osmium 76 Os	Iridium 77 Ir	Platinum 78 Pt	Gold 79 Au	Mercury 80 Hg	Thallium 81 Ti	Lead 82 Pb	Bismuth 83 Bi	Polonium 84 Po	Astatine 85 At	Radon 86 Rn

Acidic

Neutral

Caustic

LEVEL A FREONS

Water Reactive

Blue SOG	**Red SOG**
75’ Isolation	300’ Isolation
Solid – dust heavier than air	Gas or Liquid - Vapors heavier than air
Not Flammable	Flammable
No LEL, UEL, or FP	LEL, UEL, and FP
No polymerize	Polymer
No Ionization Potential	Ionization Potential
Caustic	Acidic
Radioactive	Radioactive
Toxic	Toxic

Below the Neutral Line	Above the Neutral Line
75’ Isolation	300’ Isolation
Solid – dust heavier than air	Gas or Liquid - Vapors heavier than air
Not Flammable	Flammable
No LEL, UEL, or FP	LEL, UEL, and FP
No polymerize	Polymer
No Ionization Potential	Ionization Potential
Caustic	Acidic
Radioactive	Radioactive
Toxic	Toxic

Below the Neutral Line

75’ Isolation

Solid – dust heavier than air

Not Flammable

- No LEL, UEL, or FP
- No polymerize

No Ionization Potential

Caustic

Radioactive

Toxic

Stopping Point

Below the Neutral Line **Stopping Point**

75’ Isolation

Solid – dust heavier than air

Gas or Liquid

Not Flammable

- No LEL, UEL, or FP
- No polymerize

No Ionization Potential

Caustic

Radioactive

Toxic

Below the Neutral Line	**Stopping Point**
75’ Isolation	
Solid – dust heavier than air	Gas or Liquid
Not Flammable No LEL, UEL, or FP No polymerize	Flammable (CGI, KI paper)
No Ionization Potential	
Caustic	
Radioactive	
Toxic	

Below the Neutral Line	**Stopping Point**
75’ Isolation	
Solid – dust heavier than air	Gas or Liquid
Not Flammable No LEL, UEL, or FP No polymerize	Flammable (CGI, KI paper) Increase in temp (temp gun / TIC)
No Ionization Potential	
Caustic	
Radioactive	
Toxic	

Below the Neutral Line	Stopping Point
75’ Isolation	
Solid – dust heavier than air	Gas or Liquid
Not Flammable No LEL, UEL, or FP No polymerize	Flammable (CGI, KI paper)
No Ionization Potential	Increase in temp (temp gun / TIC)
Caustic	Acidic, pH, F paper
Radioactive	
Toxic	

Below the Neutral Line	Stopping Point
75’ Isolation	
Solid – dust heavier than air	Gas or Liquid
Not Flammable No LEL, UEL, or FP No polymerize	Flammable (CGI, KI paper)
No Ionization Potential	Increase in temp (temp gun / TIC)
Caustic	Acidic, pH, F paper
Radioactive	Radioactive
Toxic	

Above the Neutral Line

300’ Isolation

Gas or Liquid - Vapors heavier than air

Flammable

- LEL, UEL, and FP
- Polymer

Ionization Potential

Acidic

Radioactive

Toxic

Stopping Point

Above the Neutral Line	Stopping Point
300’ Isolation Gas or Liquid - Vapors heavier than air Flammable LEL, UEL, and FP Polymer Ionization Potential Acidic Radioactive Toxic	Above 10% LEL

Above the Neutral Line	Stopping Point
300’ Isolation	
Gas or Liquid - Vapors heavier than air	
Flammable	Above 10% LEL
LEL, UEL, and FP	KI paper
Polymer	
Ionization Potential	
Acidic	
Radioactive	
Toxic	

Above the Neutral Line	Stopping Point
300’ Isolation	
Gas or Liquid - Vapors heavier than air	
Flammable	Above 10% LEL
LEL, UEL, and FP	KI paper
Polymer	Increase in temp (temp gun / TIC)
Ionization Potential	
Acidic	
Radioactive	
Toxic	

Above the Neutral Line	Stopping Point
300’ Isolation	
Gas or Liquid - Vapors heavier than air	
Flammable	Above 10% LEL
LEL, UEL, and FP	KI paper
Polymer	Increase in temp (temp gun / TIC)
Ionization Potential	pH, F paper
Acidic	
Radioactive	
Toxic	

Above the Neutral Line	Stopping Point
300’ Isolation	
Gas or Liquid - Vapors heavier than air	
Flammable	Above 10% LEL
LEL, UEL, and FP	KI paper
Polymer	Increase in temp (temp gun / TIC)
Ionization Potential	
Acidic	pH, F paper
Radioactive	Radioactive
Toxic	

The Mission

Rescue

- Line of site
- Quick in and out

Recon

Public Protection

Never break a stopping point if there is a positive hit on the F paper!

Use turnouts any time the CGI is >10% LEL

Benzene	Formula: C_6H_6	CAS#: 71-43-2	RTECS#: CY1400000	IDLH: Ca [500 ppm]
Conversion: 1 ppm = 3.19 mg/m^3	DOT: 1114 130			

Synonyms/Trade Names: Benzol, Phenyl hydride

Exposure Limits:

NIOSH REL: Ca
TWA 0.1 ppm
ST 1 ppm
See Appendix A

OSHA PEL: [1910.1028]
TWA 1 ppm
ST 5 ppm
See Appendix F

Measurement Methods (see Table 1):
NIOSH 1500, 1501, 3700, 3800
OSHA 12, 1005

Physical Description: Colorless to light-yellow liquid with an aromatic odor. [**Note:** A solid below 42°F.]

Chemical & Physical Properties:
MW: 78.1
BP: 176°F
Sol: 0.07%
Fl.P: 12°F
IP: 9.24 eV
Sp.Gr: 0.88
VP: 75 mmHg
FRZ: 42°F
UEL: 7.8%
LEL: 1.2%
Class IB Flammable Liquid

Personal Protection/Sanitation (see Table 2):
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contam
Remove: When wet (flamm)
Change: N.R.
Provide: Eyewash
Quick drench

Respirator Recommendations (see Tables 3 and 4):
NIOSH
¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: GmFOv/ScbaE

See Appendix E (page 351)

Incompatibilities and Reactivities: Strong oxidizers, many fluorides & perchlorates, nitric acid

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Abs, Ing, Con
SY: Irrit eyes, skin, nose, resp sys; dizz; head, nau, staggered gait; anor, lass; derm; bone marrow depres; [carc]
TO: Eyes, skin, resp sys, blood, CNS, bone marrow [leukemia]

First Aid (see Table 6):
Eye: Irr immed
Skin: Soap wash immed
Breath: Resp support
Swallow: Medical attention immed

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ST 5 ppm
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Synonyms/Trade Names: Benzol, Phenyl hydride

Exposure Limits:

NIOSH REL: Ca
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ST 1 ppm
See Appendix A

OSHA PEL: [illegible]0.1028]
T[illegible]A 1 ppm
[illegible]5 ppm
[illegible] Appendix F

Measurement Methods (see Table 1):
NIOSH 1500, 1501, 3700, 3800
OSHA 12, 1005

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Class IB Flammable Liquid

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Escape: GmFOv/ScbaE

See Appendix E (page 351)

MW = Molecular Weight
BP = Boiling Point
Sol = Solubility in water
Fl.P = Flash Point
IP = Ionization Potential
Sp. Gr = Specific Gravity
VP = Vapor Pressure
FRZ = Freeze Point
UEL = Upper Explosive Limit
LEL = Lower Explosive Limit

Incompatibilities and R… …s & perchlorates, nitric acid

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LEL: 1.2%
Class IB Flammable Liquid

Personal Protection/Sanitation (see Table 2):
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contam
Remove: When wet (flamm)
Change: N.R.
Provide: Eyewash
Quick drench

Respirator Recommendations (see Tables 3 and 4):
NIOSH
¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: GmFOv/ScbaE

See Appendix E (page 351)

Incompatibilities and Reactivities: Strong oxidizers, many fluorides & perchlorates, nitric acid

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Abs, Ing, Con
SY: Irrit eyes, skin, nose, resp sys; dizz; head, nau, staggered gait; anor, lass; derm; bone marrow depres; [carc]
TO: Eyes, skin, resp sys, blood, CNS, bone marrow [leukemia]

First Aid (see Table 6):
Eye: Irr immed
Skin: Soap wash immed
Breath: Resp support
Swallow: Medical attention immed

Gasoline	Formula:	CAS#: 8006-61-9	RTECS#: LX3300000	IDLH: Ca [N.D.]
Conversion: 1 ppm = 4.5 mg/m^3 (approx)	DOT: 1203 128			

Synonyms/Trade Names: Motor fuel, Motor spirits, Natural gasoline, Petrol
[**Note:** A complex mixture of volatile hydrocarbons (paraffins, cycloparaffins & aromatics).]

Exposure Limits:
NIOSH REL: Ca
See Appendix A
OSHA PEL†: none

Measurement Methods (see Table 1):
OSHA PV2028

Physical Description: Clear liquid with a characteristic odor.

Chemical & Physical Properties:
MW: 110 (approx)
BP: 102°F
Sol: Insoluble
Fl.P: -45°F
IP: ?
Sp.Gr(60°F): 0.72-0.76
VP: 38-300 mmHg
FRZ: ?
UEL: 7.6%
LEL: 1.4%
Class IB Flammable Liquid

Personal Protection/Sanitation (see Table 2):
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contam
Remove: When wet (flamm)
Change: N.R.
Provide: Eyewash
Quick drench

Respirator Recommendations (see Tables 3 and 4):
NIOSH
¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: GmFOv/ScbaE

Incompatibilities and Reactivities: Strong oxidizers such as peroxides, nitric acid & perchlorates

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Abs, Ing, Con
SY: Irrit eyes, skin, muc memb; derm; head, lass, blurred vision, dizz, slurred speech, conf, convuls; chemical pneu (aspir liquid); possible liver, kidney damage; [carc]
TO: Eyes, skin, resp sys, CNS, liver, kidneys [in animals: liver & kidney cancer]

First Aid (see Table 6):
Eye: Irr immed
Skin: Soap flush immed
Breath: Resp support
Swallow: Medical attention immed

Ethyleneimine	Formula: C_2H_5N	CAS#: 151-56-4	RTECS#: KX5075000	IDLH: Ca [100 ppm]
Conversion: 1 ppm = 1.76 mg/m^3	DOT: 1185 131P (inhibited)			

Synonyms/Trade Names: Aminoethylene, Azirane, Aziridine, Dimethyleneimine, Dimethylenimine, Ethylenimine, Ethylimine

Exposure Limits:
NIOSH REL: Ca
See Appendix A
OSHA PEL: [1910.1012] See Appendix B

Physical Description: Colorless liquid with an ammonia-like odor.
[**Note:** Usually contains inhibitors to prevent polymerization.]

Measurement Methods (see Table 1):
NIOSH 3514

Chemical & Physical Properties:
MW: 43.1
BP: 133°F
Sol: Miscible
Fl.P: 12°F
IP: 9.20 eV
Sp.Gr: 0.83
VP: 160 mmHg
FRZ: -97°F
UEL: 54.8%
LEL: 3.3%
Class IB Flammable Liquid

Personal Protection/Sanitation (see Table 2):
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contam/Daily
Remove: When wet or contam
Change: Daily
Provide: Eyewash
Quick drench

Respirator Recommendations (see Tables 3 and 4):
NIOSH
¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: GmFOv/ScbaE

See Appendix E (page 351)

Incompatibilities and Reactivities: Polymerizes explosively in presence of acids [**Note:** Explosive silver derivatives may be formed with silver alloys (e.g., silver solder).]

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Abs, Ing, Con
SY: Irrit eyes, skin, nose, throat; nau, vomit; head, dizz; pulm edema; liver, kidney damage; eye burns; skin sens; [carc]
TO: Eyes, skin, resp sys, liver, kidneys [in animals: lung & liver tumors]

First Aid (see Table 6):
Eye: Irr immed
Skin: Soap wash immed
Breath: Resp support
Swallow: Medical attention immed

Ethyleneimine	Formula: C_2H_5N	CAS#: 151-56-4	RTECS#: KX5075000	IDLH: Ca [100 ppm]
Conversion: 1 ppm = 1.76 mg/m^3	DOT: 1185 131P (inhibited)			

Synonyms/Trade Names: Aminoethylene, Azirane, Aziridine, Dimethyleneimine, Dimethylenimine, Ethylenimine, Ethylimine

Exposure Limits:
NIOSH REL: Ca
See Appendix A
OSHA PEL: [1910.1012] See Appendix B

Measurement Methods (see Table 1):
NIOSH 3514

Physical Description: Colorless liquid with an ammonia-like odor.
[**Note:** Usually contains inhibitors to prevent polymerization.]

Chemical & Physical Properties:
MW: 43.1
BP: 133°F
Sol: Miscible
Fl.P: 12°F
IP: 9.20 eV
Sp.Gr: 0.83
VP: 160 mmHg
FRZ: -97°F
UEL: 54.8%
LEL: 3.3%
Class IB Flammable Liquid

Person Protection/Sanitation (see Table 2):
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contam/Daily
Remove: When wet or contam
Change: Daily
Provide: Eyewash
Quick drench

Respirator Recommendations (see Tables 3 and 4):
NIOSH
¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: GmFOv/ScbaE

See Appendix E (page 351)

Incompatibilities and Reactivities: Polymerizes explosively in presence of acids [**Note:** Explosive silver derivatives may be formed with silver alloys (e.g., silver solder).]

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Abs, Ing, Con
SY: Irrit eyes, skin, nose, throat; nau, vomit; head, dizz; pulm edema; liver, kidney damage; eye burns; skin sens; [carc]
TO: Eyes, skin, resp sys, liver, kidneys [in animals: lung & liver tumors]

First Aid (see Table 6):
Eye: Irr immed
Skin: Soap wash immed
Breath: Resp support
Swallow: Medical attention immed

Ethyleneimine	Formula: C_2H_5N	CAS#: 151-56-4	RTECS#: KX5075000	IDLH: Ca [100 ppm]
Conversion: 1 ppm = 1.76 mg/m^3	DOT: 1185 131P (inhibited)			

Synonyms/Trade Names: Aminoethylene, Azirane, Aziridine, Dimethyleneimine, Dimethylenimine, Ethylenimine, Ethylimine

Exposure Limits:
NIOSH REL: Ca
See Appendix A
OSHA PEL: [1910.1012] See Appendix B

Measurement Methods (see Table 1):
NIOSH 3514

Physical Description: Colorless liquid with an ammonia-like odor.
[**Note:** Usually contains inhibitors to prevent polymerization.]

Chemical & Physical Properties:
MW: 43.1
BP: 133°F
Sol: Miscible
Fl.P: 12°F
IP: 9.20 eV
Sp.Gr: 0.83
VP: 160 mmHg
FRZ: -97°F
UEL: 54.8%
LEL: 3.3%
Class IB Flammable Liquid

Personal Protection/Sanitation (see Table 2):
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contam/Daily
Remove: When wet or contam
Change: Daily
Provide: Eyewash
Quick drench

Respirator Recommendations (see Tables 3 and 4):
NIOSH
¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: GmFOv/ScbaE

See Appendix E (page 351)

Incompatibilities and Reactivities: Polymerizes explosively in presence of acids [**Note:** Explosive silver derivatives may be formed with silver alloys (e.g., silver solder).]

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Abs, Ing, Con
SY: Irrit eyes, skin, nose, throat; nau, vomit; head, dizz; pulm edema; liver, kidney damage; eye burns; skin sens; [carc]
TO: Eyes, skin, resp sys, liver, kidneys [in animals: lung & liver tumors]

First Aid (see Table 6):
Eye: Irr immed
Skin: Soap wash immed
Breath: Resp support
Swallow: Medical attention immed

Allyl alcohol	Formula: $CH_2=CHCH_2OH$	CAS#: 107-18-6	RTECS#: BA5075000	IDLH: 20 ppm
Conversion: 1 ppm = 2.38 mg/m^3	DOT: 1098 131			

Synonyms/Trade Names: AA, Allylic alcohol, Propenol, 1-Propen-3-ol, 2-Propenol, Vinyl carbinol

Exposure Limits:
NIOSH REL: TWA 2 ppm (5 mg/m^3)
ST 4 ppm (10 mg/m^3) [skin]
OSHA PEL†: TWA 2 ppm (5 mg/m^3) [skin]

Measurement Methods (see Table 1):
NIOSH 1402, 1405

Physical Description: Colorless liquid with a pungent, mustard-like odor.

Chemical & Physical Properties:
MW: 58.1
BP: 205°F
Sol: Miscible
Fl.P: 70°F
IP: 9.63 eV
Sp.Gr: 0.85
VP: 17 mmHg
FRZ: -200°F
UEL: 18.0%
LEL: 2.5%
Class IB Flammable Liquid

Personal Protection/Sanitation (see Table 2):
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contam
Remove: When wet (flamm)
Change: N.R.
Provide: Quick drench

Respirator Recommendations (see Tables 3 and 4):
NIOSH/OSHA
20 ppm: Sa:Cf*/PaprOv*/CcrFOv/GmFOv/ScbaF/SaF
§: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: GmFOv/ScbaE

Incompatibilities and Reactivities: Strong oxidizers, acids, carbon tetrachloride
[**Note:** Polymerization may be caused by elevated temperatures, oxidizers, or peroxides.]

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Abs, Ing, Con
SY: Eye irrit, tissue damage; irrit upper resp sys, skin; pulm edema
TO: Eyes, skin, resp sys

First Aid (see Table 6):
Eye: Irr immed
Skin: Water flush immed
Breath: Resp support
Swallow: Medical attention immed

Allyl alcohol	Formula: $CH_2=CHCH_2OH$	CAS#: 107-18-6	RTECS#: BA5075000	IDLH: 20 ppm
Conversion: 1 ppm = 2.38 mg/m^3	DOT: 1098 131			

Synonyms/Trade Names: AA, Allylic alcohol, Propenol, 1-Propen-3-ol, 2-Propenol, Vinyl carbinol

Exposure Limits:
NIOSH REL: TWA 2 ppm (5 mg/m^3)
ST 4 ppm (10 mg/m^3) [skin]
OSHA PEL†: TWA 2 ppm (5 mg/m^3) [skin]

Measurement Methods (see Table 1):
NIOSH 1402, 1405

Physical Description: Colorless liquid with a pungent, mustard-like odor.

Chemical & Physical Properties:
MW: 58.1
BP: 205°F
Sol: Miscible
Fl.P: 70°F
IP: 9.63 eV
Sp.Gr: 0.85
VP: 17 mmHg
FRZ: -200°F
UEL: 18.0%
LEL: 2.5%
Class IB Flammable Liquid

Personal Protection/Sanitation (see Table 2):
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contam
Remove: When wet (flamm)
Change: N.R.
Provide: Quick drench

Respirator Recommendations (see Tables 3 and 4):
NIOSH/OSHA
20 ppm: Sa:Cf*/PaprOv*/CcrFOv/GmFOv/ScbaF/SaF
§: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: GmFOv/ScbaE

Incompatibilities and Reactivities: Strong oxidizers, acids, carbon tetrachloride
[**Note:** Polymerization may be caused by elevated temperatures, oxidizers, or peroxides.]

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Abs, Ing, Con
SY: Eye irrit, tissue damage; irrit upper resp sys, skin; pulm edema
TO: Eyes, skin, resp sys

First Aid (see Table 6):
Eye: Irr immed
Skin: Water flush immed
Breath: Resp support
Swallow: Medical attention immed

Allyl alcohol	Formula: $CH_2=CHCH_2OH$	CAS#: 107-18-6	RTECS#: BA5075000	IDLH: 20 ppm

Conversion: 1 ppm = 2.38 mg/m^3

D[illegible]T: 1098 131

Synonyms/Trade Names: AA, Allylic alcohol, [illegible]enol, 1-Propen-3-ol, 2-Propenol, Vinyl carbinol

Exposure Limits:
NIOSH REL: TWA 2 ppm (5 mg/m^3)
ST 4 ppm (10 mg/m^3) [skin]
OSHA PEL†: TWA 2 ppm (5 mg/m^3) [ski[illegible]

Measurement Methods (see Table 1):
NIOSH 1402, 1405

Physical Description: Colorless liquid [illegible]h a pungent, mustard-like odor.

Chemical & Physical Properties:
MW: 58.1
BP: 205°F
Sol: Miscible
Fl.P: 70°F
IP: 9.63 eV
Sp.Gr: 0.85
VP: 17 mmHg
FRZ: -200°F
UEL: 18.0%
LEL: 2.5%
Class IB Fl[illegible]able Liquid

[illegible]rsonal Protection/Sanitation (see Table 2):
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contam
Remove: When wet (flamm)
Change: N.R.
Provide: Quick drench

Respirator Recommendations (see Tables 3 and 4):
NIOSH/OSHA
20 ppm: Sa:Cf*/PaprOv*/CcrFOv/GmFOv/ScbaF/SaF
§: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: GmFOv/ScbaE

Incompati[illegible]ities and Reactivities: Strong oxidizers, acids, carbon tetrachloride
[**Note:** Polymerization may be caused by elevated temperatures, oxidizers, or peroxides.]

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Abs, Ing, Con
SY: Eye irrit, tissue damage; irrit upper resp sys, skin; pulm edema
TO: Eyes, skin, resp sys

First Aid (see Table 6):
Eye: Irr immed
Skin: Water flush immed
Breath: Resp support
Swallow: Medical attention immed

Methyl acetylene	Formula: $CH_3C{\equiv}CH$	CAS#: 74-99-7	RTECS#: UK4250000	IDLH: 1700 ppm [10%LEL]
Conversion: 1 ppm = 1.64 mg/m^3	DOT:			

Synonyms/Trade Names: Allylene, Propine, Propyne, 1-Propyne

Exposure Limits:
NIOSH REL: TWA 1000 ppm (1650 mg/m^3)
OSHA PEL: TWA 1000 ppm (1650 mg/m^3)

Measurement Methods (see Table 1):
NIOSH S84 (II-5)

Physical Description: Colorless gas with a sweet odor.
[**Note:** A fuel that is shipped as a liquefied compressed gas.]

Chemical & Physical Properties:
MW: 40.1
BP: -10°F
Sol: Insoluble
Fl.P: NA (Gas)
IP: 10.36 eV
RGasD: 1.41
VP: 5.2 atm
FRZ: -153°F
UEL: ?
LEL: 1.7%
Flammable Gas

Personal Protection/Sanitation (see Table 2):
Skin: Frostbite
Eyes: Frostbite
Wash skin: N.R.
Remove: When wet (flamm)
Change: N.R.
Provide: Frostbite wash

Respirator Recommendations (see Tables 3 and 4):
NIOSH/OSHA
1700 ppm: Sa/ScbaF
§: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: GmFOv/ScbaE

Incompatibilities and Reactivities: Strong oxidizers (such as chlorine), copper alloys
[**Note:** Can decompose explosively at 4.5 to 5.6 atmospheres of pressure.]

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Con (liquid)
SY: Irrit resp sys; tremor, hyperexcitability, anes; liquid: frostbite
TO: Resp sys, CNS

First Aid (see Table 6):
Eye: Frostbite
Skin: Frostbite
Breath: Resp support

Hydrogen fluoride	Formula: HF	CAS#: 7664-39-3	RTECS#: MW7875000	IDLH: 30 ppm

Conversion: 1 ppm = 0.82 mg/m^3

DOT: 1052 125 (anhydrous); 1790 157 (solution)

Synonyms/Trade Names: Anhydrous hydrogen fluoride; Aqueous hydrogen fluoride (i.e., Hydrofluoric acid); HF-A

Exposure Limits:
NIOSH REL: TWA 3 ppm (2.5 mg/m^3)
C 6 ppm (5 mg/m^3) [15-minute]
OSHA PEL†: TWA 3 ppm

Measurement Methods (see Table 1):
NIOSH 3800, 7902, 7903, 7906
OSHA ID110

Physical Description: Colorless gas or fuming liquid (below 67°F) with a strong, irritating odor. [**Note:** Shipped in cylinders.]

Chemical & Physical Properties:
MW: 20.0
BP: 67°F
Sol: Miscible
Fl.P: NA
IP: 15.98 eV
RGasD: 0.69
Sp.Gr: 1.00 (Liquid at 67°F)
VP: 783 mmHg
FRZ: -118°F
UEL: NA
LEL: NA
Nonflammable Gas

Personal Protection/Sanitation (see Table 2):
Skin: Prevent skin contact (liquid)
Eyes: Prevent eye contact (liquid)
Wash skin: When contam (liquid)
Remove: When wet or contam (liquid)
Change: N.R.
Provide: Eyewash (liquid)
Quick drench (liquid)

Respirator Recommendations (see Tables 3 and 4):
NIOSH/OSHA
30 ppm: CcrS*/PaprS*/GmFS/Sa*/ScbaF
§: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: GmFS/ScbaE

Incompatibilities and Reactivities: Metals, water or steam
[**Note:** Corrosive to metals. Will attack glass and concrete.]

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Abs (liquid), Ing (solution), Con
SY: Irrit eyes, skin, nose, throat; pulm edema; eye, skin burns; rhinitis; bron; bone changes
TO: Eyes, skin, resp sys, bones

First Aid (see Table 6):
Eye: Irr immed (solution/liquid)
Skin: Water flush immed (solution/liquid)
Breath: Resp support
Swallow: Medical attention immed (solution)

Calcium carbonate	Formula: $CaCO_3$	CAS#: 471-34-1 (synthetic) 1317-65-3 (natural)	RTECS#: EV9580000	IDLH: N.D.
Conversion:	DOT:			

Synonyms/Trade Names: Calcium salt of carbonic acid
[**Note:** Occurs in nature as as limestone, chalk, marble, dolomite, aragonite, calcite & oyster shells.]

Exposure Limits:
NIOSH REL: TWA 10 mg/m^3 (total)
TWA 5 mg/m^3 (resp)
OSHA PEL: TWA 15 mg/m^3 (total)
TWA 5 mg/m^3 (resp)

Measurement Methods (see Table 1):
NIOSH 7020, 7303
OSHA ID121

Physical Description: White, odorless powder or colorless crystals.

Chemical & Physical Properties:
MW: 100.1
BP: Decomposes
Sol: 0.001%
Fl.P: NA
IP: NA
Sp.Gr: 2.7-2.95
VP: 0 mmHg (approx)
MLT: 1517-2442°F (Decomposes)
UEL: NA
LEL: NA
Noncombustible Solid

Personal Protection/Sanitation (see Table 2):
Skin: N.R.
Eyes: N.R.
Wash skin: N.R.
Remove: N.R.
Change: N.R.

Respirator Recommendations (see Tables 3 and 4):
Not available.

Incompatibilities and Reactivities: Acids, alum, ammonium salts, mercury & hydrogen, fluorine, magnesium

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Con
SY: Irrit eyes, skin, resp sys; cough
TO: Eyes, skin, resp sys

First Aid (see Table 6):
Eye: Irr immed
Skin: Soap wash
Breath: Fresh air

Carbon disulfide	Formula: CS_2	CAS#: 75-15-0	RTECS#: FF6650000	IDLH: 500 ppm
Conversion: 1 ppm = 3.11 mg/m^3	DOT: 1131 131			

Synonyms/Trade Names: Carbon bisulfide

Exposure Limits:
NIOSH REL: TWA 1 ppm (3 mg/m^3)
ST 10 ppm (30 mg/m^3) [skin]
OSHA PEL†: TWA 20 ppm
C 30 ppm
100 ppm (30-minute maximum peak)

Measurement Methods (see Table 1):
NIOSH 1600, 3800

Physical Description: Colorless to faint-yellow liquid with a sweet ether-like odor. [**Note:** Reagent grades are foul smelling.]

Chemical & Physical Properties:
MW: 76.1
BP: 116°F
Sol: 0.3%
Fl.P: -22°F
IP: 10.08 eV
Sp.Gr: 1.26
VP: 297 mmHg
FRZ: -169°F
UEL: 50.0%
LEL: 1.3%
Class IB Flammable Liquid

Personal Protection/Sanitation (see Table 2):
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contam
Remove: When wet (flamm)
Change: N.R.

Respirator Recommendations (see Tables 3 and 4):
NIOSH
10 ppm: CcrOv/Sa
25 ppm: Sa:Cf/PaprOv
50 ppm: CcrFOv/GmFOv/PaprTOv/ ScbaF/SaF
500 ppm: Sa:Pd,Pp
§: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: GmFOv/ScbaE

Incompatibilities and Reactivities: Strong oxidizers; chemically-active metals such as sodium, potassium & zinc; azides; rust; halogens; amines [**Note:** Vapors may be ignited by contact with an ordinary light bulb.]

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Abs, Ing, Con
SY: Dizz, head, poor sleep, lass, anxi, anor, low-wgt; psychosis; polyneur; Parkinson-like syndrome; ocular changes; coronary heart disease; gastritis; kidney, liver inj; eye, skin burns; derm; repro effects
TO: CNS, PNS, CVS, eyes, kidneys, liver, skin, repro sys

First Aid (see Table 6):
Eye: Irr immed
Skin: Soap wash immed
Breath: Resp support
Swallow: Medical attention immed

Methyl parathion	Formula: $(CH_3O)_2P(S)OC_6H_4NO_2$	CAS#: 298-00-0	RTECS#: TG0175000	IDLH: N.D.
Conversion:	DOT: 2783 152 (solid); 3018 152 (liquid)			

Synonyms/Trade Names: Azophos®; O,O-Dimethyl-O-p-nitrophenylphosphorothioate; Parathion methyl

Exposure Limits:
NIOSH REL: TWA 0.2 mg/m^3 [skin]
OSHA PEL†: none

Measurement Methods (see Table 1):
NIOSH 5600
OSHA PV2112

Physical Description: White to tan, crystalline solid or powder with a pungent, garlic-like odor. [pesticide] [**Note:** The commercial product in xylene is a tan liquid.]

Chemical & Physical Properties:
MW: 263.2
BP: 289°F
Sol(77°F): 0.006%
Fl.P: ?
IP: ?
Sp.Gr: 1.36
VP: 0.00001 mmHg
MLT: 99°F
UEL: ?
LEL: ?
Combustible Solid

Personal Protection/Sanitation (see Table 2):
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contam/Daily
Remove: When wet or contam
Change: Daily
Provide: Eyewash
Quick drench

Respirator Recommendations (see Tables 3 and 4):
NIOSH
2 mg/m^3: CcrOv95/Sa
5 mg/m^3: Sa:Cf/PaprOvHie
10 mg/m^3: CcrFOv100/GmFOv100/PaprTOvHie/SaT:Cf/ScbaF/SaF
200 mg/m^3: SaF:Pd,Pp
§: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: GmFOv100/ScbaE

Incompatibilities and Reactivities: Strong oxidizers, water [**Note:** Explosive risk when heated above 122°F.]

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Abs, Ing, Con
SY: Irrit eyes, skin; nau, vomit, abdom cramps, diarr, salv; head, dizz, lass; rhin, chest tight; blurred vision, miosis; card irreg; musc fasc; dysp
TO: Eyes, skin, resp sys, CNS, CVS, blood chol

First Aid (see Table 6):
Eye: Irr immed
Skin: Soap wash immed
Breath: Resp support
Swallow: Medical attention immed

Perchloryl fluoride	Formula: ClO_3F	CAS#: 7616-94-6	RTECS#: SD1925000	IDLH: 100 ppm
Conversion: 1 ppm = 4.19 mg/m^3	DOT: 3083 124			

Synonyms/Trade Names: Chlorine fluoride oxide, Chlorine oxyfluoride, Trioxychlorofluoride

Exposure Limits:
NIOSH REL: TWA 3 ppm (14 mg/m^3)
ST 6 ppm (28 mg/m^3)
OSHA PEL†: TWA 3 ppm (13.5 mg/m^3)

Measurement Methods (see Table 1):
None available

Physical Description: Colorless gas with a characteristic, sweet odor.
[**Note:** Shipped as a liquefied compressed gas.]

Chemical & Physical Properties:
MW: 102.5
BP: -52°F
Sol: 0.06%
Fl.P: NA
IP: 13.60 eV
RGasD: 3.64
VP: 10.5 atm
FRZ: -234°F
UEL: NA
LEL: NA
Nonflammable Gas, but will support combustion.

Personal Protection/Sanitation (see Table 2):
Skin: Frostbite
Eyes: Frostbite
Wash skin: N.R.
Remove: N.R.
Change: N.R.
Provide: Frostbite wash

Respirator Recommendations (see Tables 3 and 4):
NIOSH/OSHA
30 ppm: Sa
75 ppm: Sa:Cf*
100 ppm: ScbaF/SaF
§: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: GmFS¿/ScbaE

Incompatibilities and Reactivities: Combustibles, strong bases, amines, finely divided metals, reducing agents, alcohols

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Con (liquid)
SY: Irrit resp sys; liquid: frostbite; in animals: methemo; cyan; lass, dizz, head; pulm edema; pneu; anoxia
TO: Skin, resp sys, blood

First Aid (see Table 6):
Eye: Frostbite
Skin: Frostbite
Breath: Resp support

Potassium hydroxide	Formula: KOH	CAS#: 1310-58-3	RTECS#: TT2100000	IDLH: N.D.
Conversion:	DOT: 1813 154 (dry, solid); 1814 154 (solution)			

Synonyms/Trade Names: Caustic potash, Lye, Potassium hydrate

Exposure Limits:
NIOSH REL: C 2 mg/m^3
OSHA PEL†: none

Physical Description: Odorless, white or slightly yellow lumps, rods, flakes, sticks, or pellets. [**Note:** May be used as an aqueous solution.]

Measurement Methods (see Table 1):
NIOSH 7401

Chemical & Physical Properties:
MW: 56.1
BP: 2415°F
Sol(59°F): 107%
Fl.P: NA
IP: ?
Sp.Gr: 2.04
VP(1317°F): 1 mmHg
MLT: 716°F
UEL: NA
LEL: NA
Noncombustible Solid; however, may react with H_2O & other substances and generate sufficient heat to ignite combustible materials.

Personal Protection/Sanitation (see Table 2):
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contam
Remove: When wet or contam
Change: Daily
Provide: Eyewash
Quick drench

Respirator Recommendations (see Tables 3 and 4):
Not available.

Incompatibilities and Reactivities: Acids, water, metals (when wet), halogenated hydrocarbons, maleic anhydride [**Note:** Heat is generated if KOH comes in contact with H_2O & CO_2 from the air.]

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Ing, Con
SY: Irrit eyes, skin, resp sys; cough, sneez; eye, skin burns; vomit, diarr
TO: Eyes, skin, resp sys

First Aid (see Table 6):
Eye: Irr immed
Skin: Water flush immed
Breath: Resp support
Swallow: Medical attention immed

Uranium (insoluble compounds, as U)	Formula: U (metal)	CAS#: 7440-61-1 (metal)	RTECS#: YR3490000 (metal)	IDLH: Ca [10 mg/m^3 (as U)]
Conversion:	DOT: 2979 162 (metal, pyrophoric)			

Synonyms/Trade Names: **Uranium metal:** Uranium I
Synonyms of other insoluble uranium compounds vary depending upon the specific compound.

Exposure Limits:
NIOSH REL: Ca
TWA 0.2 mg/m^3
ST 0.6 mg/m^3
See Appendix A
OSHA PEL†: TWA 0.25 mg/m^3

Measurement Methods (see Table 1):
None available

Physical Description: Metal: Silver-white, malleable, ductile, lustrous solid. [**Note:** Weakly radioactive.]

Chemical & Physical Properties:
MW: 238.0
BP: 6895°F
Sol: Insoluble
Fl.P: NA
IP: NA
Sp.Gr: 19.05 (metal)
VP: 0 mmHg (approx)
MLT: 2097°F
UEL: NA
LEL: NA
MEC: 60 g/m^3
Metal: Combustible Solid, especially turnings and powder.

Personal Protection/Sanitation (see Table 2):
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contam/Daily
Remove: When wet or contam
Change: Daily
Provide: Eyewash

Respirator Recommendations (see Tables 3 and 4):
NIOSH
¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: 100F/ScbaE

Incompatibilities and Reactivities: Carbon dioxide, carbon tetrachloride, nitric acid, fluorine [**Note:** Complete coverage of uranium metal scrap with oil is essential for prevention of fire.]

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Ing, Con
SY: Derm; kidney damage; blood changes; [carc]; in animals: lung, lymph node damage; [carc] Potential for cancer is a result of alpha-emitting properties & radioactive decay products (e.g., radon).
TO: Skin, kidneys, bone marrow, lymphatic sys [lung cancer]

First Aid (see Table 6):
Eye: Irr immed
Skin: Soap wash prompt
Breath: Resp support
Swallow: Medical attention immed

Uranium (soluble compounds, as U)	Formula:	CAS#:	RTECS#:	IDLH: Ca [10 mg/m^3 (as U)]
Conversion:	DOT:			

Synonyms/Trade Names: Synonyms vary depending upon the specific soluble uranium compound.

Exposure Limits:
NIOSH REL: Ca
TWA 0.05 mg/m^3
See Appendix A
OSHA PEL: TWA 0.05 mg/m^3

Measurement Methods (see Table 1):
None available

Physical Description: Appearance and odor vary depending upon the specific soluble uranium compound.

Chemical & Physical Properties:
Properties vary depending upon the specific soluble uranium compound.

Personal Protection/Sanitation (see Table 2):
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contam/Daily
Remove: When wet or contam
Change: Daily
Provide: Eyewash (UF_6), Quick drench

Respirator Recommendations (see Tables 3 and 4):
NIOSH
¥: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape (Halides): GmFAg100/ScbaE
Escape (Non-halides): 100F/ScbaE

Incompatibilities and Reactivities: **Uranyl nitrate:** combustibles; **Uranium hexafluoride:** water

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Ing, Con
SY: Lac, conj; short breath, cough, chest rales; nau, vomit; skin burns; RBC, casts in urine; prot; high BUN; [carc] Potential for cancer is a result of alpha-emitting properties & radioactive decay products (e.g., radon).
TO: Resp sys, blood, liver, kidneys, lymphatic sys, skin, bone marrow [lung cancer]

First Aid (see Table 6):
Eye: Irr immed
Skin: Water flush immed
Breath: Resp support
Swallow: Medical attention immed

Boron trifluoride	Formula: BF_3	CAS#: 7637-07-2	RTECS#: ED2275000	IDLH: 25 ppm
Conversion: 1 ppm = 2.77 mg/m^3	DOT: 1008 125			

Synonyms/Trade Names: Boron fluoride, Trifluoroborane

Exposure Limits:
NIOSH REL: C 1 ppm (3 mg/m^3)
OSHA PEL: C 1 ppm (3 mg/m^3)

Measurement Methods (see Table 1):
None available

Physical Description: Colorless gas with a pungent, suffocating odor.
[**Note:** Forms dense white fumes in moist air. Shipped as a nonliquefied compressed gas.]

Chemical & Physical Properties:
MW: 67.8
BP: -148°F
Sol: 106% (in cold H_2O)
Fl.P: NA
IP: 15.50 eV
RGasD: 2.38
VP: >50 atm
FRZ: -196°F
UEL: NA
LEL: NA
Nonflammable Gas

Personal Protection/Sanitation (see Table 2):
Skin: N.R.
Eyes: N.R.
Wash skin: N.R.
Remove: N.R.
Change: N.R.

Respirator Recommendations (see Tables 3 and 4):
NIOSH/OSHA
10 ppm: Sa*
25 ppm: Sa:Cf*/ScbaF/SaF
§: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: GmFS/ScbaE

Incompatibilities and Reactivities: Alkali metals, calcium oxide
[**Note:** Hydrolyzes in moist air or hot water to form boric acid, hydrogen fluoride & fluoboric acid.]

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Con
SY: Irrit eyes, skin, nose, resp sys; epis; eye, skin burns; in animals: pneu; kidney damage
TO: Eyes, skin, resp sys, kidneys

First Aid (see Table 6):
Eye: Irr immed
Skin: Water flush immed
Breath: Resp support

Vinyl fluoride	Formula: CH_2=CHF	CAS#: 75-02-5	RTECS#: YZ3510000	IDLH: N.D.
Conversion: 1 ppm = 1.89 mg/m^3	DOT: 1860 116P (inhibited)			

Synonyms/Trade Names: Fluoroethene, Fluoroethylene, Monofluoroethylene, Vinyl fluoride monomer

Exposure Limits:
NIOSH REL: TWA 1 ppm
C 5 ppm [use 1910.1017]
OSHA PEL: none

Measurement Methods (see Table 1):
None available

Physical Description: Colorless gas with a faint, ethereal odor.
[**Note:** Shipped as a liquefied compressed gas.]

Chemical & Physical Properties:
MW: 46.1
BP: -98°F
Sol: Insoluble
Fl.P: NA (Gas)
IP: 10.37 eV
RGasD: 1.60
VP: 25.2 atm
FRZ: -257°F
UEL: 21.7%
LEL: 2.6%
Flammable Gas

Personal Protection/Sanitation (see Table 2):
Skin: Frostbite
Eyes: Frostbite
Wash skin: N.R.
Remove: When wet (flamm)
Change: N.R.
Provide: Frostbite wash

Respirator Recommendations (see Tables 3 and 4):
NIOSH
10 ppm: CcrOv/Sa
25 ppm: Sa:Cf/PaprOv
50 ppm: CcrFOv/GmFOv/PaprTOv/ ScbaF/SaF
200 ppm: SaF:Pd,Pp
§: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: GmFOv/ScbaE

Incompatibilities and Reactivities: None reported [**Note:** Inhibited with 0.2% terpenes to prevent polymerization.]

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Con (liquid)
SY: Head, dizz, conf, inco, narco, nau, vomit; liquid: frostbite
TO: CNS

First Aid (see Table 6):
Eye: Frostbite
Skin: Frostbite
Breath: Resp support

Bromine pentafluoride	Formula: BrF_5	CAS#: 7789-30-2	RTECS#: EF9350000	IDLH: N.D.
Conversion: 1 ppm = 7.15 mg/m^3	DOT: 1745 144			

Synonyms/Trade Names: Bromine fluoride

Exposure Limits:
NIOSH REL: TWA 0.1 ppm (0.7 mg/m^3)
OSHA PEL†: none

Measurement Methods (see Table 1):
None available

Physical Description: Colorless to pale-yellow, fuming liquid with a pungent odor.
[**Note:** A colorless gas above 105°F. Shipped as a compressed gas.]

Chemical & Physical Properties:
MW: 174.9
BP: 105°F
Sol: Reacts violently
Fl.P: NA
IP: ?
Sp.Gr: 2.48
VP: 328 mmHg
FRZ: -77°F
UEL: NA
LEL: NA
Noncombustible Liquid, but a very powerful oxidizer.

Personal Protection/Sanitation (see Table 2):
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contam
Remove: When wet or contam
Change: N.R.
Provide: Eyewash
Quick drench

Respirator Recommendations (see Tables 3 and 4):
Not available.

Incompatibilities and Reactivities: Acids, halogens, arsenic, selenium, sulfur, glass, organic materials, water
[**Note:** Reacts with all elements except inert gases, nitrogen & oxygen.]

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Ing, Con
SY: Irrit eyes, skin, resp sys; corn nec; skin burns; cough, dysp, pulm edema; liver, kidney inj
TO: Eyes, skin, resp sys, liver, kidneys

First Aid (see Table 6):
Eye: Irr immed
Skin: Water flush immed
Breath: Resp support
Swallow: Medical attention immed

Questions?