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)M (NAME & LOCATION) S.D. Eagleton - LLN

(E 12th November 1976

cc A. Munn - Brussels
G.J. Levinskas - St. Louis

T VINYL CHLORIDE

ERENCE

) : R.N. Pittilo - Brussels

C O N F I D E N T I A L

At a recent meeting of BIBRA Panel IV Dr. Lloyd gave some confidential information which should not go outside the company on the progress of the BIBRA VCM feeding trials with rats. The study was at its 97th week and will continue past the 104th week. Deaths started at the 90th week.

Level of VCM in water	Males		Females	
	Died	Tumours	Died	Tumours
250 ppm	17	2	37	4
25 "	9	0	12	0
2.5 "	9	0	11	0
0 "	17	0	16	0

It is concluded that ingestion of VCM produces results similar to inhalation.

I thought you should know of these results and you will understand BIBRA's desire to keep them confidential until the study is complete.

S.D. Eagleton

RSV 0018796

AUTOIGNITION TEMPERATURE AND EXPLOSIVE LIMITS

OF COMMONLY USED CHEMICALS

		EXPLOSIVE LIMITS IN AIR*	°F*
A.	HYDROCARBONS		
	1, 3 Butadiene	2.0-11.5%	804*
	n-hexane	1.2-7.5	500
	Varsol #2	1.1-6.0	450
	Styrene	1.1-6.1	914
	Toluene	1.3-7.0	947
	0-xylene	1.0-6.0	867
B.	HALOGENATED		
	Ethylene dichloride	6.2-15.9	775
	Trichloroethylene	--	770
C.	ALCOHOLS		
	n-butyl alcohol	1.4-11.2	689
	Iso-butyl alcohol	1.7-10.9	800
	Tertbutyl alcohol	2.4-8	892
	Ethyl alcohol	4.3-19	793
	Ethylene glycol	3.2-?	775
	Methanol	7.3-36.5	867
	Phenol	--	1319
	n-propyl alcohol	2.1-13.5	700
	Iso-propyl alcohol	2.0-12.0	750
D.	ETHERS		
	Cellosolve (ethylene gycol monoethyl ether)	2.6-15.7	460
	Butyl cellosolve (ethylene gycol monobutyl ether)	--	472
	Methyl cellosolve (ethylene gycol monomethyl ether)	--	551
	Tetrahydrofuran	2.3-11.8	610
	Vinyl acetate	2.6-13.4	800
	Diethyl ether	1.7-48	360
	Ethylene oxide	3-100	804

*Dangerous Properties of Industrial Materials, 4th Ed., N. Irving Sax, Van Nostrand Reinhold Co., 1975

	EXPLOSIVE LIMITS IN AIR	°F
E. ALDEHYDES AND KETONES		
Acetone	2.6 -12.8	1000
Methyl ethyl ketone (MEK)	1.8-10	960
Cyclohexanone	1.1-?	788
Formaldehyde	7-73	806
F. ACIDS AND DERIVATIVES		
Acetic acid	5.4-16.0	800
Ethyl acetate	2.5-9.0	800
Maleic anhydride	1.4-7.1	890
Stearic acid	--	743
G. OTHER		
Acrylonitrile	3.1-17	898
Triethanolamine	--	707
Carbon disulfide	1.3-44	212

CONTAINER SIZE LIMITS FOR TOXIC VOLATILE MATERIALS IN THE RESEARCH BUILDINGS

VOLATILE LIQUIDS

Hazardous Liquid	TLV*	Allowed Container Size
Acrolein	0.5 ppm	200 ml.
Acrylonitrile and Methacrylonitrile	20	1 gal.
Allyl Alcohol	5	1000 ml.
Carbon Disulfide	20	1000 ml.
Benzene	35	1 gal.
Cellosolves	25	1 gal.
Bromine	1	200 ml.

*Threshold Limit Value.

CONTAINER SIZE LIMITS FOR TOXIC VOLATILE MATERIALS IN THE RESEARCH BUILDINGS — VI - J

CYLINDER GASES

Cylinder Size to be Allowed in Research Building

Gas	Density #/ft.^{3}	TLV*	Allowed Cylinder Size
Ammonia	22	100 ppm	15#
Arsine	4	0.05	Special arrangements case***
Boron Trichloride	3	1	1#
Boron Trifluoride	5	1	1/2#
Butadiene	7	1000	150
Chlorine	5**	2-4	4#
Fluorine		0.1	Special arrangements case***
Hydrogen Bromide	5	3	4#
Hydrogen Chloride	10	5	4#
Hydrogen Fluoride	17	3	1#
Isobutylene	Same as Butadiene		
Methyl Acethylene	Same as Butadiene		
Ozone		0.1	Special arrangements case***
Phosgene	4	0.1	" " "
Phosphine	10	0.3	" " "
Sulfur Dioxide	6	5	5#
Vinyl Chloride	6	500	150

*Threshold Limit Value.

**Based on 20-30 minute exposure effects whereas the remaining values are standard 8 hour exposure values.

***Use in any amount requires consultation with Safety Committee.

PEROXIDE FORMING CHEMICALS — VI-L

Some chemical compounds will react to form peroxides on aging. This can result in a dangerous situation, since peroxides tend to be explosive. Their safe handling requires the following precautions:

1. Purchase materials in small size containers - only the amount that can be used up in a short time.

2. Label each container with a special bright orange label, showing:

    a. Date of receipt.

    b. Date container opened.

    c. Owner's name.

    Labels are available in the Stockroom.

3. Dispose of material within two years of receipt or within one year after opening, whichever comes first.

4. No peroxide former (including vinyl monomers) should ever be distilled to dryness.

5. Upon completion of use, the container of a peroxide forming chemical should be purged with nitrogen (inert gas) prior to storage.

The following listing indicates the commonly used chemicals which readily form peroxides:

Acetal	Bis (4-chlorobutyl) Ether
Allyl Ether	Bis (2-chloroethyl) Ether
Allyl Ethyl Ether	Bis (chloromethyl) Ether (Carcinogen!)
Allyl Phenyl Ether	2-Bromoethyl Ethyl Ether
iso-Amyl Benzyl Ether	t-Butyl Ethyl Ether
n-Amyl Ether	t-Butyl Methyl Ether
p-n-Amyloxybenzoyl Chloride	
Benzyl n-Butyl Ether	n-Butyl Vinyl Ether
Benzyl Ether	Chloracetaldehyde Diethylacetal
Benzyl Ethyl Ether	2-Chlorobutadiene
Benzyl Methyl Ether	Chloromethyl Methyl Ether
Benzyl 1-Naphthyl Ether	Cyclohexene

PEROXIDE FORMING CHEMICALS

Cyclooctene
Decalin
p-Dibenzyloxybenzene
1,2-Dibenzyloxyethane
p-Di-n-Butoxybenzene
1,2-Dichloroethyl Ethyl Ether
Diethoxymethane
2,2-Diethoxypropane
Diethyl Ether
Diethyl Fumarate
Diisopropyl Ether
1,1-Dimethoxyethane
1,2-Dimethoxyethane
Dimethoxymethane
2,2-Dimethoxypropane
Dioxane
1,3-Dioxepane
Di-n-propoxymethane
1,2-Epoxy-3-isopropoxypropane
3-Ethoxypropionitrile
Ethyl Ether
Ethyl Vinyl Ether
n-Hexyl Ether
Isoamyl Ether
Isobutyl Vinyl Ether
Isophorone

beta-Isopropoxypropionitrile
Isopropyl Ether
beta-Methoxypropionitrile
beta-beta-Oxydipropionitrile
n-Propyl Ether
n-Propyl Isopropyl Ether
Tetrahydrofuran
Tetralin
1,3,3-Trimethoxypropene
Vinylidene Chloride
Isoamyl Benzyl Ether
Vinyl Monomers

WASTE CHEMICAL DISPOSAL VII-A

1. Chemical wastes to be disposed under this procedure must be sealed tightly in an appropriate container and labelled. The label should be indelible and bear the name of the disposer, date, chemical name of material to be disposed, and most importantly, the chemical code group of the material. Waste labels are available in stockroom.

2. No material will be accepted for disposal without a chemical code grouping. Consult a knowledgable source of you are not sure of the correct chemical code group of the material you wish to dispose. An incorrectly grouped chemical poses a potentially dangerous situation. The Chemical code groups are as follows;

CHEMICAL GROUPS:

Group A

1) Inorganic acids (Hydrochloric, sulfuric or nitric acids.)
2) Elements and inorganic salts that do not liberate gaseous products when acidified. (eg. sodium chloride, barium silfate-, magnesium nitrate.)
3) Psuedo-Metal compounds (As, Se, etc.), providing they will not liberate gaseous products upon contact with an acid.

Group B

1) Inorganic alkaline chemicals (E.g. sodium hydroxide, ammomium hydroxide).
2) Organic bases (e.g. pyridine, triethanol amine.)
3) Elements and inorganic salts that liberate gaseous products when acidified (e.g. sodium sulfide.)
4) Heavy metals (Hg, Fe, Cu, etc.) compounds.
5) Free and complex cyanides.

Group C

Solid organic compounds, excluding organic acids and bases (e.g. glucose, carbon, resins, etc.). If possible, Group C drums should be separated in halogenated and non-halogenated materials.

Group D

Liquid organic compounds including organic acids but excluding organic bases. (e.g. acetone, xylene, butyric acids.) Note: Peroxide forming materials must be stabilized prior to shipment.

Group E

Inorganic oxiding agents (e.g. bromine, chromerge, potassium & sodium perchlorates, chlorates, chlorites, dichromates, hypochlorites permanganate, persulfates, etc.)

Group F

Solid pesticides, insecticides, fungicides, etc. Note: Each pesticide & insecticide PLC will have to be reviewed on an individual basis.

Group G

Known and suspect carcinogenic materials.

Note: In case of a compound which might fit into two(2) different groups put it into the group based on the part of the molecule of higher toxicity. For example, lead acetate, lead would be Group B, the acetate portion is solid organic, Group C. It would go in Group B.

Group H

Waste oils,including oil from vacuum pumps, oil baths, mineral oils, lubricating oils, etc. all with flash points at or above 100°F.

EXCEPTIONS:

The following exceptions will not be allowed,(cannot be disposed of by this Section VII-A.)

1) Shock sensitive materials (e.g. mercury fulminate, sodium azide, azide, azo-compounds, perchloric acid etc.)

2) materials that are explosion hazards (e.g. dinitrobenzene, dinitrophenol, 4 dinitrophenylhydrazine, hydrazine, etc.)

3) materials that react violently with water producing heat and flame (e.g. sodium metal lithium, potassium, lithium hydride, sodium hydride, phosphorus trichloride, phosphorous pentachloride, phosphorus pentoxide, calcium carbide, etc.)
4) organc oxidizing agents, (e.g. bezoyl peroxide, methyl ethyl ketone peroxide, etc.)
5) pressurized gas containing cylinder (e.g. hydrogen sulfide, etc.)
6) radioactive materials of any type
7) OSHA carcinogens, which include:

a. Acrylonitrile
b. Benzene
c. Alpha-Naphthylamine
d. 4-Nitrobiphenyl
e. 4,4'-Methylenebis (2-Chloroaniline)(Syn.MOCA)
f. Methyl Chloromethyl Ether
g. 3,3'-Dichlorobenzidine (and its salts)
h. Bis-Chloromethyl Ether
i. Beta-Naphthylamine
j. Benzidine
k. 4-Aminodiphenyl
l. Ethleneimine
m. Beta-Propiolactone
n. 2-Acetylaminoflourene
o. N-Nitrosidimethylamine
p. Vinyl Chloride
q. Coke Oven Emissions
r. Di-Bromochloropropane

3. After the waste chemical is all prepared for disposal, bring it to the Research stockroom.The Research stockroom clerk has access to the waste chemical drums,each of which is assigned to a specific chemical code group. The container of waste chemical is placed intact into the appropriate drum, according to group. The drums are packed with vermiculite.

4. The research stockroom clerk keeps a record of the contents of each chemical group waste drum in order to be able to provide a packing listfor the contract disposal firm at pick-up time. He has the responsibility of seeing that all chemical wastes are disposed in conformance with this procedure in the appropriate group drum. However, the Research stockroom clerk is not responsible for classifying a waste chemical into its chemical code group; this is the responsibility of the disposer. No chemical waste should

be disposed under this procedure without the knowledge of the Research stockroom clerk.

5. Five Gallon Pails or Drums

1. Non-toxic materials
   a. Crimp the top of the pail, or secure the drum bungs tightly.

   b. Place the pail or drum in the Ahern Open Box Dumpster.

2. Toxic Materials

   a. Label the pail or drum with the chemical name date, amount of contents, name of disposer, and chemical code grouping.

   b. Close container tightly so that contents will not leak out.

   c. Bring container to the stockroom for handling, the same as in 3 above.

6. General Requirements

   a. Under no circumstances will any material be added to a partly-full container in the disposal area.

   b. All five gallon pails used for disposal must be equipped with lid having a plastic insert which will blow out to relieve pressure. (Available in stores).

   c. All materials hauled out in the Dumpsters are disposed of by land fill. It is esential that toxic obnoxious chemicals are not disposed in this manner.

   d. Labeling and record keeping are essential requirements for proper application of this procedure.

   e. For disposal of peroxides consult Section VII-B and contact a member of Hazardous chemical Advisory Board.

   f. For disposal of materials listed under EXEMPTIONS contact member of Hazardous Chemical Advisory Board.