



"Contains NO CBI"

8EHQ-0892-12856

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UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC.
HEALTH, SAFETY AND ENVIRONMENTAL AFFAIRS

August 21, 1992

DUPLICATE

①

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

8E CAP

Document Processing Center (TS-790)
Room L-100
Office of Toxic Substances
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

92 AUG 27 PM 1:55

Attn: Section 8(e) Coordinator (CAP Agreement)

Re: CAP Agreement Identification No. 8ECAP-0110

Dear Sir or Madam:

Union Carbide Corporation ("Union Carbide") herewith submits the following report pursuant to the terms of the TSCA §8(e) Compliance Audit Program and Union Carbide's CAP Agreement dated August 14, 1991 (8ECAP-0110). This report describes acute toxicity studies with methyl isopropenyl ketone (CASRN 814-78-8).

"Range Finding Tests on Methyl Isopropenyl Ketone", Mellon Institute of Industrial Research (University of Pittsburgh), Report 13-68, August 14, 1950.

A complete summary of this report is attached.

Previous TSCA Section 8(e) or "FYI" Submission(s) related to this substance are:

(None)

Previous PMN submissions related to this substance are: (None)

3/24/95

This information is submitted in light of EPA's current guidance. Union Carbide does not necessarily agree that this information reasonably supports the conclusion that the subject chemical presents a substantial risk of injury to health or the environment.

In the attached report the term "CONFIDENTIAL" may appear. This precautionary statement was for internal use at the time of issuance of the report. Confidentiality is hereby waived for purposes of the needs of the Agency in assessing health and safety information. The Agency is advised, however, that the publication rights to the contained information are the property of Union Carbide.

Yours truly,



William C. Kuryla, Ph.D.
Associate Director
Product Safety
(203/794-5230)

WCK/cr
Attachment (3 copies of cover letter, summary, and report)

SUMMARY

②

Confidential

Report 13-68

⊕

R: 8-14-50

LHb 8/15/50

MELLON INSTITUTE OF INDUSTRIAL RESEARCH

UNIVERSITY OF PITTSBURGH

SPECIAL REPORT

on

Range Finding Tests on Methyl Isopropenyl Ketone

AFDK

Carbide and Carbon Chem. Div., U.C.C., Industrial Fellowship No. 274-13

Summary

Methyl isopropenyl ketone is a highly toxic compound as indicated by an R.F. LD₅₀ of 0.178 gm./kg. for rats fed a 1% dispersion by stomach tube. It is twice as toxic as ethylidene acetone and about 12 times as toxic as mesityl oxide by this route.

That it penetrates skin readily is demonstrated by a R.F. LD₅₀ of 0.23 (0.07 to 0.77) ml./kg. for rabbits subjected to a covered application for 24 hours. It is over twice as toxic as ethylidene acetone by this route also.

The inhalation of air saturated with the vapor at room temperature is a serious hazard. Only 1 of 6 rats survived a 2 minute exposure to such conditions. Rats tolerated 62.5 ppm. for 4 hours but 5 of 6 were killed by 125 ppm. Guinea pigs survived 125 ppm. but 2 of 3 died after a 4-hour exposure to 250 ppm.

The apparent toxicity by skin penetration, and inhalation as well, relegates methyl isopropenyl ketone to the Class B poison category of the I.C.C. classification.

This ketone causes only mild irritation to the rabbit skin when applied uncovered, producing reactions similar to benzene. Small amounts of the undiluted compound and 1% dilutions in propylene glycol, both, cause severe corneal necrosis of the rabbit eye, comparable to that produced by the worst eye offenders.

Confidential

(4)

R: 8-14-50
LH 8/15/50

Report 13-68

MELLON INSTITUTE OF INDUSTRIAL RESEARCH

UNIVERSITY OF PITTSBURGH

SPECIAL REPORT

on

AFDR

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Carbide and Carbon Chem. Div., U.C.C., Industrial Fellowship No. 274-13

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The inhalation of air saturated with the vapor at room temperature is a serious hazard. Only 1 of 6 rats survived a 2 minute exposure to such conditions. Rats tolerated 62.5 ppm. for 4 hours but 5 of 6 were killed by 125 ppm. Guinea pigs survived 125 ppm. but 2 of 3 died after a 4-hour exposure to 250 ppm.

The apparent toxicity by skin penetration, and inhalation as well, relegates methyl isopropenyl ketone to the Class B poison category of the I.C.C. classification.

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Sample

Eight ounces of methyl isopropenyl ketone inhibited with 0.1% hydroquinone were received on 7-10-50 from S. Charleston identified by numbers 215-RD-97 and 92 DI-47. The sample was submitted by Mr. W. H. Stoops for toxicity evaluation. On July 13, 1950, Mr. Cassis of S. Charleston was notified that this compound was a Class B. poison according to I.C.C. definition.

Single Oral Doses

The R.F. LD₅₀ for male albino Sherman strain non-fasted rats weighing 90 to 120 grams is 0.178 gm./kg. when methyl isopropenyl ketone is fed as a 1.0% dispersion in 1% "Tergitol" 7 by stomach tube. No range is calculable because at no one dosage level was there both death and survival during the 14-day observation period. Deaths occurred within 24 hours after the dose was administered and no remarkable abnormalities of the viscera were seen at autopsy.

During the course of this range finding study 1.0 gm./kg. of a 10% dispersion was fed to five rats. This more concentrated dispersion and higher dosage level caused death within one hour. Autopsy revealed hemorrhage of the gastrointestinal tract. The rats were violently active following the stomach tubing and exhibited nasal and ocular irritation.

When fed undiluted, a dosage of 0.05 gm./kg. killed 5 of 10 rats within 48 hours and 7 of the 10 within 8 days. The dangers of oral ingestion are obvious from the above. For comparison the LD₅₀ for mesityl oxide is 2.2 and for ethylidene acetone 0.32 gm./kg. respectively.

Skin Penetration

The 24-hour application of undiluted methyl isopropenyl ketone to the clipped trunk of male albino New Zealand strain rabbits under "Vinylite" sheeting resulted in a R.F. LD₅₀ of 0.23 (0.07 to 0.77) ml./kg. based upon a 14-day observation period. This covered application caused severe erythema, necrosis and desquamation of the skin. Autopsy of victims revealed congested lungs, pale or mottled livers, pale and swollen kidneys and some congestion of the stomach and intestinal vessels. By way of comparison the R.F. LD₅₀ for ethylidene acetone is 0.5 ml./kg.

Inhalation

Substantially saturated vapor produced at room temperature was lethal to 6 of 6 rats in a 5-minute exposure and to 5 of 6 in 2 minutes. Vapors evolved at room temperature are a serious hazard and inhalation must be avoided.

Rats and guinea pigs were exposed for 4-hour periods to measured concentrations with results as follows:

Mortality Ratio

<u>ppm.</u>	<u>Rats</u>	<u>Guinea Pigs</u>
62.5	0/6	-
125.	5/6	0/3
250	-	2/3
500	6/6	3/3

A concentration of 582 ppm. (2 mgm./liter) killed 10 of 10 rats exposed for 1 hour and 16 minutes. This response places methyl isopropenyl ketone in the Class B. poison category for purposes of I.C.C. classification.

Irritation

The application of 0.01 ml. amounts of the undiluted ketone to the clipped skin of the rabbit belly in the vesicant test resulted in moderate to marked capillary injection. This uncovered application was much less damaging to skin than the covered skin penetration test. Irritation is comparable to that produced by benzene, a member of Grade 3 in the 10 grade rating system.

The undiluted fluid causes severe damage to the cornea of the rabbit eye as do also 5 and 1% dilutions in propylene glycol. These reactions place methyl isopropenyl ketone in Grade 10 of the eye burn rating system or among the worst eye offenders.

Charles P. Carpenter
SENIOR INDUSTRIAL FELLOW

Charles P. Carpenter

Typed: August 15, 1950 - mek

Triage of 8(e) Submissions

Date sent to triage: 2/5/96

NON-CAP

CAP

Submission number: 12856A

TSCA Inventory:

Y

N

D

Study type (circle appropriate):

Group 1 - Dick Clements (1 copy total)

ECO

AQUATO

Group 2 - Ernie Falke (1 copy total)

ATOX

SBTOX

SEN

w/NEUR

Group 3 - Elizabeth Margosches (1 copy each)

STOX

CTOX

EPI

RTOX

GTOX

STOX/ONCO

CTOX/ONCO

IMMUNO

CYTO

NEUR

Other (FATE, EXPO, MET, etc.): _____

Notes:

THIS IS THE ORIGINAL 8(e) SUBMISSION; PLEASE REFILE AFTER TRIAGE DATABASE ENTRY

For Contractor Use Only	
entire document: <u>0</u> 1 2 pages <u>42</u>	pages <u>1, 2, 3</u>
Notes:	
Contractor reviewer: <u>LPS</u>	Date: <u>5/11/95</u>



CECATS/TRIAGE TRACKING DBASE ENTRY FORM

ECATS DATA:
Submission # 8EHQ-0892-12856 SEQ. A

TYPE INT. SUPP FLWP

SUBMITTER NAME: Union Carbide Chemicals
and Plastics Company Inc.

INFORMATION REQUESTED: FLWP DATE:
0501 NO INFO REQUESTED
0502 INFO REQUESTED (TECH)
0503 INFO REQUESTED (VOL ACTIONS)
0504 INFO REQUESTED (REPORTING RATIONALE)
DISPOSITION:
 0639 REFER TO CHEMICAL SCREENING
 0678 CAP NOTICE

VOLUNTARY ACTIONS:
0401 NO ACTION REPORTED
0402 STUDIES PLANNED/IN PROGRESS
0403 NOTIFICATION OF WORKERS/OTHERS
0404 LABEL/MSDS CHANGES
0405 PROCESS/HANDLING CHANGES
0406 APP/USE DISCONTINUED
0407 PRODUCTION DISCONTINUED
0408 CONFIDENTIAL

SUB. DATE: 08/21/92 OTS DATE: 08/27/92 CSRAD DATE: 03/24/95

CHEMICAL NAME: _____ CAS# 814-78-8

INFORMATION TYPE:	P F C	INFORMATION TYPE:	P F C	INFORMATION TYPE:	P F C
0201 ONCO (HUMAN)	01 02 04	0216 EPI/CLIN	01 02 04	0241 IMMUNO (ANIMAL)	01 02 04
0202 ONCO (ANIMAL)	01 02 04	0217 HUMAN EXPOS (PROD CONTAM)	01 02 04	0242 IMMUNO (HUMAN)	01 02 04
0203 CELL TRANS (IN VITRO)	01 02 04	0218 HUMAN EXPOS (ACCIDENTAL)	01 02 04	0243 CHEM/PHYS PROP	01 02 04
0204 MUTA (IN VITRO)	01 02 04	0219 HUMAN EXPOS (MONITORING)	01 02 04	0244 CLASTO (IN VITRO)	01 02 04
0205 MUTA (IN VIVO)	01 02 04	0220 ECO/AQUA TOX	01 02 04	0245 CLASTO (ANIMAL)	01 02 04
0206 REPRO/TERATO (HUMAN)	01 02 04	0221 ENV. CONC/REL/FATE	01 02 04	0246 CLASTO (HUMAN)	01 02 04
0207 REPRO/TERATO (ANIMAL)	01 02 04	0222 EMER INCI OF ENV CONTAM	01 02 04	0247 DNA DAM/REPAIR	01 02 04
0208 NEURO (HUMAN)	01 02 04	0223 RESPONSE REQEST DELAY	01 02 04	0248 PROD/USE/PROC	01 02 04
0209 NEURO (ANIMAL)	01 02 04	0224 PROD/COMP/CHEM ID	01 02 04	0251 MSDS	01 02 04
0210 ACUTE TOX. (HUMAN)	01 02 04	0225 REPORTING RATIONALE	01 02 04	0299 OTHER	01 02 04
0211 CHR. TOX. (HUMAN)	01 02 04	0226 CONFIDENTIAL	01 02 04		
<input checked="" type="checkbox"/> 0212 ACUTE TOX. (ANIMAL)	<input checked="" type="checkbox"/> 01 02 04	0227 ALLERG (HUMAN)	01 02 04		
0213 SUB ACUTE TOX (ANIMAL)	01 02 04	0228 ALLERG (ANIMAL)	01 02 04		
0214 SUB CHRONIC TOX (ANIMAL)	01 02 04	0239 METAB/PHARMACO (ANIMAL)	01 02 04		
0215 CHRONIC TOX (ANIMAL)	01 02 04	0240 METAB/PHARMACO (HUMAN)	01 02 04		

TRIAQE DATA: NON-CBI INVENTORY YES ONGOING REVIEW YES (DROP/REFER)
CAS SR NO NO (CONTINUE)
IN PAKING REFER

SPECIES: RAT
RBT
GP

TOXICOLOGICAL CONCERN: LOW
MED ATOX Coral, dermal, inhal., irr.-dermal)
HIGH ATOX Inhalation, irr.-eye)

USE: _____ PRODUCTION: _____

COMMENTS

12856A

M

Acute oral toxicity in rats is of moderate concern based on the results of three studies. In the first study, the LD₅₀ was 178 mg/kg (1% dispersion in 1% Tergitol 7) in rats. There were no gross pathological alterations. In the second study, a single oral dose of 1,000 mg/kg (10% dispersion) was lethal to five rats. The rats exhibited nasal and ocular irritation. Necropsy revealed hemorrhage of the GI tract. In the third study, an oral dose of 50 mg/kg (undiluted) was lethal to 7/10 rats.

M

Acute dermal toxicity in rabbits is of moderate concern. Single dermal doses to male New Zealand White rabbits yielded an LD₅₀ of 230 mg/kg (converted from mL/kg assuming a density of 1). The animals exhibited severe erythema, necrosis, and desquamation of the skin. Necropsy revealed congested lungs, pale or mottled livers, pale and swollen kidneys, and congestion of the GI tract.

H

Acute inhalation toxicity in rats is of high concern based on the results of three studies. In the first study, a substantially saturated vapor was lethal to 6/6 rats in five minutes and 5/6 rats in two minutes. In the second study, single 4-hour inhalation exposures to rats (6/group) at levels of 62.5, 125, and 500 ppm were lethal (0/6, 5/6, and 6/6, respectively). In the third study, a concentration of 582 ppm was lethal to 10/10 rats exposed for 1 hour and 16 minutes.

M

Acute inhalation toxicity in guinea pigs is of moderate concern. Single 4-hour inhalation exposures to guinea pigs (3/group) at levels of 125, 250, and 500 ppm were lethal (0/3, 2/3, and 3/3, respectively).

M

Dermal irritation in rabbits is of moderate concern. Application of 0.01 mL to the clipped skin of rabbits resulted in moderate to marked capillary injection. Irritation was less severe when the application site was uncovered.

H

Eye irritation in rabbits is of high concern. Instillation of the material (undiluted or as 1% and 5% dilutions in propylene glycol) into rabbit eyes resulted in severe corneal damage.