



**CONTAINS NO CBI**

**UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC.**

HEALTH, SAFETY AND ENVIRONMENTAL AFFAIRS

October 31, 1991

*Spp*

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*8EHO-1191-1437 Init.*

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U.S. Environmental Protection Agency  
401 M Street, SW  
Washington, DC 20460



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**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 a range finding (acute) toxicity study with tert-butyl CELLOSOLVE® (t-butoxyethanol).

"tert.-Butyl CELLOSOLVE (92%): Range Finding Toxicity Studies",  
Chemical Hygiene Fellowship (Carnegie-Mellon University), Project  
Report 40-24, March 4, 1977.

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)

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.

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In the attached report the term "BUSINESS CONFIDENTIAL" is entered on the first page. 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.  
Assistant Director  
Product Safety  
(203/794-5230)

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

CONTAINS NO OEBD-24

REF.-Butyl CELLOSOLVE (92X)

Range Finding Toxicity Studies

Sponsor: *Union Carbide Corporation*

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Summary

- Stomach Intubation, rat - LD50 = 4.92 ml/kg; dosed as received.
- Skin Penetration, rabbit - LD50 = 1.13 ml/kg; dosed as received.
- Inhalation, rat -  
Substantially saturated vapor, static conditions at 22°C.  
8 hours killed 0 of 6 (anesthesia, bloody urine).
- Uncovered Skin Irritation, rabbit - None, Grade 1.
- Eye Injury, rabbit - Moderate, Grade 7.

**CONFIDENTIAL:** Not to be released  
outside UCC without the written  
consent of the C&P Medical Director,  
Occupational Health Team Operations  
Manager, or Product Safety Director.

Project Report 40-24  
5 Pages  
March 4, 1977  
Tel: (412) 327-1020

CONTAINS NO  
C&P

CHEMICAL HYGIENE FELLOWSHIP  
Carnegie-Mellon Institute of Research  
Carnegie-Mellon University  
4400 Fifth Avenue  
Pittsburgh, Pa. 15213

tert.-Butyl CELLOSOLVE (92%)

Range Finding Toxicity Studies

Sponsor: *Union Carbide Corporation*

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Summary

Stomach Intubation, rat - LD50 = 4.92 ml/kg; dosed as received.  
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Inhalation, rat -  
Substantially saturated vapor, static conditions at 22°C.  
8 hours killed 0 of 6 (anesthesia, bloody urine).  
Uncovered Skin Irritation, rabbit - None, Grade 1.  
Eye Injury, rabbit - Moderate, Grade 7.

Interpretation

tert.-Butyl CELLOSOLVE was moderately toxic following single stomach intubation and covered dermal application routes of administration. Application of the material to rabbit skin resulted in no irritation; however, moderate corneal injury, with iritis, resulted from instillation of the material into rabbit eyes. Inhalation of substantially saturated vapor under normal handling conditions should be avoided as it may result in loss of coordination and anesthesia. Bloody urine was observed among animals on each of the toxicity assays indicating possible kidney or blood effects. This finding is consistent with results on toxicity tests performed previously with similar materials.

Compared to butyl CELLOSOLVE (tested previously), tert.-butyl CELLOSOLVE was about one third as toxic perorally (diluted in water) and about one half as toxic dermally. It was also somewhat less toxic following inhalation of substantially saturated vapor. The tert.-butyl CELLOSOLVE was not irritating to rabbit skin whereas the butyl CELLOSOLVE was slightly irritating. The trend was reversed in the eye injury test as the tert.-butyl CELLOSOLVE was considerably more irritating.

Sample

Quantity: 6 ounces

Date Received: 12-1-76

CNF Sample No.: 39-489

Submitted By: E. K. Harris

Division: Chemicals and Plastics  
South Charleston, WV

Identification: 8-EKH-42 (out 3)

Peroral, Single Dose to Rats

LD50 - 4.92 (3.58 to 6.78) ml/kg; dosed as received.

Conditions - Standard.

Dosage; ml/kg	Dead Dosed	Days to Death	Weight Change	Signs and/or Symptoms
8.0	5/5	1,1,1,1,1	-	Sluggish, unsteady gait 10 min.
4.0	1/5	1	108 to 128 gm	Sluggish, unsteady gait 5 min; bloody urine, eyes pale 1 day.
2.0	0/5	-	106 to 136 gm	-

Gross Pathology - In victims, slight petechial hemorrhages of the lungs; livers pale and mottled; spleens and kidneys dark and mottled; kidney sections slightly congested; stomachs distended, liquid or gas-filled and yellow; intestines liquid-filled, yellow and pink; bladders blood-filled. In survivors, nothing remarkable.

Conclusions - Moderately toxic following acute peroral intubation.

Skin Penetration, Single Dose to Rabbits

LD50 - 1.13 (0.519 to 2.47) ml/kg; dosed as received.

Conditions - Standard. Sample used was the aerated material remaining from the inhalation exposure, except for 2 rabbits dosed with fresh material at the lowest level (one died).

Dosage; ml/kg	Dead Dosed	Days to Death	Weight Change	Skin Irritation	Signs and/or Symptoms
3.2	2/2	2,3	-	erythema	-
1.6	3/4	2,2,4	95 gm	erythema	One with bloody urine at 24 hr.
0.8	1/4	2	172, 222 gm	-	-

Gross Pathology - In victims, lungs congested; livers congested and mottled; stomach linings orange in color; kidneys dark; bloody urine. Nothing remarkable in survivors.

Conclusions - Moderately toxic following acute covered dermal application.

Inhalation, Single, by Rats

Conditions - Static exposure at 22°C. Procedure B of standard test procedures.

Procedure	Time	Concentration	Dead Dosed	Death	Weight Change	Signs and/or Symptoms
B	8 hr	Substantially saturated vapor	0/6	-	64 to 99 gm	Slight loss of coordination, blood in urine within 4 hr; severe loss of coordination within 5 hr; anesthesia within 7 hr.

Gross Pathology - Small amount of blood in stomach of 2 rats.

Conclusions - The inhalation of substantially saturated vapor evolved at room temperature under normal handling conditions should be avoided as it may result in severe loss of coordination, anesthesia and possible kidney or blood effects as evidenced by the blood in the urine.

Skin Irritation, Rabbit, Uncovered

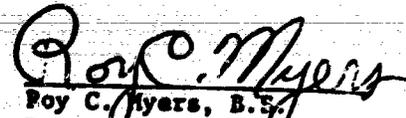
Conditions - Standard. Applied undiluted.

Conclusions - No irritation on 5 rabbits. Grade 1.

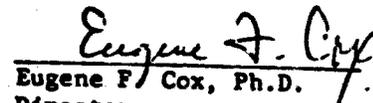
Eye Irritation, Rabbit

Conditions - Standard. Instilled undiluted or in distilled water.

Conclusions - Moderate to severe corneal injury, with iritis, from 0.02 ml undiluted per eye, from 0.005 ml undiluted per eye and from 0.5 ml per eye of a 40% dilution in distilled water; no injury to minor injury, with iritis one of 5 eyes, from 15% in distilled water. Grade 7.

  
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Advisory Fellow

  
Eugene F. Cox, Ph.D.  
Director

Approved:

Acknowledgments:

Single Peroral Tests

Skin Penetration, Irritation Studies

Inhalation Studies

Linda J. Calisti, B.S.  
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Fellow

Daniel L. Geary, Jr., M.S.  
Junior Fellow

Date: March 11, 1977

Typed: dom

Standard Test Procedures

In all tests, the nonfasted animals are maintained on appropriate Wayne diets and water *ad lib* except during period of manipulation or confinement. Dosage levels differ by a factor of 2 in a geometric series. LD50s or LC50s are calculated by the moving average method based on a 14-day observation period.

Toxicity Terminology for Peroral and 24-Hr Dermal LD50s (A)/Inhalation 4-Hr LC50 (B)

	<u>A, gm/kg</u>	<u>B, ppm</u>		<u>A, gm/kg</u>	<u>B, ppm</u>
Extremely low order	> 15	> 100M	Highly	0.05-0.5	100-1M
Slightly	5-15	10M-100M	Seriously	0.01-0.05	10-100
Moderately	0.5-5	1M-10M	Dangerously	< 0.001	< 10

Peroral. Compounds administered by stomach intubation to Wistar derived male rats, 90-120 grams in weight and 3 to 4 weeks of age, reared in our own colony.

Skin Penetration. Male albino rabbits, 3 to 5 months of age, are immobilized during the 24-hour contact period with the compound retained under impervious sheeting on the clipped intact skin of the trunk. Thereafter, excess fluid is removed to prevent ingestion. Maximum dosage that can be retained is 16 to 20 ml/kg.

Inhalation. Procedure A. Concentrated vapor is generated in a gas washing bottle by passing dried air at 2.5 liters/min through a fritted glass disc immersed to a depth of at least 1-1/2 inches in the chemical which is delivered to rats in a 9-liter glass exposure chamber. Mean vapor concentration is calculated from the loss in weight of the liquid or estimated from the vapor pressure at the actual temperature of the chemical during aeration.

Procedure B. Substantially saturated vapor is prepared by spreading 50 grams of chemical over 200 cm<sup>2</sup> area on shallow tray placed near the top of a 120-liter glass chamber which is then sealed for at least 16 hours while an intermittently operated fan agitates the internal chamber atmosphere. Rats are then introduced in a gasketed drawer-type cage designed and operated to minimize vapor loss.

Procedure C. Mist, vapor and any oxidation or decomposition products of the chemical held at 170°C are generated and delivered as in A.

Procedure D. Vapor at metered concentration, not checked analytically, is generated by feeding the liquid at a constant rate down the inside of a spirally corrugated surface of a minimally heated one-inch Pyrex tube, through which metered air is passed. Resultant vapor is delivered as in A.

Procedure E. Spray - Solutions or suspensions are atomized in a glass VAPONEFRIN nebulizer using dried compressed air at 9 liters/min (corrected) and 22 psi. The resultant aerosol of droplets averaging 2 microns in diameter is conducted directly into a 60-liter cubic glass chamber containing rats. Mean aerosol concentration is calculated from the amount of material atomized.

Procedure F. Dust - Dust clouds are generated by a baffled Wright Dust Feed through which air is passed at 14 liters/min (uncorrected) at 5 psi. The dust is delivered directly to a 120-liter plexiglas chamber containing rats. Airborne dust concentrations are measured gravimetrically every half hour.

Skin Irritation. Chemical is applied in 0.01 ml amounts to clipped, uncovered intact skin of 5 rabbit bellies either undiluted or in progressive dilutions of 10, 1, 0.1, and 0.01% in solvent. Ten grades are recognized based on appearance of moderate or marked capillary injection, erythema, edema or necrosis within 24 hours. No injury from undiluted = Grade 1.

Eye Irritation. Eyes not staining with 5% fluorescein in 20 seconds contact are accepted. Single instillation of 0.005, 0.02, 0.10 or 0.5 ml undiluted or of 0.5 ml of 40, 15, 5 and 1% dilutions are made into conjunctival sac of 5 rabbits. Read immediately unstained and after fluorescein at 24 hours, with ten grades recognized. Trace or no injury from 0.5 ml undiluted = Grade 1.

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ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED

DATE 11-05-91 BY 1042/ML