

OFFICE OF TOXIC SUBSTANCES
CODING FORM FOR GLOBAL INDEXING

REV. 7/27/82

Microfiche No. (7) •	OTS 0206671		1	No. of Pages	2
Doc I.D.	878214852	3	Old Doc I.D.	8DS	4
Case No.(s)	OTS 84PP3A				5
Date Produced (6)	6	Date Rec'd (6)	7	Conf. Code •	8
021257		062984		N	
Check One:	<input type="checkbox"/> Publication		<input type="checkbox"/> Internally Generated		<input checked="" type="checkbox"/> Externally Generated
Pub/Journal Name					9
					9
Author(s)					10
Organ. Name	DOW CHEM CO				11
Dept/Div					12
P.O. Box	13	Street No./Name	1803 BLDG		14
City	MIDLAND	15	State	MI	16
			Zip	48649	17
			Country		18
MID No. (7)		19	D & B NO. (11)		20
Contractor					21
Doc Type	RI UP HEAD 8D SU HS FN				22
Doc Title	RESULTS OF RANGE FINDING TOXICOLOGICAL TESTS ON ALLYL GLYCIDYL ETHER				23
Chemical Name (300 per name)	25		CAS No. (10)	24	
GLYCIDOL & ITS DERIVATIVES			999800-13-4		
ALLYL GLYCIDYL ETHER			106-92-3		

5-15-83
LK

IA

D-000259

878214852

Biochemical Research Department

The Dow Chemical Company

RESULTS OF RANGE FINDING TOXICOLOGICAL
TESTS ON ALLYL GLYCIDYL ETHER

File
K No.
Chg.
Rept. By K. J. Olson

Signed K. J. Olson Checked DDM^e Collister
Date Feb. 8, 1957 Date Feb. 12, 1957

PROBLEM

The subject material has a possible use as a diluent in the preparation of epoxy resins. It is desired that the toxicity of this material be compared with that of butyl glycidyl ether, styrene oxide, phenyl glycidyl ether, and "3-2x". In addition to this information, are there any particular problems or hazards associated with the industrial use or handling of the subject material?

CONCLUSIONS

The relative toxicity of these materials has been discussed in a letter by _____ to _____ written October 26, 1956. This letter indicates that on the basis of comparative preliminary toxicity "3-2x" should be the diluent of choice, while butyl glycidyl ether and allyl glycidyl ether, being very similar in degree and type of toxicity, would be the next materials of choice. Phenyl glycidyl ether and styrene oxide would be the last choices.

The subject material has a moderate acute oral toxicity.

(Continued)

000002

DEGREES OF EXPOSURE RELATED TO TYPES OF OPERATION		PRECAUTIONS (SEE CODE BELOW)								
		EYES	SKIN	INHALATION*		INGESTION				
				DUST OR MIST	VAPOR					
I	NO CONTACT	Characterized by remote operation with equipment isolated from the work area. The persons entering isolated areas will require the personal protection outlined for IV below.				A	A		A	A
II	MINOR CONTACT	Characterized by closed systems with equipment vented outside the work area; instrument control; mechanical handling of materials in bulk. Examples are: continuous reactors; stills and filters; enclosed conveyors; ventilated packaging.				B	B		A	A
III	OCCASIONAL DAILY CONTACTS	Characterized by manual handling of materials in packages such as bags, drums and fiberpaks. Ventilation may be provided for specific jobs. Many batch operations fall into this category.				D	D		C	A
IV	GROSS CONTACT LIKELY	Characterized by hand operation. Examples are: Emergency repairs, cleaning equipment, cleaning filters, taking care of spills, packaging volatile or dusty materials without ventilation, wheeling and tray drying.				D	D		D	A

EYE CONTACT	A No eye protection needed.	D Use chemical workers goggles.
	B Use safety glasses without side shields.	E Use gas tight goggles or a full face gas mask.
SKIN** CONTACT	C Use safety glasses with side shields.	
	A A bath and clean clothes once per week along with the usual washing at mealtimes should be adequate precautions.	D Clothing should be changed and skin washed promptly upon any detectable contact. Each use will require special consideration to determine suitable protective devices and standards of personal cleanliness.
INHALATION	B Require shower at the end of the work period and clean clothing from the skin out at the start of each work day.	E Impervious clothing such as rubber boots, rubber aprons, and rubber gloves will be required. Specific items will be dictated as required by circumstance.
	DUST OR MIST	A No respiratory protection.
VAPOR	B No protection required for exposure of thirty min. duration or less to obviously dusty atmospheres. Exposures of longer duration will require the use of a dust respirator bearing the approval of the U. S. Bureau of Mines for the use with toxic dusts.	E Any exposure to dusty atmospheres will require the use of an airline respirator, blower mask, or Chemox mask.
	A No precautions necessary.	C Longer exposures either single or repeated, will require canister gas mask or respirator. (Saturated atmosphere calculated to be less than 20,000 ppm, or 2%.)
INGESTION	B No precautions necessary for single exposures of less than 1/2 hour. Longer single exposures, or frequently repeated exposures will require a canister gas mask or respirator.	D Gas mask with canister required at all times. (Saturated atmosphere calculated to be less than 20,000 ppm or 2%.)
	A No unusual procedures required.	E Evacuate area at once and enter only with airline respirator, blower mask or Chemox mask. (Saturated atmosphere is above 20,000 ppm, or 2%)
INGESTION	A No unusual procedures required.	E Food and tobacco should not be present in the work area. Hands and face should be washed before smoking and eating.

COMMENTS

**GOOD PRACTICE REQUIRES THAT GROSS AMOUNTS OF ANY CHEMICAL BE REMOVED FROM THE SKIN AS SOON AS IS PRACTICAL

*SUITABLE GAS MASK CANISTER

Organic vapor

SIGNED K. J. Olson D. D. McCollister CHECKED H. R. Hoyle
DATE 1-3-57 1-3-57 DATE 1-11-57

CONCLUSIONS (CONTINUED)

There is no problem from ingestion incidental to industrial handling and use of the substance.

The 100% material has a serious effect upon the eye. Direct contact with it is likely to result in tissue destruction leading to permanent impairment of vision. Special and particular precautions must be taken to prevent contact with the eyes. The 10% solution in propylene glycol has only a slight effect upon the eye. Safety glasses should provide satisfactory protection in the routine handling of dilute solutions of the material.

The 100% material has a slight effect on intact skin and a moderate to severe effect on abraded skin. The 10% solution in Dowanol 50B has a slight effect on intact skin and a serious effect on abraded skin. It is also important to emphasize that a single exposure to relatively low concentrations may result in absorption by the skin of lethal amounts of the material. Precautions must be taken to avoid skin contact. Protective clothing impermeable to the material should be worn as required by circumstances and good care and cleanliness should be exercised at all times.

The subject material may present a definite problem from a single exposure to the vapor or fumes even at room temperature. The vapors and concentrations sufficient to cause systemic injury probably are irritating and painful to the eye and nose. Exposure to the vapor of this material must be avoided.

(Continued)

000004

CONCLUSIONS (CONTINUED)

These conclusions are based upon range finding toxicological tests and are limited to precautions for industrial handling of the material. Development of specific uses will require consideration of the health problems presented and of the need for further toxicological studies.

HAZARDS, PRECAUTIONS FOR SAFE HANDLING,
AND FIRST AID MEASURES

Ingestion

The subject material has a moderate acute oral toxicity. There is no problem from ingestion incidental to the handling and industrial use of this substance. It should be emphasized, however, that serious injury may result from swallowing large amounts of the material. Containers should be labeled so that accidental swallowing due to mistaken identity cannot occur. If appreciable amounts are swallowed, vomiting should be induced by tickling the back of the tongue with the fingers or by giving an emetic such as two tablespoonfuls of table salt in a glass of warm water. Medical attention should then be obtained.

Eye Contact

The 100% material has a serious effect upon the eye. Direct contact with it is likely to result in tissue destruction leading to permanent impairment of vision. Special and particular precautions must be taken to prevent contact with the eyes. Tight fitting goggles such as chemical workers goggles should afford

suitable protection. If the eyes are contaminated, they should be flushed immediately with copious amounts of flowing water for at least 15 minutes. MEDICAL ATTENTION SHOULD THEN BE OBTAINED WITHOUT DELAY. Without prompt and adequate treatment some permanent impairment of vision may result. Prompt washing of contaminated eyes with water should reduce degree of irritation or injury.

The 10% solution in propylene glycol has a slight effect on the eye. Some pain and conjunctival irritation may persist for several days. Safety glasses should provide satisfactory protection for the safe handling of the dilute solutions. If the eyes are contaminated, they should be flushed immediately with copious amounts of flowing water and medical attention should be obtained if irritation persists or develops.

Skin Contact - Irritation and Absorption

The 100% material has a moderate to severe effect on intact and abraded skin. Severe hyperemia and edema may be expected to result from a 24 hour contact. Prolonged contact may cause blistering and a superficial burn. Precautions must be taken to prevent single prolonged or repeated skin contact with the 100% material. Protective, impermeable, clothing should be worn where the likelihood of contact exists. Also this material is quite readily absorbed through the skin. A single exposure

for 24 hours may result in absorption of lethal amounts.

In case of contact with the skin prompt removal of the material is essential if injury is to be avoided. Contaminated skin should be washed with plenty of soap and water. If contact occurs, all contaminated clothing, including shoes, should be removed immediately and the affected area of the skin should be cleansed thoroughly with soap and water. Medical attention should then be obtained. Contaminated clothing or shoes must be thoroughly cleaned before re-use or must be discarded.

The 10% solution in Dowanol 50B has a slight effect on intact and a moderate to severe effect on abraded skin. Repeated prolonged contact with the dilute solutions over a period of 24 hours may be expected to result in definite irritation. Good care and cleanliness should be exercised at all times when handling solutions of the material. Protective clothing should be worn as required by circumstances. Clothing or shoes grossly contaminated should be removed and cleansed before re-use. Any injuries or irritations which may develop should receive medical attention.

Inhalation

The subject material may present a definite problem from a single exposure to the vapor even at room temperature. The vapors

in concentrations sufficient to cause systemic injury probably are appreciably irritating and painful to the eye and nose. Exposure to the vapor of this material must be avoided. The material should be handled under a hood or in a well ventilated area.

For cleaning up accidental spills it is recommended that a full face gas mask equipped with a suitable canister be used in well ventilated areas or a self-contained breathing apparatus be used in poorly ventilated areas. If a person should experience any noticeable ill effects from breathing the vapors of this material, medical attention should be obtained promptly. If a person should accidentally be overcome by breathing the vapors, he should be removed to fresh air, be made to rest, kept warm and medical attention should be obtained immediately. If breathing stops artificial respiration should be administered.

SAMPLE INFORMATION

C. R. I. Name: Propane: 1,2-epoxy-3-allyloxy-

Common Name: Allyl glycidyl ether

Source: [REDACTED] (a Shell product)

Melting Point: -100°C

Boiling Point: 154°C

K Number: [REDACTED]

Date Request Received: 9-5-56

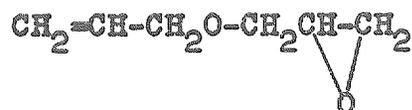
Date Sample Received: 9-5-56

Physical State: Colorless liquid

Soluble: Propylene glycol, Dowanol 50B

Molecular Formula: $\text{C}_6\text{H}_{10}\text{O}_2$

Structural Formula:



SUMMARY OF RANGE FINDING TOXICOLOGICAL DATA

Acute Oral Toxicity

<u>Animal</u>	<u>Preparation Fed</u>	<u>Dose (g./kg.)</u>	<u>No. Died No. Fed</u>	<u>Response-Remarks</u>
Rat	20% solution in corn oil	0.5	0/2	Moderate to severe lung and kidney damage, some hemorrhage gastritis at autopsy.
Rat	20% solution in corn oil	1.0	2/2	None.

Eye Contact - Rabbit

<u>Material</u>	<u>Treatment</u>	<u>Response-Remarks</u>
100%	Unwashed	Moderate pain and conjunctival swelling during first day of exposure. Iritis and corneal damage becomes severe with only slight recovery at end of one week. Internal cloudiness and slight iritis perceptible at one week.
100%	Washed with water	Severe conjunctivitis and corneal damage through 48 hour observation, - eye essentially healed in 48 hours.
10% in propylene glycol	Washed and unwashed	Slight to moderate conjunctivitis, essentially healed in 48 hours.

Skin Contact - Rabbit

<u>Material</u>	<u>Condition of Skin</u>	<u>No. of Appl.</u>	<u>Site</u>	<u>Response-Remarks</u>
100%	Intact	1	Abdomen	Severe hyperemia and edema with slight necrosis following first application. Note: This animal died from the systemic effects of skin absorption.
10% solution in Dowanol 50B	Intact	10	Ear	Slight exfoliation after second week.
10% solution in Dowanol 50B	Intact	10	Abdomen	Moderate to severe edema after first and second dose, subsiding after fifth dose. Slight to moderate exfoliation, subsiding after last application.
10% solution in Dowanol 50B	Abraded	2	Abdomen	Severe to moderate hyperemia following first dose, moderate edema subsiding after last dose. Deep necrosis resulting in raw ulcerated area with scar and ulceration at 21 days.

Skin Absorption - Rabbit (24-hour "cuff" application)

<u>Material</u>	<u>Dose (g./kg.)</u>	<u>No. Died / No. Applied</u>	<u>Response-Remarks</u>
50% solution in Dowanol 50B	0.25	0/2	Skin burned, heavily scabbed.
50% solution in Dowanol 50B	0.5	1/2	Animal died one week after application.
50% solution in Dowanol 50B	1.0	2/2	Animals died overnight.

Biochemical Research Department



Inhalation (Saturated Atmosphere)

<u>Animal</u>	<u>Bath Temp.</u>	<u>Hours Exposed</u>	<u>No. Died No. Treated</u>	<u>Response-Remarks</u>
Rat	Room	0.5	0/3	Animals showed signs of difficult breathing, slight eye and nasal irritation - slight kidney hydronephrosis on autopsy.
Rat	Room	1.0	0/3	Similar to above.
Rat	Room	3.0	4/4	Immediate eye and nasal irritation, immediate gasping for breath. Animals dead upon removal from chamber.

878214852

Biochemical Research Department

Page 11

UNIT INDEX

Effects resulting from ingestion, eye contact, skin contact and inhalation are given. Hazards, precautions for safe handling, and first aid measures are discussed.

INDEX HEADINGS

C. R. I. Name: Propane: 1,2-epoxy-3-allyloxy-

Common Name: Allyl glycidyl ether

DISTRIBUTION

000013