

OFFICE OF TOXIC SUBSTANCES
CODING FORM FOR GLOBAL INDEXING

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Biochemical Research Laboratory

The Dow Chemical Company

RESULTS OF RANGE FINDING TOXICOLOGICAL
TESTS ON 3-BROMO-1,2-EPOXY PROPANE
(EPIBROMOHYDRIN)

Signed Tom Olson, Mar. 1, '63

Checked F. O. Jensen 3-1-63

File

K No.

Chg.

Ref.

Sub. By J. J. Pedjac

Rept. By K. J. Olson

Tom Olson, Mar 11, '63

PROBLEM

It is understood that the subject material may become a product. A sample was submitted to the Biochemical Research Laboratory for toxicological investigation and definition of industrial handling hazards. It was further requested that this material be compared to Epichlorohydrin from a toxicological viewpoint.

CONCLUSIONS

Epibromohydrin possesses a moderate toxicity from an acute ingestion viewpoint. The material should pose no problem from ingestion incidental to industrial handling, but it should be emphasized that swallowing of relatively small amounts might result in serious internal injury.

The undiluted material is moderately irritating to the eye. Direct contact might produce conjunctival swelling, corneal injury and some iritis all of which would be expected to subside within one week. Safety glasses with side shields should be worn while handling the material whenever the likelihood of eye contact exists. There is indication that the vapors may irritate the eye. As an eye irritant, the material appears to be somewhat less injurious than epichlorohydrin but it seems to possess the characteristic of producing delayed effects

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in a similar manner. Corneal injury might not be evident for several hours following contact. The material studied at 1% in propylene glycol in the laboratory is only slightly irritating to the eye.

The undiluted material is capable of producing severe skin reactions; particularly if confined to skin in a manner that prevents evaporation. The material appears to be a vesicant capable of producing blisters in humans. In addition to this the subject material is undoubtedly a potent skin sensitizing agent. Contact with relatively minute amounts on a repeated basis might sensitize the skin and subsequently produce an allergic, edematous, contact-type dermatitis which in some people might become extensive and severe. In addition to the sensitizing and primary irritating properties of the material, laboratory studies conducted on rabbits indicate that the material is absorbed through the skin and that contact with relatively small amounts might result in serious internal injury even death. It is important to avoid all skin contact with the subject material. Protective clothing should be worn for industrial handling whenever the likelihood of skin contact exists.

Results of range finding inhalation studies conducted on rats reveal that the material poses a serious hazard from the viewpoint of vapor inhalation. The material has a high vapor pressure. It is possible under conditions of room temperature to inhale vapors sufficient to result in serious injury to the eye, to the lung, and to internal organs. Exposure to the vapors should be avoided. The material should be handled under a hood at all times. For cleaning up spills a gas mask equipped with a suitable canister should be used in well ventilated areas and a self-contained breathing apparatus should be used in poorly ventilated areas.

For all practical purposes the toxicological properties of the subject material are similar to those of epichlorohydrin. Precautions for safe handling of the material should be considered essentially the same.

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.

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SUMMARY OF RANGE FINDING TOXICOLOGICAL DATAAcute 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	2.5% solution in corn oil	0.126	0/2	Some liver and kidney injury observed at autopsy.
Rat	2.5% solution in corn oil	0.252	1/2	Essentially the same as above.
Rat	2.5% solution in corn oil	0.50	3/3	Pathology animal died.

Eye Contact - Rabbit

<u>Material</u>	<u>Treatment</u>	<u>Response-Remarks</u>
Undiluted	Unwashed	Moderate conjunctivitis, corneal injury and slight iritis essentially subsided in one week. Corneal injury was delayed for at least one hour.
Undiluted	Washed with water	Slight conjunctivitis and iritis subsided in 24 hours.
1% in propylene glycol	Washed and unwashed	Slight conjunctivitis subsided in 24 hours.

Skin Contact - Rabbit

<u>Material</u>	<u>Condition of Skin</u>	<u>No. of Appl.</u>	<u>Site</u>	<u>Response-Remarks</u>
Undiluted	Intact	6	Ear	Essentially no reaction observed following 1st five applications. Extensive swelling followed 6th.
Undiluted	Intact	1	Belly	Extensive hyperemia and swelling appeared after 1st four applications. Skin appeared burned on 4th day. Extensive scab formation.
Undiluted	Abraded	1	Belly	Essentially the same as above.
1% solution in Dowanol DPM	Intact	10	Ear	No irritation observed.
1% solution in Dowanol DPM	Intact	10	Belly	Slight exfoliation.
1% solution in Dowanol DPM	Abraded	2	Belly	Slight to moderate hyperemia. Moderate burn followed 2nd application. Skin healed with moderate scar.

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Skin Contact Absorption - Rabbit (Cuff Technique)

<u>Material</u>	<u>Duration of Exposure</u>	<u>Dose (g./kg.)</u>	<u>No. Died No. Exposed</u>	<u>Response-Remarks</u>
6.3% solution in Dowanol DPM	24 hours	0.126	0/2	Slight to moderate hyperemia and edema upon removal of cuff. Otherwise animals appeared normal during and after exposure.
50% solution in Dowanol DPM	24 hours	0.252	1/2	Moderate hyperemia, edema and necrosis upon removal of cuff.
50% solution in Dowanol DPM	24 hours	0.50	2/2	Animals died overnight.

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	12 min.	0/4	Animals appeared sick upon removal from chamber. Pathology essentially negative. 52,000 ppm estimated saturated atmosphere.
Rat	Room	0.5 hrs.	4/4	Animals died overnight. Kidney and liver injury observed upon autopsy.

Animals had eyes closed during vapor exposure indicating irritation to eyes.

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FIRST AID MEASURES

EYE CONTACT	<input checked="" type="checkbox"/> If the eyes are contaminated, they should be flushed immediately with copious amounts of flowing water for at least 15 minutes. <input type="checkbox"/> Medical attention should be obtained if irritation persists or develops after washing of the eyes. <input checked="" type="checkbox"/> Medical attention should be obtained. <input type="checkbox"/> MEDICAL ATTENTION SHOULD THEN BE OBTAINED WITHOUT DELAY.
SKIN CONTACT	<input checked="" type="checkbox"/> Any injuries or irritations which may develop should receive medical attention. <input type="checkbox"/> Contaminated clothing and shoes should be removed and not re-used until thoroughly cleaned. <input type="checkbox"/> Wash contaminated skin with soap and plenty of water. <input checked="" type="checkbox"/> Contaminated clothing, including shoes, should be removed and the affected skin area should be washed thoroughly with soap and plenty of water. <input type="checkbox"/> Medical attention should then be obtained. <input checked="" type="checkbox"/> Contaminated clothing and shoes should not be re-used until thoroughly cleaned. <input type="checkbox"/> All contaminated clothing, including shoes, must be removed immediately and the affected skin area flushed thoroughly with water from a safety shower, or other suitable device and cleaned with soap and plenty of water. <input type="checkbox"/> MEDICAL ATTENTION MUST THEN BE OBTAINED AS RAPIDLY AS POSSIBLE. <input type="checkbox"/> Contaminated clothing including shoes, must not be re-used until thoroughly cleaned or must be discarded.
INHALATION	<input checked="" type="checkbox"/> If a person should experience any noticeable ill effects from breathing the vapor or fumes of this material, medical attention should be obtained promptly. <input type="checkbox"/> If a person should be overcome from breathing this material, he should be removed to fresh air at once, be made to rest, kept warm, and MEDICAL ATTENTION SHOULD BE OBTAINED IMMEDIATELY. If breathing stops, artificial respiration should be administered.
INGESTION	<input type="checkbox"/> If appreciable amounts of material are swallowed, vomiting should be induced by tickling the back of the tongue with the finger or by giving an emetic such as 2 tablespoonsful of table salt in a glass of warm water. Medical attention should then be obtained. <input type="checkbox"/> If the material is swallowed, vomiting must be induced by tickling the back of the tongue with the finger or by giving an emetic such as 2 tablespoonsful of table salt in a glass of warm water. MEDICAL ATTENTION SHOULD THEN BE OBTAINED WITHOUT DELAY

COMMENTS:

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