

Microfiche No. OTS0535789		
New Doc I.D. 88-920001094	Old Doc I.D. 8EHQ-0292-245L	
Date Produced 1/21/75	Date Received 2/27/92	TSCA section BECP.
Submitting Organization OCCIDENTAL CHEM CORP		
Contractor BIO/TOX RES LABS		
Document Title INITIAL SUBMISSION; ACUTE DERMAL TOXICITY AND IRRITATION OF SODIUM CHROMATE TETRAHYDRATE IN ALBINO RABBITS (FINAL REPORT) WITH COVER LETTER DATED 022192		
Chemical Category SODIUM CHROMATE TETRAHYDRATE		

2452

8(e)

CAP

(Compliance Audit Program)

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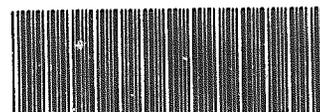
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Document Processing Center (TS-790)
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Environmental Protection Agency
401 M Street, SW
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Attention: Section 8(e) Coordinator (CAP Agreement)



88920001094

Subject: Occidental Chemical Corporation ("OxyChem")
Toxic Substances Control Act ("TSCA")
Section 8(e) Compliance Audit Program
Agreement No. 8ECAP-0063

Dear Sir:

Attached find one original and two copies of the following document:

- ♦ Acute Dermal Toxicity and Irritation of Sodium Chromate Tetrahydrate in Albino Rabbits

This document is being submitted pursuant to the TSCA Section 8(e) Compliance Audit Program ("CAP") and a CAP agreement executed between OxyChem and the U. S. Environmental Protection Agency (Agreement No. 8ECAP-0063).

The identity of the chemical(s) tested in the study listed above are as follows:

- ♦ Sodium Chromate Tetrahydrate, CAS# 7775-11-3.

The adverse effect(s) noted in the study listed above are as follows:

- ♦ The acute dermal (LD50) toxicity to albino rabbits at 24 hours was 101 mg/kg. The primary lesions observed were in the skin and kidneys.

If you have any questions on the information contained herein, please contact me at (716) 286-3358.

Sincerely,

Ladd W. Smith
Director, Product Stewardship



Occidental Chemical Corporation

Corporate Environmental Affairs

Occidental Chemical Center

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Acute Dermal Toxicity And
Irritation Of Sodium Chromate
Tetrahydrate In Albino Rabbits

Final Report

Prepared For:

Diamond Shamrock Chemical Company

P. O. Box 191

Painesville, Ohio 44077

Mr. R. G. Banner

Project Number:

28-102C

Report Date:

January 21, 1975



Acute Dermal Toxicity And
Irritation Of Sodium Chromate
Tetrahydrate In Albino Rabbits

Summary:

24-hour application of Sodium Chromate Tetrahydrate to the intact and abraded skin of albino rabbits produced mild to severe initial erythema and edema which was dose related. Deep irritation and bruising occurred. Two rabbits at 1000 mg/kg showed corrosion of the skin, animals in lower groups showed superficial sloughing of the epidermis in several instances. Three of four animals survived at 64 mg/kg, 1/4 at 160 mg/kg. All animals died at 400 and 1000 mg/kg, deaths occurring from 24 hours to nine days post application. Gross lesions were decidedly more frequent in the three higher dosage groups and consisted primarily of skin and kidney lesions and diarrhea. Based on test results, the Dermal LD₅₀ is 101.2 mg/kg with 95% confidence limits of 52.9-193.4 mg/kg. The 48 hour LD₅₀ is considerably higher due to the delayed deaths, at 400 mg/kg and the estimated skin irritation index is 3.2.





Materials:

1. Test Material - Approximately 250 g. of a yellow granule labeled "Sodium Chromate Tetrahydrate" was received from the Diamond Shamrock Chemical Company.
2. Test Animals - Young adult New Zealand White (albino) rabbits, weighing 2.13 to 2.92 kg. at the initiation of the test.

Methods:

Sixteen albino rabbits were divided into four equal groups by weight and sex. The animals were clipped and shaved over the dorsal part of the body to below the horizontal midline. Half the animals in each group were further prepared by making epidermal abrasions in the application area with a sterile needle.

The animals were rested for 24 hours to allow any shaving irritation to subside, then were abraded where necessary and the test material was applied at levels of 64, 160, 400 and 1000 mg/kg based on body weights obtained just before dosing.

The material was applied on the shaved dorsal area after being moistened with water and spread over the contact area. The area was loosely occluded with latex dental dam and a gauze covering was placed over this to preclude ingestion of the test material.

After a 24-hour application, the wraps were removed, the area washed to remove remaining compound and the initial observations were noted.





Rabbits were observed daily for mortality and toxic effects and skin condition was evaluated daily according to the Draize method as described in the Federal Hazardous Substances Act.

All animals which died on study and all survivors at 14 days were subjected to gross necropsy examination and survivors were weighed at termination.

Results:

Deaths were spread over an 11-day period but generally occurred sooner and with greater frequency in a dose related manner. Mortality figures are summarized below:

	TIME OF DEATH - DAYS					<u>Total Deaths</u>
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4-7</u>	<u>8-14</u>	
64 mg/kg				X		1
160 mg/kg	X		X		X	3
400 mg/kg	X	XX		X		4
1000 mg/kg	XX			X	X	4

The typical symptoms were depression and anorexia followed shortly by death. Some diarrhea was seen particular at high dosages. All surviving animals at 64 mg/kg gained weight over the course of the test, the one survivor at 160 mg/kg maintained the same weight.





Skin reactions were evaluated in the low and high level groups on an average daily score basis (where possible) for edema and erythema. A 72-hour scoring was also taken on animals which survived to that time in order to develop an estimated Primary Skin Irritation Index similar to that described in the Federal Hazardous Substances Act. Dermal LD₅₀'s were developed for both 48-hour and 14-day observation periods, the 48-hour to simulate the Department of Transportation definition of a class B poison; the 14-day to determine the Dermal LD₅₀ in the standard manner, the basic premise of the test.

Average daily irritation scores are shown below for the low and high level groups. There are many variables that influence these figures--they are presented to show the dose relation in the skin reactions.

	<u>AVERAGE DAILY IRRITATION SCORES</u>	
	<u>64 mg/kg</u>	<u>1000 mg/kg</u>
Edema	.536	1.563
Erythema	1.072	3.250

Skin reactions did not seem to be influenced by abrasion or lack of it, nor did deaths. One rabbit at 64 mg/kg showed no reaction at all, an occurrence which is not uncommon in animal testing for a





number of possible reasons such as, individual resistance, heavily keratinized or oily skin or loss of test material. In animals which survived for more than 72 hours, edema was nearly gone while erythema was still evident up to 5-6 days. One rabbit showed a slight erythema score at 14 days. Scaling of the superficial epidermis developed in 3 days, and corrosive activity and bruising occurred at 24 hours. Two animals at 1000 mg/kg showed corrosive damage which was confirmed at necropsy, although it was not wide-spread destruction, the damage was full thickness and either unhealed or being replaced by scar tissue in 0.5 cm round areas.

Primary Irritation Scores were estimated from 64 and 1000 mg/kg animals which lived at least 72 hours. The amount applied to these animals was less than specified in the Federal Hazardous Substances Act, but were the only available readings due to the toxic nature of the test substance. The estimated index is 3.2, a score which indicates moderate to severe irritancy when taken in the usual sense. Upon consideration of the overall picture presented in the test, we feel this is a low estimate.

Gross necropsy revealed numerous signs and lesions which were somewhat evenly distributed over the upper three dosage groups. Only the 64 mg/kg group had a noticeably lower incidence of gross lesions at necropsy. Most lesions are readily explained: Skin lesions due to contact; lung lesions and diarrhea are common in stressed rabbits, and kidney lesions (which were slight, except in 3 cases) might be the result of the expected kidney insult of the





test material. The incidence of gross lesions is summarized below:

	Incidence of Gross Lesions			
	<u>64 mg/kg</u>	<u>160 mg/kg</u>	<u>400 mg/kg</u>	<u>1000 mg/kg</u>
<u>Skin</u>				
stained		XX		
bruised		XX	XX	XXX
erythema	X	XX	XX	X
corrosion				XX
superficial slough	X	X		
scabs		X		X
<u>Lungs</u>				
bronchiectasis	X	X		
congested				XX
mottled				X
<u>Kidneys</u>				
mottled	X	X	X	
petechiae		X	X	
pale	X		X	X
pitted		X	X	X
reduced cortex				
hemorrhagic C-M line	X			
fibrous		X		
<u>Diarrhea</u>		X	X	XX
<u>Salivation</u>		X	X	X
<u>Liver</u>				
prominent lobules		X		
mottled	X			
<u>Spleen</u>				
enlarged	X			

The standard dermal LD₅₀ was calculated by the method of Weil (1952) to be 101.2 mg/kg with 95% confidence limits of 52.94--193.40 mg/kg. On examination of mortality to determine a 48-hour LD₅₀, a considerably different picture was seen, resulting in a 48-hour LD₅₀ of 399.9 mg/kg with very wide confidence limits of 75 to





2, 130 mg/kg. The 48-hour LD₅₀ is an attempt to estimate the ability of the test material to meet or exceed the DOT definition of a class B poison by the dermal route and is not the test defined in the regulation (49 CFR 173.343 (a)(3)).

From the results of this test, it appears Sodium Chromate Tetrahydrate is probably severely irritating, can be corrosive by DOT definitions when applied to the skin of albino rabbits, and is highly toxic by the dermal route.

Submitted By: *Thomas F. Hastings*
THOMAS F. HASTINGS, D.V.M.
Project Manager - Toxicology

Approved By: *D. Clifford Jessup*
D. CLIFFORD JESSUP, Ph.D.
Director



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