10-5-93

069005

ECOLOGICAL EFFECTS AND TECHNICAL MANAGEMENT SECTION

Disinfectants Branch

Toxicology Review

Reviewed by James E. Wilson, Jr. Date 10/05/93

EPA Reg. No. or File Symbol 397-RG

Date Received by Division 05/19/93

Data Accession Numbers MRID NOS. 427796-02, 03, 04, 05, 06, 07

Product Manager John Lee (31)

Product Name STERI-FAB

Company Name Noble Pine Products Company

Submission Type New Application

Formulation Liquid - Spray Application

Active Ingredients	%
*3-Phenoxybenzyl d-cis and tran**2,2-dimethyl-3-(2-methylpropenyl)cyclopropanecarboxylate	0.230
Other isomers	0.010
n-Alkyl(C1450%, C1240%, C1610%) dimethyl benzyl ammonium chloride	0.076
Didecyl dimethyl ammonium chloride	0.114
Isopropyl alcohol	60.390

BACKGROUND

The product will be used as general disinfectant and applied as a spray.

RECOMMENDATIONS

The data submitted are adequate to place the product tested in the following toxicity categories:

Acute Oral	4
Acute Dermal	3
Acute Inhalation	3
Eye Irritation	2
Skin Irritation	3
Dermal Sensitization	Negative

LABEL COMMENTS

1. Change the signal word "Caution" to "Warning".
2. The correct child hazard statement is "Keep Out of Reach of Children".
3. The statement directing the user to other precautions must be more precise, i.e., "See additional precautions on side panel" or "...back panel".
4. Consolidate the 'Hazards to Humans and Domestic Animals" in one section. The statements should read "Harmful if inhaled. Causes eye and skin irritation. Do not breathe vapors or spray mist. Do not get in eyes. Avoid contact with skin.'
5. Include a Statement of Practical Treatment section which addresses the setps to be taken in case of inhalation exposure and eye contact.

DATA REVIEW

All studies were conducted by Product Safety Labs, located at 725 Cranbury Road, East Brunswick, NJ 08816. The studies were completed between April 5 and 13, 1993. MRID Numbers for the studies are listed below:

Acute Oral	-	427796-03
Acute Dermal	-	427796-06
Acute Inhalation	-	427796-07
Eye Irritation	-	427796-04
Dermal Irritation	-	427796-05
Dermal Sensitization	-	427796-02

ACUTE ORAL

METHOD

Five male and five female fasted rats were selected based on body weight and health status. All rats weighed between 199 and 226 grams. Five grams per kilogram body weight of the undiluted liquid test material was delivered via syringe and intubation needle; the dose was calculated based of fasted body weight. All animals were observed for several hours after dosing and at least once daily thereafter for gross signs of toxicity and mortality. Body weights were recorded initially and on days 7 and 14. Gross necropsies were performed on all survivors.

RESULTS

Hunched posture, irregular respiration, lethargic behavior, loss of balance were the signs most prevalent on the initial day and persisted up to 24 hours after dosing. All rats exhibited normal activity after one day and body weight gains were in the normal range. Gross necropsy examinations revealed moderately red lungs in all rats.

CONCLUSION

The acute oral LD50 of the product is greater than 5g/kg. The product should be placed in Toxicity Category 4 for oral toxicity.

ACUTE DERMAL

METHOD

The dorsal fur was clipped from the backs of five male and five female rabbits weighing between 2.5 and 3.0 kg. Two grams/kg body weight of the undiluted test material was placed on the clipped area prior the occluding the trunk for 24 hours. All rabbits were observed for mortality and signs of gross toxicity 1, 2, 18 and 24 hours after application; thereafter observations were made at least once daily for 14 days. Gross necropsy examinations were performed on all survivors.

RESULTS

No mortality or gross signs of toxicity were observed. All tissues appeared normal.

CONCLUSION

The acute dermal LD50 is greater than 2.0 g/kg in rabbits.

ACUTE INHALATION

METHOD

Three groups of rats, each group containing five male and five female rats, were selected to be exposed to 1.02, 2.05 and 4.80 mg/l of the test material for 4.5 hours. There is no indication that the animals were fasted. The exposure chamber with a volume of 100 liters was operated under slight negative pressure with an air supply pressure of 21 psi. Temperature and humidity ranges were recorded for the chamber as well as the surrounding room. The test material was delivered by pump through an atomization nozzle. Chamber concentrations were measured gravimetrically 7 or 8 times from the breathing zones of the animals. Particle size distribution was assessed and air flow was monitored throughout the exposure period. Pre-test trials were conducted to establish procedures and conditions necessary to attain desired concentrations and particle size distribution.

Animals were observed every 15 minutes during the first hour of exposure and every 30 minutes thereafter. After removal from chamber observations were made at least once daily. Body weights were recorded prior to exposure and on days 7 and 14 or after death. Gross necropsy examinations were performed on all animals.

RESULTS

Hunched posture, irregular or labored respiration, lethargic behavior, and loss of balance were the most frequently reported signs in all groups. In the 2.05 and 4.80 mg/l groups, absence of feces or reduced feces was noted in addition to nasal discharge and facial and ano-genital staining.

Particle sizes ranged from 1.25 to 1.44 microns in the 1.02 and 2.05 exposure levels. Nominal chamber concentrations were 72.88, 79.03 and 158.20 mg/l for exposure levels of 1.02, 2.05 and 4.80 mg/l respectively.

Two female rats in groups 1.02 and 2.05 died within 24 hours after exposure. All rats in the 4.80 group died by day 2. Gross necropsy examinations of decedents revealed discolored lungs, gastro-intestinal tract and liver and distention of the gastro-intestinal tract in groups 1.02 and 2.05. These signs in addition to lungs which appeared edematous were found in the 4.80 group. Gross necropsy at terminal sacrifice was unremarkable except for red lung discoloration which is consistent with euthanasia by CO_2 inhalation.

CONCLUSION

The LC50 for the product is 2.31 (1.30 - 4.06) mg/l for both sexes. The LC50 for males is 2.50 (2.01 - 3.11) mg/l; the data do

not permit the calculation of an LD50 in females which was estimated to be 1.65 mg/l. Based on the data the product should be placed in Toxicity Category 3 for inhalation toxicity.

DERMAL IRRITATION

METHOD

The dorsal area of six rabbits was clipped free of hair and 0.5 ml of the undiluted test material was placed on the intact sites. The areas were covered with a semi-occlusive dressing for 4 hours; after the exposure period the coverings were removed and the areas wiped clean. The sites were observed for erythema and edema 1, 24, 48 and 72 hours and at 7 and 10 days.

RESULTS

Mild erythema was found at all sites and mild edema was noted at 4/6 sites one hour after patch removal. Erythema (3/6) and edema (1/6) remained mild at the 24 hour reading. Edema remained the same after 48 hours while erythema increased to moderate at two sites and was slight at the other four sites. After 72 hours erythema was moderate at 4 sites and slight at one, edema was moderate at two sites and slight at two. Mild to moderate erythema was seen after 7 days at 5/6 sites and cleared after 10 days. Hyperkeratosis was seen at 5/6 sites on day seven and persisted through day 10.

CONCLUSION

The product should be placed in Toxicity Category 3 for dermal irritation.

EYE IRRITATION

METHOD

Six rabbits which had lesion free eyes were selected for the test. One-tenth ml of the undiluted test material was placed in the conjunctival sac of the right eye of each rabbit. The eyes were not irrigated. Ocular lesions were evaluated 1, 24, 48 and 72 hours and 4, 7, 10, 14 and 17 days after application.

RESULTS

Mild corneal opacity, moderate iritis, and moderate conjunctival irritation were found in most eyes through the 48 hour reading. After 72 hours mild opacity was found in 4 eyes, iritis in one and mild to moderate conjunctival irritation in all. Conjunctival irritation persisted past day 4 in four eyes. Three were found to have irritation on day 7 and 1 on day 10.

CONCLUSION

The product should be placed in Toxicity Category 2 for eye irritation.

DERMAL SENSITIZATION

METHOD

Prior to the induction phase, a study was conducted to determine the minimally irritating concentration. Concentrations of 100, 75, 50, and 25 % were placed on 4 guinea pigs, which had been clipped of dorsal hair, for 6 hours. Each site was separated by a midline. Based on the results 100% was chosen for both the induction and challenge doses.

Twenty guinea pigs were divided into two groups, a test group and a positive control group. After the dorsal hair was removed from each animal, 0.4 ml of the undiluted test material was placed on each of 10 pigs. Likewise, 0.4 ml of a 0.08% w/w solution in aqueous ethanol of DNCB was administered to the positive controls. The chambers were left in place for 6 hours, afterwhich, they were removed and the areas wiped clean of any residual material. Local irritation was evaluated 24 and 48 hours after each induction application. The process was repeated the same day each week until three dose applications had been made. Fourteen days after the third inducton dose a challenge dose was applied to a naive site. For the test substance 100% was used and a solution of 0.03% w/w in acetone of DNCB was used.

A group of naive 10 controls were used at challenge time.

RESULTS

Mild irritation was noted 24 hours after the first induction application in 6/10 animals; the number affected increased to 8/10 after 48 hours. Moderate irritation was noted 24 and 48 hours after the 2nd and 3rd induction applications. Basically the same reactions were noted in the positive controls.

Mild irritation was observed after 24 hours at two sites and 3 sites after 48 hours in the test group. Mild to moderate irritation was seen in the positive control group at all sites after 24 hours and 7/10 sites after 48 hours.

In the naive control group slight irritation was present after 24 hours at all sites and one site after 48 hours.

CONCLUSION

The product is not a dermal sensitizer under the conditions tested.