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AGENCY ABERDEEN PROVING GROUND MD M H WEEKS ET AL.
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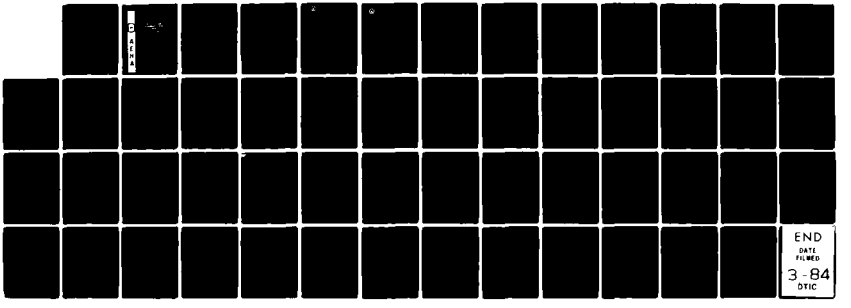

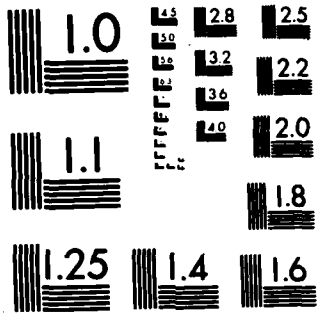

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UNITED STATES ARMY ENVIRONMENTAL HYGIENE AGENCY

ABERDEEN PROVING GROUND, MD 21010

AEHA

PRELIMINARY ASSESSMENT OF THE RELATIVE TOXICITY OF CANDIDATE DISINFECTANT, FOOD SERVICE (CHLORINE-IODINE TYPE) NSN 6840-00-810-6396 AND TRICHLOROMELAMINE
STUDY NO. 75-51-0195-84

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Health Hazard	Acute Dermal	Potassium Iodide
Disinfectant	Oral	Citric Acid
Food Service	Skin Irritant	Sodium Alkyl Aryl Sulfonate
Trichloromelamine	Eye Irritant	Monosodium Dihydrogen Phosphate
Toxicity	NSN 6840-00-810-6396	Sanitizing Solutions

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The toxicity of the candidate disinfectant, food service (chlorine-iodine type) NSN 6840-00-810-6396 and trichloromelamine was studied by means of acute oral and dermal application to rats, rabbits, and guinea pigs. The proposed "use" solutions of the complete disinfectant mixture were found to be nonirritating to skin or eyes and does not pose a health hazard risk from acute dermal or oral exposures. The complete dry mixture was corrosive to the skin and eyes and was relatively toxic in concentrated solutions by oral and dermal routes. Washing of the eyes was found to reduce the corrosive effects of the disinfectant.

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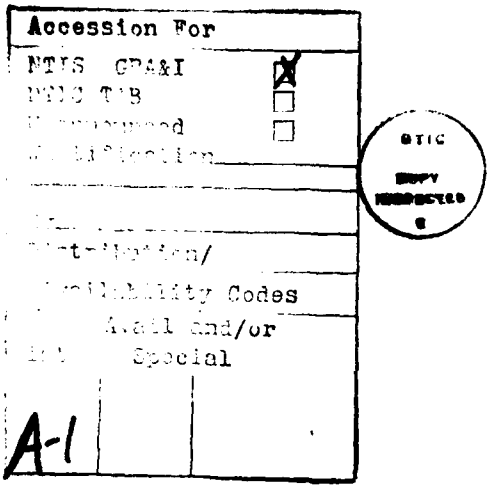
19. Rats
MIL-D-11309E
Rabbits
Guinea Pigs
Sensitization
Pouch A
Pouch B
Ames Test
Draize Test



DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND MARYLAND 21010

Mr. Weeks/orl/AUTOVON
584-3980

REPLY TO ATTENTION OF
HSHB-OT/WP

2 FEB 1984

SUBJECT: Preliminary Assessment of The Relative Toxicity of Candidate Disinfectant, Food Service (Chlorine-Iodine Type), NSN 6840-00-810-6396 and Trichloromelamine, Study No. 75-51-0195-84

Commander
US Army Materiel Development and
Readiness Command
ATTN: DRCSG
5001 Eisenhower Avenue
Alexandria, VA 22333

EXECUTIVE SUMMARY

The purpose, essential findings and conclusions of the inclosed report follow:

a. Purpose. The candidate disinfectant, food service, (chlorine-iodine type) is intended for sterilization of mess gear under field conditions when hot water is not available. The Food Sciences Laboratory, US Army Natick Research and Development Center is engaged in attempts to register this disinfectant for field use with the Environmental Protection Agency (EPA). Information on the acute effects in animals was obtained to support the registration of this disinfectant in accordance with the Federal Insecticide, Fungicide and Rodenticide Act.

b. Essential Findings. The proposed "use" solutions of the complete disinfectant mixture were found to be nonirritating to skin or eyes and does not pose a health hazard risk from acute dermal or oral exposures. The complete dry mixture was corrosive to the skin and eyes and was relatively toxic in concentrated solutions by oral and dermal routes. Washing of the eyes was found to reduce the corrosive effects of the disinfectant.

c. Conclusions. Based on the current study, the recommended "use" solution concentration of the proposed disinfectant has no potential for causing acute injurious effects. Concentrated solutions of this mixture are corrosive and should be used with care. Appropriate personal protection for handling strong acids and bases should be used.

FOR THE COMMANDER:

1 Incl
as

for Norbert M. Letzeiter
JOEL C. GAYDOS, M.D.
Colonel, MC
Director, Occupational and
Environmental Health

CF:
HQDA (DASG-PSP) wo incl
Cdr, TROSCOM
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DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010

REPLY TO ATTENTION OF

HSHB-OT/WP

PRELIMINARY ASSESSMENT OF THE RELATIVE TOXICITY OF CANDIDATE DISINFECTANT, FOOD SERVICE (CHLORINE-IODINE TYPE) NSN 6840-00-810-6396 AND TRICHLOROMELAMINE*†
STUDY NO. 75-51-0195-84

1. AUTHORITY. Letter, DRXNM-YPB, US Army Natick Research and Development Command, 1 July 1976, subject: Eye and Skin Irritation Tests for Disinfectant Food Service (Chlorine-Iodine Type), NSN 6840-00-810-6396 and Trichloromelamine (TCM) with indorsement thereto.

2. REFERENCE. See Appendix A for a listing of references. The Biliography is listed in Appendix KK.

3. PURPOSE. Animal studies were conducted to acquire information concerning the acute relative toxicity of subject disinfectant and its major constituents. These data were furnished to the Environmental Protection Agency (EPA) by the US Army Natick Research and Development Center (NARADCEN), Natick, Massachusetts (references 24 and 25), in preparation for the registration of the subject disinfectant in accordance with the Federal Insecticide, Fungicide and Rodenticide Act (reference 22).

4. BACKGROUND.

a. Sanitizing Agent.

(1) The subject food service disinfectant is intended for sterilization of mess gear under field conditions and only when hot water rinse is not available. The materials for preparing this solution rinse are furnished in a double compartmented pouch labeled Pouch "A" and Pouch "B".† These pouches contain chemicals sufficient for preparing 25 gallons of water containing approximately 160 mg/L of chlorine and 300 mg/L of iodine. The ingredients of the pouches as percent by weight are as follows:

Pouch "A"	
Trichloromelamine (TCM)	19.3
Anhydrous citric acid	27.8
Sodium alkyl aryl sulfonate	8.2
Anhydrous monosodium dihydrogen phosphate	6.1
Pouch "B"	
Potassium iodide (KI) USP	28.6

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* In conducting the studies described in this report, the investigators adhered to the "Guide for the Care and Use of Laboratory Animals", US Department of Health, Education and Welfare Publication No. NIH 78-23.
† The experiments reported herein were performed in animal facilities fully accredited by the American Association for the Accreditation of Laboratory Animal Care.
† The test pouches were formulated by the Chemical Compounding Company, Riverhead, New Jersey, and identified as Lot 0611-1. The TCM (Lot 409R) was produced by Union Camp Corporation, Wayne, New Jersey, in accordance with military specification MIL-D-11309E and by procedures originally published by Wallace and Tierman Inc., Belleville, New Jersey.

(2) The directions for use of the disinfectant are based on the treatment of 100 sets of mess gear. The contents of Pouch "A" and Pouch "B" are dissolved in a container holding 25 gallons of water. This procedure is repeated with a second container. The procedure for sterilizing mess gear is to first wash them clean in a scrub container, rinse twice, once in the first container of disinfectant solution and a final rinse in the second container of disinfectant solution. The mess gear is then air dried.

(3) The pouches can also be used for preparation of solutions for disinfectant of fresh vegetables and fruits. Directions for preparation of the solutions are different from those for the mess gear rinse. First, the fruits and vegetables are washed in a solution made by dissolving the contents of the two pouches into 20 gallons of water. This solution yields approximately 225 mg/L of chlorine and 300 mg/L of iodine. After washing, the fruits and vegetables are completely immersed for 10 minutes in a separate fresh solution prepared as above. After 10 minutes of immersion, the fruits and vegetables are rinsed thoroughly in potable water. This procedure has not been approved by the Food and Drug Administration (FDA) for use by the general public.

(4) The use of TCM in sanitizing solutions has been recognized by the FDA as being safe under some conditions. Aqueous solutions containing trichloromelamine and either sodium lauryl sulfate or dodecylbenzene-sulfonic acid has been approved for use on food-processing equipment and utensils and on other food-contact articles as specified in 21 CFR 178.1010. This solution may be used on beverage containers (except milk containers or equipment). However, these solutions shall provide not more than sufficient TCM to produce 200 parts per million of available chlorine and either sodium lauryl sulfate at a level not in excess of the minimum required to produce its intended functional effect or not more than 400 parts per million of dodecylbenzene-sulfonic acid [21 CFR 121.2547(b)(10) and (c)(7)]. Sac's hazard analysis of TCM states that the details of its toxicity are unknown, although animal experiments indicate a low order of oral toxicity. The mouse oral LD 50 has been reported as 490 mg/kg[2]. The TCM solutions are strong oxidizing agents and when in contact with organic matter, would be reduced to melamine. Depending, therefore, on the use of TCM, the toxicity of melamine might be considered in the overall hazard evaluation of TCM. A moderate number of investigations with melamine suggest that it may have a low order of biological activity.[1]

b. Toxicity of TCM. The results from a carcinogenicity study in rats and mice by the National Cancer Institute (NCI) are still being evaluated, but preliminary evidence indicates that it causes a significant number of bladder calculi with an increase in the incidence of urinary bladder neoplasms in male rats[2]. No evidence of bladder stones or of tumor formation was found in female rats or in male/female mice[2].

c. Toxicity of Other Ingredients. The acute toxicities of KI and of citric acid are very low with an oral LDL_0 of 1900 mg/kg for KI and a LD50 of 5000 mg/kg for citric acid in mice. Sodium alkyl aryl sulfonate and monosodium dihydrogen phosphate have not been extensively studied with only an intramuscular rat LD50 of 250 mg/kg being reported for the latter chemical.[3]

5. MATERIALS AND METHODS.

a. Materials.

(1) The materials under study were obtained from the Food Sciences Laboratory, NARADCEN. The composition of the two pouches were described in paragraph 4, this report. The various materials tested in animals were as follows:

(a) Trichloromelamine dry and as a wet paste.

(b) Potassium iodide dry and as a wet paste.

(c) Disinfectant mixture prepared as the aqueous "use" solution complete with KI for use with mess kits.

(d) Disinfectant mixture complete with KI as a dry brown powder.

(e) Disinfectant mixture complete with KI as a wet paste.

(f) Disinfectant Pouch "A" formulation as a dry white powder.

(g) Disinfectant Pouch "A" formulation as a wet paste.

Solutions and wet paste formulations were prepared with distilled water and used on the day of preparation. Details of amounts and volumes will be described separately for each test.

(2) Toxicological evaluations of the sanitizing products were conducted using New Zealand White rabbits for skin and eye studies, Hartley guinea pigs for a sensitization study and Sprague-Dawley, Wistar derived rats for determination of acute oral toxicity. One strain of yeast Saccharomyces cerevisiae and five strains of Salmonella typhimurium were used in evaluating the mutagenic potential of trichloromelamine. All animals were maintained on commercial chow and water ad libitum with a 12-hour, light-dark sequence. Ambient conditions were 24°C + 2°C and 40-60 percent relative humidity. Rabbits were housed in individual wire cages, while rats and guinea pigs were housed in groups of four to six in hanging wire gang cages.

(3) The results from the animal toxicity studies were categorized by the use of the hazard indicator table published in 40 CFR 162. They are described in Table 1.

TABLE 1. HAZARD INDICATORS

Hazard Indicators	TOXICITY CATEGORIES I	II	III	IV
Oral LD50	Up to and including 50 mg/kg.	From 50 thru 500 mg/kg.	From 500 thru 5000 mg/kg.	Greater than 5000 mg/kg.
Inhalation LD50	Up to and including 0.2 mg/L.	From 0.2 thru 2 mg/L.	From 2 thru 20 mg/L.	Greater than 20 mg/L.
Dermal LD50	Up to and including 200 mg/kg.	From 200 thru 2000....	From 2,000 thru 20,000....	Greater than 20,000.
Eye effects	Corrosive, corneal opacity not reversible within 7 days.	Corneal opacity reversible within 7 days; irritation persisting for 7 days.	No corneal opacity; irritation reversible within 7 days.	No irritation.
Skin effects	Corrosive	Severe irritation at 72 hours.	Moderate irritation at 72 hours.	Mild or slight irritation at 72 hours.

b. Methods.

(1) Primary Skin Irritation Studies. The test for acute primary skin irritation was performed to evaluate the potential for local toxic effects of chemicals expected to come in contact with the skin. It refers to one period of topical application for 24 hours (the exposure period) and an observation period of 7 days. In these studies, the irritant responses from either 0.5 gm or 0.5 mL of the disinfectant materials were evaluated following a single 24-hour application to occluded intact and abraded skin of New Zealand white rabbits. The Draize[4] scoring system (Appendix B) was used for evaluation of the skin reactions. A list of the test substances, conditions of application and the responses are found in Table 2 of the results section.

(2) Eye Irritation Studies. The test for acute eye irritation was performed to evaluate the toxicity of liquids and solids to ocular tissues of laboratory animals. The test determines the potential of a substance to produce injury to the human eye. It refers to one period of application into the conjunctival sac of one eye of each rabbit and an observation period of 7 days. In these studies, the eye was either washed out 20 seconds after application with warm distilled water for 1 minute or left unwashed. The Draize[4] scoring system (Appendix C) was used for the evaluation of eye responses. A list of the test substances, conditions of application and the responses are found in Table 3 of the results section.

(3) Acute Oral and Dermal Toxicity Studies. Acute toxicity studies are performed to determine the adverse effects occurring within a short period of time following a single dose of a substance. This type of study identifies the relative toxicity of a compound, investigates its mode of action and specific toxic effect, and determines the existence of species differences. The most frequently used acute toxicity test involves determination of the median lethal dose (LD50) of the compound. The LD50 is defined as a statistically derived expression of a single dose of a material that can be expected to be lethal to 50 percent of the treated animals (reference 3). In the present study, single doses of compound are administered to male rats by gavage and to male rabbits by 24-hour skin application under an occluded wrap. A 14-day observation period is used to observe death or clinical signs with animals being weighed at 1, 3, 7 and 14 days after exposure. A gross necropsy is performed on all survivors. Calculation of the LD50 is performed by the Method of Bliss as described by Finney[5]. A list of the test substances, conditions of application and the responses from the rat oral studies and the rabbit dermal studies are found in Tables 4 and 5 of the results section, respectively.

(4) Sensitization Studies. Skin sensitization is a phenomenon wherein the responses obtained by exposing the animal to a chemical through skin contact over a prolonged period of time are significantly greater than that obtained from a single exposure. The test procedure is based on the studies of Landsteiner[6] and used to predict possible strong skin sensitizing chemicals. The animal used is the male Hartley strain albino guinea pig. The test was conducted with 10 guinea pigs given intradermal (ID) injections of a 0.1 percent solution (w/v) of the chemical in saline. The injections were given every other day (for 3 weeks), after which the animals were rested for 2 weeks and then challenged with one ID injection of the same compound and concentration. A positive control dinitrochlorobenzene (DNCB), was run concurrently with the test substances. The substances tested were TCM, complete disinfectant mixture, and pouch "A."

(5) Mutagenicity Plate Assay§. The objective of this study was to evaluate TCM for genetic activity in microbial assays with and without the addition of mammalian metabolic activation preparations. One strain of yeast Saccharomyces cerevisiae (D4) and five strains of Salmonella typhimurium (TA-1535, TA-1537, TA-1538, TA-98 and TA-100) were used in evaluating mutagenic potential. Trichloromelamine was tested directly and in the presence of liver microsomal enzyme preparations from rats pretreated with Aroclor® 1254. The compound was tested over a series of concentrations ranging from 0.1 microgram to 500 microgram/plate. These concentrations were selected so that there was either quantitative or qualitative evidence of some chemically induced effects at the high dose level. The low dose was below a concentration that demonstrated any toxic effect.

6. RESULTS.

a. Skin Irritation Studies. The potential for primary skin irritation was tested by 24-hour application of the material to the intact and abraded skin of six rabbits. The dry materials, except for the disinfectant mixture, caused little skin irritation. The dry complete disinfectant mixture caused severe primary irritation of the intact skin and of the skin surrounding an abrasion, and in addition produced necrosis and vesiculation at 72 hours. The KI pastes produced mild or slight irritation, the TCM and contents of Pouch "A" produced moderate irritation, and the complete disinfectant mixture produced severe primary irritation with necrosis and vesiculation. The aqueous "use" disinfectant solution caused no irritant responses. Results from each application are shown in detail in Appendices D thru L. A summary of the skin responses from the test substances, conditions of application and EPA toxicity categories are shown in Table 2 as follows:

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§ Work performed under contract by Litton Bionetics, Kensington, MD (LBI Project No. 20838).

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TABLE 2. PRIMARY SKIN EVALUATION STUDY SHOWING THE TEST SUBSTANCES AND CONDITION PER APPLICATION WITH RESPONSE

Substance Condition of Application	Response	EPA Category
Trichloromelamine		
0.5 gm dry white powder	very slight irritation	IV
0.5 gm wet paste compound in 0.5 mL distilled water	moderate irritation	III
Potassium Iodide		
0.5 gm dry white crystalline powder	slight irritation	IV
0.5 gm wet paste of compound in 0.5 mL distilled water	slight irritation	IV
Disinfectant		
0.5 mL complete aqueous "use" solution with KI	no irritation	IV
0.5 gm dry brown powder of complete mixture with KI	severe irritation	II
0.5 gm wet paste of complete mixture in 0.5 mL distilled water	severe irritation	II
Pouch "A" Formulation		
0.5 gm dry powder mixture	slight irritation	IV
0.5 gm wet paste of Pouch "A" in 0.5 mL distilled water	moderate irritation	III

b. Eye Irritation Studies. The ability of the disinfectant materials for causing ocular damage was studied by application of each material to the eyes of each of 12 rabbits. The material was washed out from 6 rabbits after 20 seconds and allowed to remain overnight in the others. Dry TCM, Pouch "A" and complete disinfectant mixture caused corrosive corneal opacity not reversible within 7 days. Dry KI caused no corneal opacity with the slight

conjunctival irritation clearing within 7 days. The "use" solution of the complete disinfectant mixture caused no irritation to the eye. Washing the eye after application helped to reduce the corrosive response in all cases except for KI where washing increased the irritation. Results from each application are shown in detail in Appendices M thru V. A summary of the eye responses from the test substances, conditions of application and EPA toxicity categories are shown in Table 3.

TABLE 3. EYE IRRITATION EVALUATION STUDIES SHOWING THE TEST SUBSTANCES AND CONDITIONS PER APPLICATIONS WITH RESPONSE

Substance Condition of Application	Unwashed or Washed	Response	EPA Category
Trichloromelamine			
0.1 gm dry white powder;	unwashed	corrosive	I
	washed	moderate reversible injury	II
Potassium Iodide			
0.1 gm dry white crystalline powder	unwashed	moderate conjunctival irritation	III
	washed	mild reversible injury	II
Disinfectant			
0.1 ml complete aqueous "use" solution with KI	unwashed	no injury	IV
	washed	no injury	IV
0.1 gm dry brown powder of complete mixture with KI	unwashed	corrosive	I
	washed	moderate reversible cornea injury	II
Pouch "A" Formulation			
0.1 gm dry powder mixture	unwashed	corrosive	I
	washed	moderate reversible cornea injury	II

c. Acute Toxicity - Rats.

(1) Oral. In the acute oral toxicity studies, the test compounds were dissolved in distilled water for delivery to rats. Solutions of TCM and KI were used at a concentration of 500 mg/mL, the complete disinfectant at 1.7 mg/mL and 500 mg/mL and Pouch "A" at 300 mg/mL. The solutions were administered by stomach tube to mature male rats, and the LD_50's were calculated after a 14-day observation period. Signs in rats at lethal dosages were ataxia, weakness, convulsions and red exudate around the eyes with all compounds except the disinfectant "use" mixture, where no signs were seen. Results from each study are shown in detail in Appendices W thru AA. A summary of the rat oral LD50's from the various test substances, conditions of application and EPA toxicity categories are shown in Table 4.

TABLE 4. ACUTE RAT ORAL TOXICITY STUDIES SHOWING THE TEST SUBSTANCES, CONDITIONS PER APPLICATION AND LD50 VALUES

Substance Condition of Application	Response LD50 (95% C.L.)	EPA Category
Trichloromelamine concentration - 500 mg/mL	690 mg/kg (560-870 mg/kg)	III
Potassium Iodide concentration - 500 mg/mL	4800 mg/kg (4200-5500 mg/kg)	III
Disinfectant complete aqueous "use" solution with KI concentration 1.7 mg/mL	> 22 mL/kg (> 37 mg/kg)	--
complete aqueous solution with KI concentration - 500 mg/mL	2400 mg/kg (2000-2800 mg/kg)	III
Pouch "A" Formulation concentration - 300 mg/mL	3000 mg/kg (2500-3600 mg/kg)	III

(2) Acute Dermal Toxicity - Rabbits. The test compounds in acute dermal toxicity studies were administered in several different aqueous conditions. The test compounds when applied as a solid were mixed into a paste with equal quantities of distilled water (w/v). The complete disinfectant mixture was applied as a 2.5 percent w/v solution while TCM was used as a 9 percent solution. Signs in rabbits at lethal dosages were tremors and nasal discharge. Primary skin irritation progressing to necrosis was seen at all dosage levels. There were no gross changes in organs and tissues from decedents or survivors of rabbits receiving TCM or the complete disinfectant (25 mg/mL). Rabbits that died following application of the complete disinfectant as a wet paste showed fatty livers or early cirrhotic changes. Kidneys from these rabbits were fatty or diffusely hemorrhagic with clots in the pelvic area. Rabbits exposed to KI had caseous material in the urinary bladder with thickening of the wall. Pouch "A" also caused kidney effects, and free blood in the abdominal cavity with fibrin tags on the viscera, but no evidence of perforated viscera. Details of these studies are found in Appendicies BB thru GG. The rabbit dermal LD_{50} values, conditions of application and EPA catagories are summarized in Table 5 as follows:

TABLE 5. ACUTE RABBIT DERMAL TOXICITY STUDIES SHOWING THE TEST SUBSTANCES, CONDITIONS PER APPLICATION AND LD50 VALUES

Substance Condition of Application	Response LD50 (95% C.L.)	EPA Category
Trichloromelamine		
wet paste	10 g/kg (8.4-11.9 g/kg)	III
solution in distilled water- 90 mg/mL	2.2 g/kg (1.2-3.9 g/kg)	III
Potassium Iodide		
wet paste	3.7 g/kg (3.0-6.7 g/kg)	III
Disinfectant		
complete mixture - wet paste	2.6 g/kg (1.1-6.2 g/kg)	III
complete mixture concen- tration - 25 mg/mL	> 31.6 ml/kg (> 790 mg/kg)	--
Pouch "A" Formulation wet paste	2.7 g/kg (1.2-5.9 g/kg)	III

(3) Sensitization Studies. The inherent sensitization potential was studied in guinea pigs with 10 0.1 mL ID injections at a 0.1 percent solution in saline of TCM, complete disinfectant mixture with KI and the contents from Pouch "A" formulation of the disinfectant. A 3-week exposure period followed by a 2-week rest, then challenge with a single dose of the sensitizing solution, showed that the three test compounds produced no recognizable sensitization reactions. A concurrent group of guinea pigs was similarily tested using the known sensitizer dinitrochlorobenzene (DNCB). At challenge DNCB produced definite sensitization reactions in all treated animals. Details of the sensitization studies are shown in Appendices HH thru JJ.

(4) Mutagenic Screen. Trichloromelamine was tested for mutagenic activity using the standard Ames overlay method. Solutions were prepared in deionized water with the dose range employed ranging from 0.1 microgram to 500 micrograms per plate. It was toxic to all organisms at doses higher than 100 micrograms per plate. Positive and solvent controls using both directly active positive chemicals and those that require metabolic activation were run with each assay. The results were presented as revertants per plate for each indicated strain employed in the assay. Test results in the absence or the presence of the rat liver activation were all negative.

7. DISCUSSION.

a. Our studies have demonstrated dose dependent acute lethal effects resulting from exposure of animals to the concentrated disinfectant food service mixture and its components. These studies also showed that low concentration of the disinfectant at 2.5 percent and at "use" levels are not lethal and are nontoxic by the oral and dermal routes of administrations.

b. The physical condition of the materials was a major variable in skin irritation studies. Different responses of the skin were seen between application of the materials in a dry state or as a wet paste. The dry materials, except for the total disinfectant mixture, were less irritating to the skin than the wet. Translated to operating conditions, serious skin irritation could result from handling the wet paste or concentrated material of the disinfectant mixture. Interestingly the "use" solution was found to be noninjurious causing no skin or eye irritation responses.

c. The use of water to wash the material from the eyes was of some benefit in reducing the corrosive effect of the materials. Eye rinses should be available in the areas where these materials are handled and rinsing should be actively pursued in cases of accidental eye exposure.

d. The lack of gross changes in organs and tissues at necropsy of rabbits exposed to a 2.5 percent solution of the complete disinfectant is encouraging and reflects and reinforces the noninjurious nature of this solution. These findings also parallel and support the nonirritant skin and eye results obtained from the "use" mixture studies.

e. Overall, the data from our acute studies show that the "use" solution mixture does not pose a hazard from skin, eye or ingestion exposure. However, care should be taken to avoid eye or skin contact from the concentrated dry mixture, wet concentrates or pastes of these materials.

f. Although the acute problem with the disinfectant has been addressed, there are no data on the chronic effects of the mixture or of the major ingredient TCM. In addition, information on the environmental persistence of TCM is lacking and no occupational standard for exposure to TCM has been established by the Occupational Safety and Health Administration.

g. Trichloromelamine has never been evaluated for carcinogenicity. The chemical is a reactive compound with hydrolysis to melamine and hypochlorous acid expected to be the dominant reaction of the compound. As a result of the melamine findings, however, there may be some potential for TCM to be associated with the production of bladder calculi. The assumed similarity in metabolism of TCM should be considered in planning future long-term animal studies. Emphasis should be on examining the relationship between the projected exposure to TCM and potential hazard from serious toxicological consequences.

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MAJ, MC
Assistant for Chemical Warfare and
Health Hazard Evaluation

APPENDIX A

REFERENCES

1. Title 21, Code of Federal Regulations (CFR), 1982 rev, Part 58, Good Laboratory Practice for Nonclinical Laboratory Studies.

2. Title 40, CFR, 1982 rev, Part 162, Regulations for the Enforcement of the Federal Insecticide, Fungicide, and Rodenticide Act.

3. Toxicology Division Procedural Guide, US Army Environmental Hygiene Agency (USAEHA), 1972, revised 1976.

4. Letter, HSE-LT, this Agency, 14 December 1976, subject: Toxicity Data on Disinfectant Food Service, NSN 6840-00-810-6396, USAEHA Study Number 51-0924-76.

5. Letter, HSE-LT, this Agency, 20 April 1977, subject: Toxicity Data on Disinfectant Food Service, NSN 6840-00-810-6396, USAEHA Study Number 51-0924-76.

APPENDIX B

SCALE FOR SCORING SKIN LESIONS

DRAIZE SYSTEM

1.	ERYTHEMA AND ESCHAR FORMATION.	
	a. No erythema	0
	b. Very slight erythema (barely perceptible)	1
	c. Well defined erythema	2
	d. Moderate-to-severe erythema	3
	e. Severe erythema ("beet" redness to slight eschar formation injurious in depth)	4
	f. Possible total erythema score	4
2.	EDEMA FORMATION.	
	a. No edema	0
	b. Very slight edema (barely perceptible)	1
	c. Slight edema (edges of area well defined by definite raising)	2
	d. Moderate edema (edges raised *approximately 1 mm*)	3
	e. Severe edema (raised more than 1 mm and extending beyond area of exposure)	4
	f. Possible total edema score	4
3.	POSSIBLE TOTAL SCORE FOR PRIMARY IRRITATION.	8

APPENDIX C

SCALE FOR SCORING OCULAR LESIONS

DRAIZE SYSTEM

1. Cornea

a. Opacity-degree of density (most dense area taken for reading)
No opacity.....0
Scattered or diffuse area, details of iris clearly visible.....1
Easily discernible translucent areas, details of iris slightly obscured.....2
Opalescent areas, no details of iris visible, size of pupil barely discernible.....3
Opaque, iris invisible.....4

b. Area of cornea involved
One quarter (or less) but not zero.....1
Greater than one quarter but less than one half.....2
Greater than one half but less than three quarters.....3
Greater than three quarters up to whole area.....4

Score = (a) x (b) x (5) = Total max score = 80

2. Iris

a. Values
Normal.....0
Folds above normal, congestion, swelling, circumcorneal injection (any or all of these or combination of any thereof) iris still reacting to light (sluggish reaction is positive).....1
No reaction to light, hemorrhage, gross destruction (any or all of these).....2

Score = (a) x 5 Total max score = 10

3. Conjunctivae

a. Redness (refers to palpebral and bulbar conjunctivae excluding cornea and iris)
Vessels *normal*.....0
Vessels definitely injected above normal.....1
More diffuse, deeper crimson red, individual vessels not easily discernible.....2
Diffuse beefy red.....3

b. Chemosis

No swelling.....0
Any swelling above normal (included nictitating membrane).....1
Obvious swelling with partial eversion of lids.....2
Swelling with lids about half closed.....3
Swelling with lids about half closed to completely closed.....4

c. Discharge

No discharge.....0
Any amount different from normal (does not include small amounts observed in inner canthus of normal animals.....1
Discharge with moistening of the lids and hairs just adjacent to lids.....2
Discharge with moistening of the lids and hairs, and considerable area around the eye.....3

Score (a + b + c) x 2 Total max score = 20

APPENDIX D

COMPOUND: Trichloromelamine								USAEHA STUDY NO. 75-51-0195-84
PRIMARY SKIN EFFECTS NEW ZEALAND WHITE RABBITS		TOXICITY CATEGORY * IV						CONDITIONS - Dry Trichloromelamine - Single 24-hour application of 0.5 g dry white powder per skin application site.
	Time of Observation	Response Rabbit No.						
	Hours	1	2	3	4	5	6	Mean Score / Comments
Erythema & Eschar								
Intact Skin	24	0	0	0	0	0	0	0.00
Intact Skin	72	0	1	0	0	0	0	0.17
Abraded Skin	24	0	0	0	0	0	0	0.00
Abraded Skin	72	0	0	1	2	0	0	0.50
						Subtotal		0.67
Edema Formation								
Intact Skin	24	0	0	0	0	0	0	0.00
Intact Skin	72	0	0	0	0	0	0	0.00
Abraded Skin	24	1	0	0	0	1	0	0.33
Abraded Skin	72	0	0	1	0	0	0	0.17
						Subtotal		0.50
						Total		1.17

Category IV compounds are compounds producing none, mild or slight irritation at 72 hours.

* 40 CFR 162

Skin reactions are evaluated using Draize scoring systems. Draize, J.H., Woodward, G. and Calvary, H.O., Methods for the Study of Irritation of Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 777, 490, 944.

APPENDIX E

COMPOUND: Trichloromelamine — USAEHA STUDY NO. 75-51-0195-84

PRIMARY SKIN EFFECTS
NEW ZEALAND WHITE
RABBITS

TOXICITY CATEGORY*
III

CONDITIONS - Wet paste Trichloromelamine - Single 24-hour application of 0.5 g compound in 0.5 ml water.

	Time of Observation Hours	Response Rabbit No. 1	2	3	4	5	6	Mean Score	Comments
Erythema & Eschar									
Intact Skin	24	1	2	2	1	1	3	1.67	Category III compounds are compounds producing moderate irritation.
Intact Skin	72	1	1	1	0	1	1	0.83	
Abraded Skin	24	0	2	1	2	1	1	1.16	
Abraded Skin	72	0	0	0	1	0	1	0.33	
						Subtotal		3.99	
Edema Formation									
Intact Skin	24	2	1	1	0	1	2	1.16	
Intact Skin	72	0	0	0	0	0	1	0.17	
Abraded Skin	24	0	1	1	1	1	1	0.83	
Abraded Skin	72	0	0	0	0	0	0	0.00	
						Subtotal		2.16	
						Total		6.15	

*40 CFR 162
Skin reactions are evaluated using Draize scoring systems. Draize, J.H., Woodward, G. and Calvary, H.O., Methods for the Study of Irritation of Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 777, 490, 944.

APPENDIX F

COMPOUND: Potassium Iodide — USAEHA STUDY NO. 75-51-0195-84

PRIMARY SKIN EFFECTS
NEW ZEALAND WHITE
RABBITS

TOXICITY CATEGORY *
IV

CONDITIONS - Dry
Potassium Iodide (KI) - Single 24-hour application of 0.5g dry white crystalline powder per skin application site.

	Time of Observation	Response Rabbit No.							
	Hours	1	2	3	4	5	6	Mean Score	Comments
Erythema & Eschar									
Intact Skin	24	2	0	1	0	1	0	0.67	Category IV compounds are compounds producing none, mild or slight irritation at 72 hours.
Intact Skin	72	0	0	1	0	0	0	0.17	
Abraded Skin	24	0	2	2	0	2	0	1.00	
Abraded Skin	72	0	0	0	0	0	0	0.00	
							Subtotal	1.84	
Edema Formation									
Intact Skin	24	1	0	0	0	0	0	0.17	
Intact Skin	72	0	0	0	0	0	0	0.00	
Abraded Skin	24	0	0	0	0	1	0	0.17	
Abraded Skin	72	1	0	0	0	0	0	0.17	
							Subtotal	0.51	
							Total	2.35	

* 40 CFR 162
Skin reactions are evaluated using Draize scoring systems. Draize, J.H., Woodward, G. and Calvary, H.O., Methods for the Study of Irritation of Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 777, 490, 944.

APPENDIX G

COMPOUND: Potassium Iodide								USAEHA STUDY NO. 75-51-0195-84
PRIMARY SKIN EFFECTS NEW ZEALAND WHITE RABBITS		TOXICITY CATEGORY * IV						CONDITIONS - Wet paste Potassium Iodide (KI) - Single 24-hour application of 0.5 g compound in 0.5 ml water.
	Time of Observation	Response Rabbit No.						
	Hours	1	2	3	4	5	6	Mean Score / Comments
Erythema & Eschar								
Intact Skin	24	0	0	0	0	0	1	0.17
Intact Skin	72	0	0	1	0	0	0	0.17
Abraded Skin	24	1	0	1	0	1	0	0.50
Abraded Skin	72	0	1	0	1	1	0	0.50
						Subtotal		1.34
Edema Formation								
Intact Skin	24	0	0	0	0	0	0	0.00
Intact Skin	72	0	0	0	0	0	0	0.00
Abraded Skin	24	0	0	0	0	0	0	0.00
Abraded Skin	72	0	1	0	1	0	0	0.33
						Subtotal		0.33
						Total		1.67

Comments: Category IV compounds are compounds producing none, mild or slight irritation at 72 hours.

* 40 CFR 162

Skin reactions are evaluated using Draize scoring systems. Draize, J.H., Woodward, G and Calvary, H.O., Methods for the Study of Irritation of Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 777, 490, 944.

APPENDIX H

COMPOUND: Aqueous (use) solution complete disinfectant mixture with KI — USAEHA STUDY NO. 75-51-0195-84

PRIMARY SKIN EFFECTS
NEW ZEALAND WHITE
RABBITS

TOXICITY CATEGORY*

IV

Condition - Wet
Disinfectant mixture - Single 24-hour application of 0.5 ml aqueous disinfectant solution. Dry disinfectant mixture diluted with water to "use" formulation (1.7 mg mixture ml water).

	Time of Observation	Response (Rabbit No.)							
	Hours	1	2	3	4	5	6	Mean Score	Comments
Erythema & Eschar									
Intact Skin	24	0	0	0	0	0	0	0.0	Category IV compounds are compounds producing none, mild or slight irritation at 72 hours.
Intact Skin	72	0	0	0	0	0	0	0.0	
Abraded Skin	24	0	0	0	0	0	0	0.0	
Abraded Skin	72	0	0	0	0	0	0	0.0	
							Subtotal	0.0	
Edema Formation									
Intact Skin	24	0	0	0	0	0	0	0.0	
Intact Skin	72	0	0	0	0	0	0	0.0	
Abraded Skin	24	0	0	0	0	0	0	0.0	
Abraded Skin	72	0	0	0	0	0	0	0.0	
							Subtotal	0.0	
							Total	0.0	

* 40 CFR 162

Skin reactions are evaluated using Draize scoring systems. Draize, J.H., Woodward, G and Calvary, H.O., Methods for the Study of Irritation of Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 777, 490, 944.

APPENDIX I

COMPOUND: Disinfectant mixture, complete with KI, Dry — USAEHA STUDY NO. 75-51-0195-84

PRIMARY SKIN EFFECTS
NEW ZEALAND WHITE
RABBITS

TOXICITY CATEGORY * II

CONDITIONS - Dry
Disinfectant mixture - Single 24-hour application of 0.5g brownish dry complete mixture per skin application site.

	Time of Observation	Response Rabbit No.							
	Hours	1	2	3	4	5	6	Mean Score	Comments
Erythema & Eschar									
Intact Skin	24	2	2	4	1	4	1	2.33	Category II compounds are compounds producing severy primary irritation of the intact skin and of the skin surrounding an abrasion and in addition producing necrosis and vesiculation at 72 hours.
Intact Skin	72	4	2	4	0	4	0	2.33	
Abraded Skin	24	3	4	4	4	3	4	3.67	
Abraded Skin	72	3	4	2	2	2	2	2.50	
						Subtotal		10.83	
Edema Formation									
Intact Skin	24	1	3	3	0	3	0	1.67	
Intact Skin	72	0	3	3	0	4	0	1.67	
Abraded Skin	24	3	2	2	2	2	2	2.17	
Abraded Skin	72	3	0	1	3	1	0	1.33	
						Subtotal		6.84	
						Total		17.67	

* 40 CFR 162.

Skin reactions are evaluated using Draize scoring systems. Draize, J.H., Woodward, G. and Calvary, H.O., Methods for the Study of Irritation of Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82:777, 490, 944.

APPENDIX J

COMPOUND: Disinfectant mixture, complete with KI — USAEHA STUDY NO. 75-51-0195-84

PRIMARY SKIN EFFECTS
NEW ZEALAND WHITE
RABBITS

TOXICITY CATEGORY *
II

CONDITIONS - Wet paste.
Disinfectant mixture - Single 24-hour application of 0.5g mixture in 0.5 ml water.

	Time of Observation	Response Rabbit No.							
	Hours	1	2	3	4	5	6	Mean Score	Comments
Erythema & Eschar									
Intact Skin	24	4	4	4	4	4	4	4.00	Category II compounds are compounds producing severe primary irritation of the intact skin and of the skin surrounding an abrasion and, in addition, producing necrosis and vesiculation.
Intact Skin	72	4	4	4	4	4	4	4.00	
Abraded Skin	24	2	3	4	3	4	4	3.33	
Abraded Skin	72	4	3	4	3	4	4	3.66	
						Subtotal		14.99	
Edema Formation									
Intact Skin	24	4	3	4	3	4	3	3.50	
Intact Skin	72	4	3	4	3	4	3	3.50	
Abraded Skin	24	3	4	3	3	2	4	3.50	
Abraded Skin	72	0	4	3	3	4	4	3.00	
						Subtotal		13.50	
						Total		28.49	

* 40 CFR 162

Skin reactions are evaluated using Draize scoring systems. Draize, J.H., Woodward, G. and Calvary, H.O., Methods for the Study of Irritation of Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 777, 490, 944.

APPENDIX K

COMPOUND: Package "A"[+] Formulation of Disinfectant — USAEHA STUDY NO. 75-51-0195-84

PRIMARY SKIN EFFECTS
NEW ZEALAND WHITE
RABBITS

TOXICITY CATEGORY *
IV

CONDITIONS - Dry
Package A - Single 24-hour application of 0.5g dry white powder per skin application site.

	Time of Observation	Response — Rabbit No.							
	Hours	1	2	3	4	5	6	Mean Score	Comments
Erythema & Eschar									
Intact Skin	24	0	0	0	0	0	0	0	
Intact Skin	72	0	0	0	0	0	0	0	
Abraded Skin	24	0	0	0	0	0	0	0	Category IV compounds are compounds producing none, mild or slight irritation at 72 hours.
Abraded Skin	72	2	1	0	0	0	0	0.50	
						Subtotal		0.50	
Edema Formation									
Intact Skin	24	0	0	0	0	0	0	0	
Intact Skin	72	0	0	0	0	0	0	0	
Abraded Skin	24	0	0	0	0	0	0	0	
Abraded Skin	72	2	0	0	0	0	0	0.33	
						Subtotal		0.33	
						Total		0.83	

* 40 CFR 162

Skin reactions are evaluated using Draize scoring systems. Draize, J.H., Woodward, G. and Calvary, H.O., Methods for the Study of Irritation of Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 777, 490, 944.

[+]Lot 0611-1, 10/75, Chemical Compounding Corp., Riverhead, L.I., N.Y.

APPENDIX L

COMPOUND: Package "A" Formulation of Disinfectant[+] — USAEHA STUDY NO. 75-51-0195-84

PRIMARY SKIN EFFECTS
NEW ZEALAND WHITE
RABBITS

TOXICITY CATEGORY*
II

CONDITIONS - Wet paste
Package A - Single 24-hour application of 0.5g powder mixed with 0.5 ml distilled water per skin application site

	Time of Observation	Response — Rabbit No.							
	Hours	13	14	15	16	17	18	Mean Score	Comments
Erythema & Eschar									
Intact Skin	24	0	2	0	2	1	1	1.0	Category II compounds are compounds producing moderate primary irritation of the intact skin and of the skin surrounding an abrasion at 72 hours
Intact Skin	72	2	2	2	2	2	2	2.0	
Abraded Skin	24	0	2	0	2	1	1	1.0	
Abraded Skin	72	2	2	2	2	2	2	2.0	
						Subtotal		6.0	
Edema Formation									
Intact Skin	24	0	2	0	2	1	1	1.0	
Intact Skin	72	1	0	1	1	0	0	0.5	
Abraded Skin	24	0	2	0	1	2	1	1.0	
Abraded Skin	72	1	2	1	1	2	1	1.3	
						Subtotal		3.8	
						Total		11.8	

*40 CFR 162

Skin reactions are evaluated using Draize scoring systems. Draize, J.H., Woodward, G and Calvary, H.O., Methods for the Study of Irritation of Toxicity of Substances Applied Topically to the Skin and Mucous Membranse, J. Pharmacol and Exp Therap., 82: 777, 490, 944.

[+]Lot 0611-1, 10/75, Chemical Compounding Corp., Riverhead, L.I., N.Y.

APPENDIX M

COMPOUND: Trichloromelamine								USAEHA STUDY NO. 75-51-0195-84
ACUTE EYE EFFECTS NEW ZEALAND WHITE RABBITS		TOXICITY CATEGORY* I						CONDITIONS - Unwashed eye test: Trichloromelamine - Single 24-hour application of 0.1 g dry white powder to one eye of each rabbit.
Time of Reading		Scores Rabbit No.							
Hrs-Days	Structure	1	2	3	4	5	6	Mean Score	Comments
24	Cornea	60	40	40	40	40	40	43.3	Category I compounds are compounds producing corrosive corneal opacity not reversible within 7 days.
	Iris	10	10	5	5	5	5	6.6	
	Conjunctivae	14	14	14	14	16	10	13.7	
48	Cornea	60	60	60	80	40	40	56.7	
	Iris	10	10	5	10	5	5	7.5	
	Conjunctivae	14	16	14	18	14	14	15.0	
72	Cornea	60	60	60	80	60	40	60.0	
	Iris	10	10	5	10	10	10	9.2	
	Conjunctivae	16	20	14	18	16	16	16.7	
7-Days	Cornea	80	80	60	80	80	80	76.7	
	Iris	20	10	10	20	20	20	16.7	
	Conjunctivae	24	24	14	24	24	24	22.3	
* 40 CFR 162									

The eye injury is evaluated according to a weighted scoring system used by Draize et.al. Draize, J.H., Woodward, G. and Calvary, H.O. Method for the Study of Irritation and Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 377-390, 1944.

APPENDIX N

COMPOUND: Trichloromelamine

USAEHA STUDY NO. 75-51-0195-84

ACUTE EYE EFFECTS
NEW ZEALAND WHITE
RABBITS

TOXICITY CATEGORY*
II

CONDITIONS - Washed eye test
Trichloromelamine - Single application of 0.1 g dry white powder to one eye of each rabbit. Eye washed out with distilled water for 1 minute 30 seconds after application.

Time of Peading Hrs-Days	Structure	Scores Rabbit No. 1	2	3	4	5	6	Mean Score	Comments
24	Cornea	0	10	0	0	0	0	1.7	Category II compounds are compounds producing mild injury to the cornea, reversible within 7 days.
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	18	18	20	20	16	14	17.7	
48	Cornea	0	0	0	0	0	0	0.0	
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	0	0	0	0	0	0	0.0	
72	Cornea	0	0	0	0	0	0	0.0	
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	0	0	0	0	0	0	0.0	
7-Days	Cornea	0	0	0	0	0	0	0.0	
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	0	0	0	0	0	0	0.0	

* 40 CFR 162

The eye injury is evaluated according to a weighted scoring system used by Draize et.al. Draize, J.H., Woodward, G. and Calvary, H.O. Method for the Study of Irritation and Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 377-390, 1944.

APPENDIX O

COMPOUND: Potassium Iodide								USAEHA STUDY NO. 75-51-0195-84
ACUTE EYE EFFECTS NEW ZEALAND WHITE RABBITS		TOXICITY CATEGORY* III						CONDITIONS - Unwashed Eye Test Potassium Iodide - Single 24-hour application of 0.1 g of dry white crystalline compound to one eye of each rabbit.
Time of Reading		Scores Rabbit No.						
Hrs-Days	Structure	1	2	3	4	5	6	Mean Score / Comments
24	Cornea	0	0	0	0	0	0	0.0
	Iris	0	0	0	0	0	0	0.0
	Conjunctivae	10	4	10	10	12	12	9.7
48	Cornea	0	0	0	0	0	0	0.0
	Iris	0	0	0	0	0	0	0.0
	Conjunctivae	10	0	10	12	4	6	5.3
72	Cornea	0	0	0	0	0	0	0.0
	Iris	0	0	0	0	0	0	0.0
	Conjunctivae	10	0	6	8	2	4	5.0
7-Days	Cornea	0	0	0	0	0	0	0.0
	Iris	0	0	0	0	0	0	0.0
	Conjunctivae	0	0	0	0	0	0	0.0

Comments: Category III compounds are compounds producing no corneal opacity; irritation reversible within 7 days.

* 40 CFR 162

The eye injury is evaluated according to a weighted scoring system used by Draize et.al. Draize, J.H., Woodward, G. and Calvary, H.O. Method for the Study of Irritation and Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 377-390, 1944.

APPENDIX P

COMPOUND: Potassium Iodide — USAEHA STUDY NO. 75-51-0195-84

ACUTE EYE EFFECTS
NEW ZEALAND WHITE RABBITS

TOXICITY CATEGORY*
II

CONDITIONS - Washed eye test
Potassium Iodide (KI) - Single application of 0.1 g dry white crystalline compound to one eye of each rabbit. Eye washed out with distilled water for 1 min. 30 secs. after application.

Time of Reading Hrs-Days	Structure	Scores Rabbit No. 1	2	3	4	5	6	Mean Score	Comments
24	Cornea	0	40	0	0	0	0	6.7	Category II compounds are compounds producing mild injury to the cornea; reversible within 7 days.
	Iris	0	10	0	0	0	0	1.7	
	Conjunctivae	6	18	12	11	6	14	11.2	
48	Cornea	0	0	0	0	0	0	0.0	
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	6	6	0	0	0	0	2.0	
72	Cornea	0	0	0	0	0	0	0.0	
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	2	2	0	0	0	0	0.7	
7-Days	Cornea	0	0	0	0	0	0	0.0	
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	0	0	0	0	0	0	0.0	

* 40 CFR 162

The eye injury is evaluated according to a weighted scoring system used by Draize et.al. Draize, J.H., Woodward, G. and Calvary, H.O. Method for the Study of Irritation and Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 377-390, 1944.

APPENDIX Q

COMPOUND: Complete disinfectant mixture with KI. USAEHA STUDY NO. 75-51-0195-84

ACUTE EYE EFFECTS NEW ZEALAND WHITE RABBITS

TOXICITY CATEGORY* IV

CONDITIONS - Unwashed eye test. Disinfectant mixture - Single application of 0.1 ml aqueous disinfectant solution to one eye of each rabbit. Dry disinfectant mixture diluted with water to "use" formulation (1.7 g mixture/ml water).

Time of Reading Hrs-Days	Structure	Scores Rabbit No. 1	2	3	4	5	6	Mean Score	Comments
24	Cornea	0	0	0	0	0	0	0.0	Category IV compounds are compounds producing no irritation to the eye.
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	0	0	0	0	0	0	0.0	
48	Cornea	0	0	0	0	0	0	0.0	
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	0	0	0	0	0	0	0.0	
72	Cornea	0	0	0	0	0	0	0.0	
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	0	0	0	0	0	0	0.0	
7-Days	Cornea	0	0	0	0	0	0	0.0	
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	0	0	0	0	0	0	0.0	

* 40 CFR 162

The eye injury is evaluated according to a weighted scoring system used by Draize et.al. Draize, J.H., Woodward, G. and Calvary, H.O. Method for the Study of Irritation and Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 377-390, 1944.

APPENDIX R

COMPOUND: Aqueous (use) solution complete disinfectant mixture with KI.		USAEHA STUDY NO. 75-51-0195-84
ACUTE EYE EFFECTS NEW ZEALAND WHITE RABBITS	TOXICITY CATEGORY* IV	CONDITIONS - Washed eye test. Disinfectant mixture - Single application of 0.1 ml aqueous disinfectant solution to one eye of each rabbit. Dry disinfectant mixture diluted with water to "use" formulation (1.7mg mixture/ml water).

Time of Reading Hrs-Days	Structure	Scores Rabbit No. 1	2	3	4	5	6	Mean Score	Comments
24	Cornea	0	0	0	0	0	0	0.0	Category IV compounds are compounds producing no irritation to the eye.
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	0	0	0	0	0	0	0.0	
48	Cornea	0	0	0	0	0	0	0.0	
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	0	0	0	0	0	0	0.0	
72	Cornea	0	0	0	0	0	0	0.0	
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	0	0	0	0	0	0	0.0	
7-Days	Cornea	0	0	0	0	0	0	0.0	
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	0	0	0	0	0	0	0.0	

* 40 CFR 162

The eye injury is evaluated according to a weighted scoring system used by Draize et.al. Draize, J.H., Woodward, G. and Calvary, H.O. Method for the Study of Irritation and Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 377-390, 1944.

APPENDIX S

COMPOUND: Disinfectant mixture, complete with KI, Dry								USAEHA STUDY NO. 75-51-0195-84
ACUTE EYE EFFECTS NEW ZEALAND WHITE RABBITS		TOXICITY CATEGORY* I						CONDITIONS - Unwashed eye test. Disinfectant mixture - Single 24-hour application of 0.1 g brownish dry, complete mixture to one eye of each rabbit.
Time of Reading Hrs-Days	Structure	Scores Rabbit No. 1	2	3	4	5	6	Mean Score	Comments
24	Cornea	60	60	60	60	60	60	60.0	Category I compounds are compounds producing corrosive corneal opacity not reversible within 7 days.
	Iris	10	10	10	10	10	10	10.0	
	Conjunctivae	16	14	16	16	14	16	15.3	
48	Cornea	60	40	60	60	60	60	56.7	
	Iris	10	5	10	10	5	5	7.6	
	Conjunctivae	16	10	14	16	16	16	14.7	
72	Cornea	60	20	40	60	60	60	50.0	
	Iris	10	5	5	10	5	5	6.7	
	Conjunctivae	18	14	12	16	10	6	12.7	
7-Days	Cornea	20	20	20	20	20	20	20.0	
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	6	6	6	6	6	6	6.0	

* 40 CFR 162

The eye injury is evaluated according to a weighted scoring system used by Draize et.al. Draize, J.H., Woodward, G. and Calvary, H.O. Method for the Study of Irritation and Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 377-390, 1944.

APPENDIX T

COMPOUND: Disinfectant mixture complete with KI, Dry

USAEHA STUDY NO. 75-51-0195-84

ACUTE EYE EFFECTS
NEW ZEALAND WHITE
RABBITS

TOXICITY CATEGORY*

II

CONDITIONS - Washed eye test
Disinfectant mixture - Single application of 0.1 g brownish, dry complete mixture to one eye of each rabbit. Eye washed out with distilled water for 1 minute 30 seconds after application.

Time of Reading Hrs-Days	Structure	Scores Rabbit No. 1	2	3	4	5	6	Mean Score	Comments
24	Cornea	0	40	60	60	30	45	39.1	Category II compounds are compounds that produce corneal opacity, reversible within 7 days.
	Iris	5	5	10	10	5	10	7.6	
	Conjunctivae	16	18	18	18	18	18	17.7	
48	Cornea	0	10	20	10	0	10	8.3	
	Iris	0	5	5	0	0	0	1.7	
	Conjunctivae	0	10	10	12	0	12	7.0	
72	Cornea	0	5	15	5	0	5	5.0	
	Iris	0	5	0	0	0	0	0.8	
	Conjunctivae	0	2	6	8	0	6	3.7	
7-Days	Cornea	0	0	0	0	0	0	0.0	
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	0	0	0	0	0	0	0.0	

* 40 CFR 162

The eye injury is evaluated according to a weighted scoring system used by Draize et.al. Draize, J.H., Woodward, G. and Calvary, H.O. Method for the Study of Irritation and Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 377-390, 1944.

APPENDIX U

COMPOUND: Package "A"**Formulation of Disinfectant		USAEHA STUDY NO. 75-51-0195-84
ACUTE EYE EFFECTS NEW ZEALAND WHITE RABBITS	TOXICITY CATEGORY* I	CONDITIONS - Unwashed eye test Package "A" - Single 24-hour application of 0.1g dry white powder to one eye of each rabbit.

Time of Reading Hrs-Days	Structure	Scores Rabbit No. 1	2	3	4	5	6	Mean Score	Comments
24	Cornea	20	0	80	80	0	30	35.0	Category I compounds are compounds producing severe injury to the cornea and conjunctiva. Corneal opacity persistent at 7 days.
	Iris	5	5	10	10	5	5	6.7	
	Conjunctivae	18	18	18	18	18	18	18.0	
48	Cornea	20	5	80	20	5	20	25.0	
	Iris	5	5	10	10	0	5	5.8	
	Conjunctivae	16	16	14	20	16	14	16.0	
72	Cornea	20	10	80	20	0	20	25.0	
	Iris	5	0	0	5	0	5	2.5	
	Conjunctivae	20	18	18	18	12	18	17.3	
7-Days	Cornea	5	5	60	5	0	5	13.3	
	Iris	5	0	0	0	0	0	0.8	
	Conjunctivae	16	16	14	16	8	18	14.7	

* 40 CFR 162

The eye injury is evaluated according to a weighted scoring system used by Draize et.al.
Draize, J.H., Woodward, G. and Calvary, H.O. Method for the Study of Irritation and Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 377-390, 1944.
Lot No. 0611-1, 10/75 Chemical Compounding Corp., Riverhead, L.I., N.Y.

APPENDIX V

COMPOUND: Package "A" Formulation of Disinfectant — USAEHA STUDY NO.75-51-0195-84

ACUTE EYE EFFECTS
NEW ZEALAND WHITE RABBITS

TOXICITY CATEGORY*
II

CONDITIONS - Washed eye test
Package "A" - Single application of 0.1g dry white powder to one eye of each rabbit. Eye washed out with distilled water for 1 minute 30 seconds after application.

Time of Reading Hrs-Days	Structure	Scores Rabbit No. 13	14	15	16	17	18	Mean Score	Comments
24	Cornea	5	0	10	10	0	0	4.2	Category II compounds are compounds producing moderate injury to the cornea and in addition, producing some injury to the conjunctiva. Corneal opacity reversible within 7 days, irritation persisting for 7 days.
	Iris	5	0	5	5	0	0	2.5	
	Conjunctivae	22	14	18	22	20	22	19.7	
48	Cornea	0	0	0	5	5	0	0.8	
	Iris	0	0	0	0	0	000	0.0	
	Conjunctivae	8	16	14	14	12	10	10.7	
72	Cornea	0	0	0	0	0	0	0.0	
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	10	4	14	8	2	12	8.3	
7-Days	Cornea	0	0	0	0	0	0	0.0	
	Iris	0	0	0	0	0	0	0.0	
	Conjunctivae	4	2	6	4	0	8	4.0	

* 40 CFR 162

The eye injury is evaluated according to a weighted scoring system used by Draize et.al. Draize, J.H., Woodward, G. and Calvary, H.O. Method for the Study of Irritation and Toxicity of Substances Applied Topically to the Skin and Mucous Membranes, J. Pharmacol and Exp Therap., 82: 377-390, 1944.

Lot No. 0611-1, 10/75

APPENDIX W

COMPOUND: Trichloromelamine — USAEHA STUDY NO. 75-51-0195-84

ACUTE ORAL LD_{50}
MALE RATS
SPRAGUE-DAWLEY, WISTAR

LD_{50}* 690 mg/kg — 95% C.L. 560 - 870 mg/kg

Slope 6.02 — S.E. 1.70

Conditions Administered in distilled water as 50% solutions 500 mg/ml

Dosage mg/kg	Conc %	Onset of signs (s), mortality (m): Hours 0-4	Hours 4-12	Hours 12-24	Days 2	Days 3	Days 4	Days 5	Days 6	Days 7	Days 8-14	Mort Cumulative	Mean Body Wt. Init	Mean Body Wt. Fin	Mean Body Wts. (g) Days 1	Days 3	Days 7	Days 14
501	50											0/6	201 ±17	255 ±26	201 ±7	204 ±14	241 ±15	255 ±26
631	50		S3	M3								3/6	207 ±16	264 ±20	204 ±8	206 ±4	244 ±5	264 ±20
795	50	S6	S6	M4								4/6	199 ±19	267 ±13	190 ±15	206 ±14	246 ±16	267 ±13
1000	50	M1	S6 M1	S6 M2								4/6	195 ±8	258 ±25	193 ±23	188 ±30	231 ±23	258 ±25
1269	50	M6										6/6	192 ±15	-	-	-	-	-
1585	50		S5	M5	M1							6/6	188 ±17	-	-	-	-	-
Control 1 ml/water												0/6	184 ±9	250 ±4	186 ±3	195 ±6	230 ±11	250 ±4

Signs of Intoxication Lethargy gasping were seen in 12 hours, signs at 24 hours following 1000 mg/kg lethargy ruffled pelt red exudate around eyes.
Gross Autopsy: No changes in decedents or survivors. No gross compound related changes seen at necropsy.

* Probit analysis by the method of Bliss.
40 CFR 162
Toxicity Category III

APPENDIX X

COMPOUND: Potassium Iodide (KI) USAEHA STUDY NO. 75-51-0195-84

ACUTE ORAL LD_{50}
MALE RATS
SPRAGUE-DAWLEY, WISTAR

LD_{50}* 4800 mg/kg 95% C.L. 4200 - 5500 mg/kg
Slope 15.0 S.E. 5.17
Conditions Administered in distilled water as 50% water solution (500 mg/kg/ 1 ml water)

Dosage mg/kg	Conc %	Onset of signs (s), mortality (m) Hours 0-4	Hours 4-12	Hours 12-24	Days 2	3	4	5	6	7	8-14	Mort Cumulative	Mean Body Wt. Init	Fin	Mean Body Wts. (g) Days 1	3	7	14
2510	50											0/6	185 ±7	245 ±14	182 ±5	-	198 ±8	245 ±14
3160	50											0/6	191 ±7	260 ±6	191 ±7	-	202 ±14	260 ±6
3980	50		S2	M1								1/6	196 ±8	282 ±18	187 ±13	-	180 ±21	282 ±18
5010	50		S2	M2	M1							3/6	201 ±6	244 ±14	180 ±13	-	214 ±20	244 ±14
6310	50	S6		M6								6/6	191 ±11	-	-	-	-	-
Control 1 ml water												0/6	192 ±6	277 ±9	201 ±6	-	250 ±8	277 ±9

Signs of intoxication: Major signs were ataxia and weakness and death over first 24 hours. No signs after 24 hours.
Gross Autopsy: No changes in decedents or survivors. No gross compound related changes seen at necropsy.

* Probit analysis by the method of Bliss.

40 CFR 162
Toxicity Category III

APPENDIX Y

COMPOUND: Disinfectant mixture

USAEHA STUDY NO. 75-51-0195-84

ACUTE ORAL LD_{50}
MALE RATS
SPRAGUE-DAWLEY, WISTAR

LD_{50} >22 mL/kg or 36 mg/kg per rat

95% C.L. _____

Slope _____

S.E. _____

Conditions Disinfectant mixture formulated 1.7 mg/ml
Dosages .005, .01, .02, .03 ml/gm body weight

Dosage ml/gm	Conc %	Onset of signs (s), mortality (m) Hours 0-4	Hours 4-12	Hours 12-24	Days 2	3	4	5	6	7	8-14	Mort Cumulative	Mean Body Wt. Init	Fin	Mean Body Wts. (g) Days 1	3	7	14
.005	.17											0/6	185 ±13	280 ±18	195 ±12	205 ±14	255 ±15	280 ±18
.01	.17											0/6	187 ±20	288 ±25	238 ±19	245 ±11	250 ±16	288 ±25
.02	.17											0/6	180 ±17	263 ±21	223 ±14	230 ± 9	240 ±11	263 ±21
.03	.17											0/6	191 ±14	271 ±17	231 ±21	250 ±17	250 ±18	271 ±17
Control .01 ml water/gm body wt.	.17											0/6	187 ±23	280 ±30	240 ±20	249 ±21	259 ±23	280 ±30

Signs of intoxication: No signs
Gross Autopsy: No changes in survivors. No gross compound related changes seen at necropsy.

40 CFR 162
Toxicity Category IV

APPENDIX Z

COMPOUND: Disinfectant mixture, complete with KI, wet — USAEHA STUDY NO. 75-51-0195-84

ACUTE OPAL LD_{50}
MALE RATS
SPRAGUE-DAWLEY, WISTAR

LD_{50}* 2400 mg/kg — 95% C.L. 2000 - 2800 mg/kg

Slope 7.56 — S.E. 2.04

Conditions Administered in distilled water as 50% water slurry (500 mg/ml)

Dosage mg/kg	Conc %	Onset of signs (s), mortality (m)										Mort Cumulative	Mean Body Wt.		Mean Body Wts. (g)			
		Hours			Days										Days			
		0-4	4-12	12-24	2	3	4	5	6	7	8-14		Init	Fin	1	7	12	14
1269	50		S6							M1		1/6	183 ±6	251 ±11	174 ±27	202 ± 8	245 ±11	251 ±11
1585	50		S6									0/6	189 ±11	232 ±18	179 ±13	196 ±14	228 ±18	232 ±18
2000	50		S6	S5	M1							1/6	198 ±10	215 ±24	166 ±25	182 ±23	212 ±21	215 ±24
2510	50		S6 M1	S2 M1								2/6	206 ±12	249 ±20	201 ±22	217 ±22	243 ±17	249 ±20
3160	50		S6 M3	S2 Md								6/6	205 ±8					
3980	50	M1	M5									6/6	212 ±8					
Control 1 ml water												0/6	177 ±8	254 ±10	199 ±9	216 ±9	250 ±8	254 ±10

Signs of intoxication: Lethargy gasping within 12 hours, red exudate around eyes at 24 hours.
Gross Autopsy: No changes in decedents or survivors. No gross compound related changes seen at necropsy.

*Probit analysis by the method of Bliss.
40 CFR 162
Toxicity Category III

APPENDIX AA

COMPOUND: Package "A"*** Formulation of Disinfectant — USAEHA STUDY NO. 75-51-0195-84

ACUTE ORAL LD_{50}
MALE RATS
SPRAGUE-DAWLEY, WISTAR

LD_{50}* 3000 mg/kg — 95% C.L. 2500-3600 mg/kg
Slope 7.23 — S.E. of Slope: 1.82
Conditions Administered in distilled water as 30% solutions (300 mg/ml)

Dosage	Conc %	Onset of signs (s), mortality (m) Hours 0-4	Hours 4-12	Hours 12-24	Days 2	Days 3	Days 4	Days 5	Days 6	Days 7	Days 8-14	Mort Cumulative	Mean Body Wt. Init	Mean Body Wt. Fin	Mean Body Wts. (g) Days 1	Days 3	Days 7	Days 14
1590	30					S1						0/6	183 ±6	265 ±7	193 ±4	196 ±4	215 ±14	265 ±7
2000	30					S2			M1			1/6	184 ±2	277 ±9	201 ±6	204 ±7	242 ±10	277 ±9
2510	30							M1	M2			3/6	184 ±2	266 ±9	184 ±6	187 ±8	233 ±12	266 ±9
3060	30											1/6	195 ±11	266 ±35	184 ±10	202 ±19	218 ±25	266 ±35
3980	30			M1	M4 S1							5/6	193 ±16	263 -	176 ±23	204 -	218 -	263 -
5010	30		S6	M4	M1	M1						6/6	187 ±7	- -	158 ±19	- -	- -	- -
6310	30	S6		M6								6/6	186 ±11	-	-	-	-	-
Control 1ml/water	-											0/6	184 ±7	264 ±12	199 ±8	205 ±8	221 ±12	264 ±12

Signs of intoxication: Convulsions, listlessness, shallow breathing, red discharge from nose, ataxia
Gross Autopsy; No changes in decedents or survivors. No gross compound related changes seen at necropsy.
*Probit analysis by the method of Bliss.

40 CFR 162 - Toxicity Category III
*** Lot 0611-1, 10/75, Chemical Compounding Corp., Riverhead, L.I., N.Y.

APPENDIX BB

COMPOUND: Trichloromelamine**

USAEHA STUDY NO. 75-51-0195-84

ACUTE DERMAL LD_{50}
MALE RABBITS
NEW ZEALAND WHITE

LD_{50}* 10.0 g/kg 95% C.L. 8.4 - 11.8 g/kg

Slope 1.34 S.E. 1.83

Conditions Administered as dry powder. Subject skin and test compound moistened with physiological saline prior to subject exposure

Dosage g/kg	Conc %	Onset of signs (s), mortality (m) Hours 0-4	Hours 4-12	Hours 12-24	Days 2	3	4	5	6	7	8-14	Mort Cumulative	Mean Body Wt. Init	Mean Body Wt. Fin	Mean Body Wts. (kg) Days 1	3	7	14
1.0											S1	0/4	3.73 ±.48	3.51 ±.36	3.68 ±.52	3.51 ±.39	3.49 ±.32	3.51 ±.36
3.2					S1	M1						1/4	3.60 ±.37	3.26 ±.65	3.45 ±.28	3.28 ±.43	3.29 ±.49	3.26 ±.65
10.0							S2				M2	2/4	3.95 ±.31	3.63 ±.18	3.73 ±.32	3.44 ±.24	3.27 ±.26	3.63 ±.18
Control Wrapped Only													3.80 ±.45	3.87 ±.39	3.78 ±.38	3.80 ±.39	3.83 ±.36	3.87 ±.39

Signs of intoxication: Nasal discharge, uncontrolled jerking movements, skin areas necrotic with edema, fast shallow breathing.

Gross autopsy: No changes in organs of decedents or survivors, skin application sites evidence of eschar.

* Probit analysis by the method of Bliss.

** Lot 409R Union Comp Corp., Wayne, N.J.

40 CFR 162 Toxicity Category III

APPENDIX CC

COMPOUND: Trichloromelamine — USAEHA PROJECT NO. 75-51-0195-84

ACUTE DERMAL LD_{50}
MALE RABBITS
NEW ZEALAND WHITE

LD_{50}* 2200 mg/kg — 95% C.L 1200-3900 mg/kg

Slope 4.24 — S.E. 1.94

Conditions Administered in distilled water at concentrations of 90 mg/mL

Dosage mg/kg	Conc %	Onset of signs (s), mortality (m) Hours 0-4	Hours 4-12	Hours 12-24	Days 2	3	4	5	6	7	8-14	Mort Cumulative	Mean Body Wt. Init	Fin	Mean Body Wts. (kg) Days 1	2	5	7	14
450	9											0/4	3.90 ±.16	3.35 ±.31	3.66 ±.24			3.50 ±.32	3.35 ±.31
900	9											0/4	3.81 ±.59	3.29 ±.53	3.68 ±.57			3.41 ±.47	3.24 ±.5?
1800	9				M1	M1						2/4	3.78 ±.16	3.18 ±.11	3.55 ±.09			3.23 ±.11	3.18 ±.11
3600	9				M1	M1				M1		3/4	3.54 ±.56	2.47 -	3.10 ±.62			2.68 ±.18	2.47 -
Control 1 ml water/ kg												0/4	2.64 ±.05	2.62 ±.14	2.44 ±.11	2.55 ±.09	2.75 ±.12	2.59 ±.19	2.62 ±.14

Signs of intoxication: Skin irritation at all dosage levels 24 hours after application progressing to severe primary irritation at 7 days.
Gross Autopsy: No changes in organs, skin application sites evidence of eschar.

* Probit analysis by the method Bliss.
40 CFR 162
Toxicity Category III

APPENDIX DD

COMPOUND: Package "B" Formulation of Disinfectant (K1) USAEHA STUDY NO. 75-51-0195-84

ACUTE DERMAL LD_{50}
MALE RABBITS
NEW ZEALAND WHITE

LD_{50}* 3.69 g/kg 95% C.L. 3.03 - 6.71 g/kg

Slope 10.97 S.E. 128

Conditions Administered as a dry powder. Subject skin and test compound moistened with physiological saline prior to subject exposure.

Dosage g/kg	Conc %	Onset of signs (s), mortality (m) Hours 0-4	Hours 4-12	Hours 12-24	Days 2	Days 3	Days 4	Days 5	Days 6	Days 7	Days 8-14	Mort Cumulative	Mean Body Wt. Init	Mean Body Wt. Fin	Mean Body Wts. (kg) Days 1	Days 3	Days 7	Days 14
1.0					S-1						M1	1/4	3.43 ±.22	3.58 ±.35	3.38 ±.17	3.43 ±.33	3.47 ±.32	3.58 ±.35
3.2					S-2						M1	1/4	3.63 ±.22	3.38 ±.08	3.48 ±.15	3.40 ±.22	3.35 ±.17	3.38 ±.08
10.0				M-1	S-3	M-1					M-2	4/4	3.35 ±.25		3.17 ±.18	3.05 ±.07	2.98 ±.11	
Control Wrapped Only												0/4	3.68 ±.21	3.81 ±.20	3.68 ±.21	3.69 ±.21	3.71 ±.23	3.81 ±.20

Signs of intoxication: Skin areas necrotic with edema.
Gross autopsy: One rabbit at 3.16 gm/kg dosage showed caseous white material in colon wall at junction of free particles of 1/16" diameter of caseous material in the urinary bladder. The urinary bladder was thickened and the left kidney was adhered to the pertoneum.

*Probit analysis by the method of Bliss
40 CFR 162 Toxicity Category III
Lot 0611-1, 10/75 Chemical Compounding Corp. Riverhead, L.I., N.Y.

APPENDIX EE

COMPOUND: Powdered Mixture of Pacakges "A" and "B" USAEHA STUDY NO. 75-51-1095-84

ACUTE DERMAL LD_{50}
MALE RABBITS
NEW ZEALAND WHITE

LD_{50}* 2.61 g/kg 95% C.L. 1.1 - 6.2 g/kg

Slope 7.6 S.E. 64

Conditions Administered as a wet paste. Subject skin and test compound moistened with physiological saline prior to subject exposure.

Dosage g/kg	Conc %	Onset of signs (s), mortality (m) Hours 0-4	Hours 4-12	Hours 12-24	Days 2	Days 3	Days 4	Days 5	Days 6	Days 7	Days 8-14	Mort Cumulative	Mean Body Wt. Init	Mean Body Wt. Fin	Mean Body Wts. (kg) Days 1	Days 3	Days 7	Days 14
10.0				2M S2	M2							4/4	3.05 ±.41	-	3.06 ±.53	-	-	-
3.2					S4	M3						3/4	2.80 ±.48	2.55 -	2.77 ±.46	2.50 -	2.50 -	2.55 -
1.0					S4	M1						1/4	2.93 ±.17	2.93 ±.11	2.81 ±.28	2.73 ±.15	2.78 ±.18	2.93 ±.11
0.32					S4							0/4	2.80 ±.15	2.56 ±.25	2.73 ±.13	2.55 ±.15	2.51 ±.25	2.56 ±.25
Control Wrapped Only												0/4	2.79 ±.27	-	2.86 ±.28	2.83 ±.28	2.83 ±.28	3.03 ±.24

Signs of Intoxication: Skin areas necrotic with edema.

Gross autopsy: Rabbits that died during test had fatty congested livers and large red infarcts of the kidneys. Rabbits that survived had fatty livers, or early cirrhotic changes (nodular hyperplasia) or normal livers. Kidneys from these rabbits were fatty or diffusely hemorrhagic with casts (blood) in the pelvis or normal kidneys.

40 CFR Toxicity Category III

* Probit analysis by the method of Bliss.

** Lot 0611-1, 10/75, Chemical Compounding Corp, Riverhead, L.I., N.Y.

APPENDIX FF

COMPOUND: Disinfectant mixture, complete with KI, wet USAEHA STUDY NO. 75-51-0195-84

ACUTE DERMAL LD_{50}
MALE RABBITS
NEW ZEALAND WHITE

LD_{50}* >31.6 ml/kg 95% C.L. _____

Slope _____ S.E. _____

Conditions Water slurry of complete disinfectant mixture at a concentration of 25 mg/ml.

Dosage ml/kg	Conc %	Onset of signs (s), mortality (m) Hours 0-4	Hours 4-12	Hours 12-24	Days 2	Days 3	Days 4	Days 5	Days 6	Days 7	Days 8-14	Mort Cumulative	Mean Body Wt. Init	Mean Body Wt. Fin	Mean Body Wts. (kg) Days 1	Days 2	Days 3	Days 6	Days 14
1.0	2.5											0/4	2.88 ±.30	3.11 ±.29	2.78 ±.38	2.83 ±.33	2.92 ±.26	2.88 ±.22	3.11 ±.29
3.16	2.5											0/4	3.13 ±.15	3.33 ±.15	3.13 ±.15	3.08 ±.15	3.14 ±.12	3.05 ±.20	3.33 ±.15
10.0	2.5											0/4	2.75 ±.24	2.99 ±.30	2.73 ±.26	2.13 ±.10	2.68 ±.28	2.73 ±.19	2.99 ±.30
31.6	2.5											0/4	2.75 ±.17	2.99 ±.21	2.70 ±.22	2.53 ±.19	2.58 ±.23	2.61 ±.17	2.99 ±.21
Control												0/4	2.75 ±.33	3.04 ±.23	2.60 ±.34	2.68 ±.29	2.74 ±.29	2.78 ±.29	3.04 ±.23

Signs of intoxication: Skin irritation was evident at all dosage levels 24 hours after application producing within seven days severe to primary irritation.
Gross Autopsy: Skin irritation at 14 days had progressed to eschar formation. No changes in organs and tissues at 14 days after exposure.

* Probit analysis Bliss, C.I. (1952) The Statistics of Bioassay, Vol II Academic Press, N.Y.
40 CFR 162
Toxicity Category IV

APPENDIX GG

COMPOUND: Package "A"** Formula of Disinfectant — USAEHA STUDY NO. 75-51-0195-84

ACUTE DERMAL LD_{50}
MALE RABBITS
NEW ZEALAND WHITE

LD_{50}* 2.65 g/kg — 95% C.L. 1.2 - 5.9 g/kg

Slope 8.24 — S.E. 127

Conditions Administered as wet paste. Subject skin and test compound moistened with physiological saline prior to subject exposure.

Dosage g/kg	Conc %	Onset of signs (s), mortality (m) Hours 0-4	Hours 4-12	Hours 12-24	Days 2	Days 3	Days 4	Days 5	Days 6	Days 7	Days 8-14	Mort Cumulative	Mean Body Wt. Init	Mean Body Wt. Fin	Mean Body Wts. (kg) Days 1	Days 3	Days 7	Days 14
1.0												0/4	3.43 ±.34	3.64 ±.36	3.33 ±.34	3.18 ±.36	3.18 ±.42	3.64 ±.36
3.2				M1 S2	M2							3/4	3.75 ±.31	3.90 ±.00	3.87 ±.12	3.80 ±.00	3.85 ±.00	3.90 ±.00
10.0				S4	M2 S2	S1			M1		M1	4/4	3.53 ±.24	- -	3.43 ±.17	3.60 -	3.40 -	- -
Control wrapped only												0/4	4.00 ±.50	4.35 ±.52	3.88 ±.60	4.04 ±.51	4.25 ±.51	4.35 ±.52

Signs of intoxication: Nasal discharge, skin areas necrotic with edema.
Gross autopsy: Two animals showed probable compound related changes at necropsy. One rabbit at 1 mg/kg had kidneys that were grossly pale and friable. The other animal at 3.2 mg/kg had free blood in the abdominal cavity with fibrin tags on the viscera but with no evidence of perforated viscera.

40 CFR 162 Toxicity Category III
*Probit analysis by the method of Bliss.
** Lot 0611-1, 10/75 Chemical Compounding Corp., Riverhead, L.I., N.Y.

APPENDIX HH

COMPOUND: Trichloromelamine **USAEHA STUDY NO.** 75-51--0195-84

GUINEA PIG SENSITIZATION
MALE
HARTLEY STRAIN

Substance: Trichloromelamine

Identity: Intradermal injection - Ten sensitizing doses of 0.1 ml of a 0.1% solution in saline
Positive Control - Dinitrochlorobenzene (DNCB)

	Mean Body Weight (g)		Diluent		Test Compound		
24 Hrs	Initial	Final	Initial	Final	Initial	Final	Comments
Test Cmpd	286 ±39	478 ±50	0	0	3	17	Test compound did not produce a sensitization reaction in guinea pigs.
Positive Control	330 ±40	518 ±41	0	0	37	262	
	Mean Body Weight (g)		Diluent		Test Compound		
48 Hrs	Initial	Final	Initial	Final	Initial	Final	DNCB positive control showed a sensitizing reaction in 10/10 guinea pigs.
Test Cmpd			0	0	0	0	
Positive Control			0	0	4	285	Final Scores
							> 100 strong sensitizing 25-100 mild sensitizing < 25 no sensitization

The Landsteiner Guinea Pig Sensitization Test.

APPENDIX II

COMPOUND: Complete disinfectant mixture with KI — **USAEHA STUDY NO. 75-51-0195-84**

GUINEA PIG SENSITIZATION
MALE
HARTLEY STRAIN

Substance: Disinfectant mixture, complete with KI
Positive Control: Dinitrochlorobenzene (DNCB)
Identity: Intradermal injection. Ten sensitizing doses of 0.1 ml of a 0.1% solution in saline. Mixture prepared each day of injection.

24 Hrs	Mean Body Weight (g) Initial	Final	Diluent Initial	Final	Test Compound Initial	Final	Comments
Test Cmpd	286 ±32	463 ±28	0	0	8	13	Test compound did not produce a sensitization reaction in guinea pigs.
Positive Control	292 ±29	449 ±37	0	0	19	313	

48 Hrs	Mean Body Weight (g) Initial	Final	Diluent Initial	Final	Test Compound Initial	Final	
Test Cmpd			0	0	0	6	DNCB positive control showed a sensitizing reaction in 10/10 guinea pigs.
Positive Control			0	0	9	221	Final Scores
							> 100 strong sensitizing 25-100 mild sensitizing < 25 no sensitization

The Landsteiner Guinea Pig Sensitization Test

APPENDIX JJ

COMPOUND: Package"A*" Formulation of Disinfectant — USAEHA STUDY NO. 75-51-0195-84

GUINEA PIG SENSITIZATION
MALE
HARTLEY STRAIN

Substance: Package "A"

Identity: Intradermal injection. Ten sensitizing doses of 0.1 ml of a 0.1% solution in saline.

Positive Control: Dinitrochlorobenzene (DNCB)

24 Hrs	Mean Body Weight (g) Initial	Final	Diluent Initial	Final	Test Compound Initial	Final	Comments
Test Cmpd	205 ± 36	399 ± 48	0.0	0.8	0.0	0.8	Test compound did not produce a sensitization reaction in guinea pigs.
Positive Control	241 ± 51	465 ± 107	0.8	0.0	22.0	421.0	

48 Hrs	Mean Body Weight (g) Initial	Final	Diluent Initial	Final	Test Compound Initial	Final	Comments
Test Cmpd	-	-	0	.8	0	0	DNCB positive control showed a sensitizing reaction in 9/10 guinea pigs.
Positive Control	-	-	0	0	12	198	Final Scores >100 strong sensitizing >25-100 mild sensitizing <25 no sensitization

The Landsteiner Guinea Pig Sensitization Test

* Lot No. 0611-1, 10/75

APPENDIX KK

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