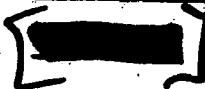


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Inhalation Approximate Lethal Concentration (ALC) of



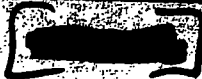
Haskell Laboratory Report No. 802-85



E. I. du Pont de Nemours and Company
Haskell Laboratory for Toxicology and Industrial Medicine
P. O. Box 50, Elkton Road
Newark, Delaware 19714

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Date Issued: January 6, 1986

Inhalation Approximate Lethal Concentration (ALC) ofSUMMARY

Groups of 6 male Cr1:CD¹(SD)BR rats were exposed to aerosol atmospheres of  for a single 4-hour period. Under the conditions of this test, the ALC for  was greater than 1800 mg/m³, the highest concentration that could be generated. This material is considered no worse than slightly toxic on an acute inhalation basis.

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LAK:smk:HLR17.17

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Haskell Laboratory Report No. 802-85

[REDACTED]
Haskell No. 15,636

Material Tested:

[REDACTED]

Sponsor:

Textile Fibers Department
E. I. du Pont de Nemours and Company
Wilmington, Delaware

Material Submitted By:

[REDACTED]
Textile Fibers Department
E. I. du Pont de Nemours and Company
Seaford, Delaware

Test Facility:

E. I. du Pont de Nemours and Company
Haskell Laboratory for Toxicology and
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Newark, Delaware 19714

Study Initiated - Completed:

12/7/84 - 12/26/84

[REDACTED]

There are 7 pages in this report.

Distribution:

[REDACTED]

INTRODUCTION

The purpose of this study was to determine a 4-hour inhalation ALC for [redacted] in male rats. The ALC was defined as the lowest atmospheric concentration tested that caused the death of 1 or more rats either on the day of exposure or within 14 days post exposure. Except as documented in the study records, this study was conducted according to the applicable Good Laboratory Practice Regulations. None of the deviations noted affected the validity of this study.

MATERIALS AND METHODS

A. Animal Husbandry

Young adult male CrI:CD®(SD)BR rats were received from Charles River Breeding Laboratories, Kingston, New York. Each rat was assigned a unique 6-digit identification number which corresponded to a numbered card affixed to the cage. Rats were quarantined for one week prior to testing, and were weighed and observed twice during the quarantine period. During the test, rats were housed in pairs in 8" x 14" x 8" suspended, stainless steel, wire-mesh cages. The rat assigned the lower number in each cage was identified by a slash in the right ear. Prior to exposure, rats' tails and cage cards were color-coded with water-insoluble markers so that individual rats could be identified after exposure. Except during exposure, Purina Certified Rodent Chow® #5002 and water were available ad libitum.

B. Exposure Protocol

Groups of 6 rats, 8 weeks old and weighing between 227 and 293 grams, were restrained in perforated, stainless steel cylinders with conical nose pieces. Each group was exposed nose-only for a single, 4-hour period to an aerosol atmosphere of [redacted] in air. Rats were weighed prior to exposure, and were observed for clinical signs of toxicity during exposure. For 2 exposures, surviving rats were weighed and observed daily for 14 days post exposure, weekends and holidays excluded except when warranted by the rats' condition. For 2 exposures, rats were weighed and observed on the 15th or 16th day of recovery because the 14th day fell on a holiday.

C. Test Material

Physical Form: Tan liquid

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Purity: [REDACTED]

Composition: [REDACTED]

Contaminants: [REDACTED]

Synonyms: [REDACTED]

Stability: The test material was assumed to be stable throughout the exposure phase of the test.

D. Atmosphere Generation

Aerosol atmospheres of [REDACTED] were generated by pumping the liquid test material to a Spraying Systems nebulizer. Air introduced at the nebulizer aerosolized the test material and swept the aerosol stream into the 38-liter glass exposure chamber. The atmospheric concentration of [REDACTED] was controlled by varying the liquid and air flow rates. The chamber exhaust was drawn through a cold trap and a MSA cartridge filter prior to being discharged into the hood.

E. Analytical

The atmospheric concentration of [REDACTED] was determined at approximately 30-minute intervals during each exposure by gravimetric analysis. Calibrated volumes of chamber atmosphere were drawn from the rats' breathing zone through preweighed Gelman® glass fiber filters. Filters were dried overnight in a desiccator containing Drierite® to remove residual water from the sample. Filters were weighed on a Cahn Model 26 Automatic Electrobalance®. The atmospheric concentration of [REDACTED] polymer was calculated from the difference between the pre- and post-sampling weights of the dried filters.

Particle size (mass median aerodynamic diameter and percent respirable) was determined with a Sierra Series 210 cascade impactor during each exposure. During each exposure, chamber temperature was measured with a mercury thermometer and relative humidity was measured with a Bendix Model 566 psychrometer. During most exposures, chamber oxygen content was measured with a BioMarine® Model 225 oxygen analyzer.

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F. Records Retention

All raw data and the final report will be stored in the archives of Haskell Laboratory for Toxicology and Industrial Medicine, Newark, Delaware, or in the Du Pont Hall of Records, E. I. du Pont de Nemours and Company, Wilmington, Delaware.

RESULTS

A. Exposure Conditions and Associated Mortality

During exposure, chamber temperature ranged between 21-22°C, relative humidity ranged from 28-69%, and chamber oxygen content was 21%. Atmospheric characterization and associated rat mortality data are summarized below.

Characterization of [REDACTED] Atmospheres and Associated Rat Mortality

Particulate ^a Concentration (mg/m ³)			% Respirable ^b	MMD(um) ^c	Mortality (# deaths/# exposed)
Mean	S.D.	Range			
17	17	0 - 40	>99	2.0	0/6
350	100	250 - 550	96	2.4	0/6
710	64	620 - 790	95	2.2	0/6
1800	150	1600 - 2000	81	4.4	0/6

^a Represents the concentrations of active ingredient only (water excluded).
^b Percent by weight of particles with aerodynamic diameter less than 10 um.
^c Mass median aerodynamic diameter.

No additional exposures to higher concentrations were attempted because the 1800 mg/m³ exposure concentration approached the limits of the generation system.

B. Clinical Observations

Under the conditions of this study, no rats died following exposure to [REDACTED]. During or immediately following exposure, rats in all

groups had a red nasal discharge. At concentrations greater than 17 mg/m³, rats' faces were stained with the test material. In addition, rats exposed to 350 mg/m³ had a diminished startle response during exposure.

During the postexposure period, rats exposed to 17, 350 or 710 mg/m³ had slight weight loss (average less than 5% of initial body weight) 1 day after exposure, followed by normal weight gain. Rats exposed to 1800 mg/m³ lost an average of 10% of initial body weight 1 day after exposure, and 2 rats continued to lose weight for 1 more day. No adverse clinical signs were observed in rats exposed to 17, 350 or 710 mg/m³. At 1800 mg/m³, some rats had faces stained by the test material, hair loss from the body, dry red nasal discharge, brown stained perineum and ruffled fur at various times during the first 9 days after exposure.

CONCLUSION

Under the conditions of this study, the ALC for [REDACTED] was greater than 1800 mg/m³, the highest concentration that could be generated. This material is considered no worse than slightly toxic on an acute inhalation basis (ALC between 800 and 2000 mg/m³).

¹ Calculation described in Sierra Instruments, Inc., Bulletin 7-79-219IM, Instruction Manual: Series 210 Ambient Cascade Impactors and Cyclone Preseparators.