AR226-2928

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Approximate Lethal Concentration

by Inhalation (ALC) of

[redacted]

Haskell Laboratory Report No. 279-85 [redacted]

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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Approximate Lethal Concentration by Inhalation (ALC) of [redacted]

Summary

Groups of 6 male Crl:CD®(SD)BR rats were exposed to aerosol atmospheres of [redacted] for a single, 4-hour period. Under the conditions of this test, the ALC for [redacted] was greater than 1200 mg/m^3, the highest concentration that could be generated. This material is considered no worse than slightly toxic by inhalation.

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LAK:HLR9.7

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Haskell Laboratory Report No. 279-85

[redacted] Haskell No. 15,590

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
Kingston, North Carolina

Test Facility: E. I. du Pont de Nemours and Company
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Study Initiated/Completed: 10/18/84 - 11/7/84

[redacted]
There are 7 pages in this report.

Distribution: [redacted]

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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.

MATERIALS AND METHODS

A. Animal Husbandry

Young adult male Crl: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. 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 237 and 268 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 [redacted] in air. Rats were weighed prior to exposure, and were observed for clinical signs during exposure. Surviving rats were weighed and observed daily for 14 days post exposure, weekends and holidays excluded except when deemed necessary by the rats' condition.

C. Test Material

Physical Form: Liquid
Purity: [redacted]
Composition: [redacted]

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Synonyms: [redacted]

CAS Registry No.:

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

D. Atmosphere Generation

Aerosol atmospheres of [redacted] were generated by pumping liquid test material into a Spraying Systems nebulizer. Air introduced at the nebulizer aerosolized the test material, and swept the aerosol stream through a cyclone elutriator. The cyclone removed large particles by inertial impaction, while aerodynamic particles passed through the cyclone and into the exposure chamber. After one exposure, the cyclone was removed in an effort to generate higher atmospheric concentrations.

E. Analytical

The atmospheric concentration of [redacted] was determined at approximately 30-minute intervals by drawing calibrated volumes of chamber atmosphere through preweighed, glass fiber filters. Filters were dried overnight in a desiccator containing Drierite® to remove any residual water from the filters. Filters were weighed on a Cahn model 28 Automatic Electrobalance®. The atmospheric concentration of particulate was calculated from the dried filter weight differential before and after sampling.

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

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 DuPont Hall of Records, E. I. du Pont de Nemours and Company, Wilmington, Delaware.

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RESULTS

A. Exposure Conditions and Associated Mortality

A mist was visible in the chamber during each exposure. Chamber temperature ranged between 16-23°C, relative humidity ranged from 51-86%, and chamber oxygen content was 21%. Atmospheric characterization and mortality data are summarized below.

Characterization of [redacted] Atmospheres and Associated Rat Mortality

Particulate[a] Concentration (mg/m^3) Mean	S.D.	Range	% Respirable[b]	MMD(um)[c]	Mortality (# deaths/# exposed)
27	17	0 - 58	96	1.2	0/6
650	210	300 - 1000	94	2.0	0/6
1200	180	1000 - 1500	96	2.0	0/6

[a] Represents the concentration of the active ingredient only (excluding water).
[b] Percent by weight of particles with aerodynamic diameter less than 10 um.
[c] Mass median aerodynamic diameter.

One additional exposure was attempted but not completed because a higher concentration could not be generated.

B. Clinical Observations

During or immediately following exposure, rats in all groups had red facial discharges, wet perineum and diarrhea. Rats exposed to 650 mg/m^3 and rats exposed to 1200 mg/m^3 had no startle response when the chamber was tapped and had faces stained by the test material. At 1200 mg/m^3, rats were gasping, lethargic, and limp.

During the postexposure period, rats exposed to 27 mg/m^3 and rats exposed to 650 mg/m^3 had minimal weight loss (0-3%) one day after exposure. At 1200 mg/m^3, most rats lost approximately 15% of initial body weight one day after exposure, and 1 rat continued to lose weight for 1 more day. No adverse clinical signs were observed in rats exposed to 27 mg/m^3. Rats exposed to 650 mg/m^3 and rats exposed to 1200 mg/m^3 had lung noise lasting up to 2 days post exposure, and hair loss from the head and nose from the 5th to 14th day post exposure. At 650 mg/m^3, 1

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rat had red ocular discharge for 2 days after exposure, and 1 rat had brown nasal discharge during the second week post exposure. At 1200 mg/m^3, additional clinical signs included gasping, diarrhea, wet or stained perineum, dry red nasal discharge, and stained or discolored fur. The majority of these signs were observed 1-2 days post exposure.

CONCLUSION

No rats died following exposure to 1200 mg/m^3 of [redacted]. Under the conditions of this study, the ALC for [redacted] was greater than 1200 mg/m^3. This material is considered no worse than slightly toxic by inhalation (ALC between 800 and 2000 mg/m^3).

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

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