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January 23, 1996

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ATTN: Section 8(e) Coordinator
Office of Toxic Substances
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

Dear Sir:

Bayer Corporation is submitting the final report (Report # 24531) as a follow-up to the one-page summary submitted on August 31, 1995 of an acute inhalation toxicity study of 2-Chloroacrylonitrile (CAS# 920-37-6).

Please contact me if you have any questions.

Sincerely,

Donald W. Lamb

Donald W. Lamb, Ph.D
Vice President
Product Safety & Regulatory Affairs
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DEPARTMENT OF TOXICOLOGY
FRIEDRICH-EBERT-STR. 217-333
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Report-No.: 24531

Date: 28.11.1995

2-CHLORACRYLNITRIL

STUDY ON ACUTE INHALATION TOXICITY IN RATS ACCORDING TO OECD No. 403

by

Dr. J. Pauluhn

Study No.: T9059294

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GOOD LABORATORY PRACTICE COMPLIANCE STATEMENT

This study conforms to the OECD Principles of Good Laboratory Practice (GLP) and to the Principles of Good Laboratory Practice (GLP) according to Appendix 1 ChemG (Bundesgesetzblatt [federal laws gazette] Part I, July 29, 1994).

Dr. J. Pauluhn D.A.B.T.
Board Approved Toxicologist (DGPT)
Study Director

Date: Jan Sep 10, 95

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2. QUALITY ASSURANCE STATEMENT

Test Substance: **2-CHLORACRYLNITRIL**

Study No.: **T9059294**

The study was audited by Quality Assurance on the dates given below. Audit reports have been submitted in writing to the study director and, if necessary, also the laboratory management, or other persons affected.

Date of audit	Date of report to study director/management
May 15, 1995 (study plan)	May 22, 1995
May 15, 1995	May 15, 1995
Jun. 06, 1995	Jun. 06, 1995
Jun. 27, 1995	Jun. 27, 1995

To the best of my knowledge, the results of the study and the methods used have been correctly reported.

Quality Assurance Unit
PH-QA-C/GLP, Bayer AG

Date: Nov. 22, 1995

Responsible: Dr.R.Rauchschwalbe

3. SIGNATURES

Study Director: _____ Date: 18. 7. 1995
Dr. J. Pauluhn

Analytical Cemistry: _____ Date: 18. 7. 1995
Dr. W. Rüngeler

Institute Head: _____ Date: 25. 7. 95
Prof. E. Löser

4. SUMMARY

A study on the acute inhalation toxicity of 2-CHLORACRYLNITRIL (hereafter referred to as *test substance)* in rats has been conducted in accordance with OECD Guideline No. 403. Groups of rats were exposed to average vapour concentration of 62, 87, 128, 201, and 396 mg/m³ air. The results can be summarized as follows:

LC_{50} inhalation (vapour, 4 hr)	NO(A)EL
Males & females combined: 102 mg/m³ air[1]	Males & Females: < 62 mg/m³ air[1]
Confidence interval (95%): 87 - 121 mg/m³	

Observations and Measurements

Vapour concentrations up to and including 62 mg/m³ did not induce test substance related mortality. Exposure to 87 mg/m³ air and above was followed by mortality occurring within post exposure days 1 through 5. Marked gender specific differences in susceptibility could not be observed. Exposures to concentrations of 62 mg/m³ and above were followed by a concentration-dependent bradypnoea, dyspnoea, laboured breathing pattern, rales, snout area with red encrustations, cyanosis, prostration (lying on belly), reduced motility, ungroomed haircoat, hypothermia, decrease in body weights, and piloerection. The duration of signs (maximum duration up to day 9) and, in most instances, was dependent on respiratory signs. Gross necropsy revealed distended, dark-red lungs. Clinical observations and necropsy findings support the conclusion that a causal relationship between lethality and lung damage existed.

Evaluation and Assessment

The evaporated test substance proved to have a high acute inhalation toxicity to rats. Cumulative evidence suggest that there is a causal relationship of local effects to the respiratory tract and the observed findings. The ratio of saturation vapour concentration (@ ca. 20 °C) and LC_{50}-value appears to be greater than 2000. Accordingly, the hazard potential of 2-CHLORACRYLNITRIL is considered to be high.

[1] All concentration data represent actual concentrations of the test substance in the rats' breathing zone.

5. INTRODUCTION

This acute inhalation toxicity study was conducted in accordance with OECD Guideline No. 403 using 2-CHLORACRYLNITRIL as a test substance. The study was performed on rats (nose-only exposure over 4 hours to the vapour phase of the test substance, dynamic exposure conditions, 2 week observation period). This study served the purpose of product classification and to estimate the potential acute health hazard resulting from handling this product.

The study was conducted at the test facility of the Institute of Toxicology, Department of Toxicology, Bayer AG, D-42096 Wuppertal, Germany.

Study No.: T9059294

Study period: May 15, 1995 - June 27, 1995

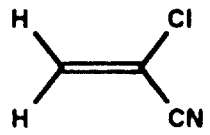
6. RESPONSIBILITIES

Head of Department: ..... Prof. Dr. E. Löser
Study Director and Report Author: ..... Dr. J. Pauluhn
Characterization of atmospheres: ..... Dr. W.Rüngeler
Biometric evaluation: ..... Dr. J. Pauluhn
Koordination of test substance delivery: ..... Dr. Paetz
Test substance / supply of analytical data: ..... Dr.Seelemann
Central Animal Supply Department: ..... Dr. K. Hoffmann
Air conditioning/air make-up ..... Dipl. Ing. G. Strietholt
Archiving the study data: ..... Prof. G. Schlüter
Quality Assurance: ..... Dr. H. Lehn
Gross pathology: ..... Dr. Rosenbruch

7. MATERIALS AND METHODS

7.1. Test Substance

Test substance:	2-CHLORACRYLNITRIL
Batch:	A 005 / Sample no.: 828084/1995
Purity:	99.1 % (see Appendix)
Producer:	Bayer AG, Leverkusen, Germany
Stability:	guaranteed for the duration of this study
Appearance:	translucent liquid
Storage:	Room temperature / darkness
Chemical name:	2-Chloracrylnitril
CAS-no.:	920-37-06
Molecular weight:	87.5 g/mol
Empirical formula:	C_3H_2ClN
Molecular formular:	



7.2. Test System and Housing of Animals

Species and species justification: The study was carried out in rats, a rodent species recommended in the test guidelines.

Healthy young adult SPF bred Wistar rats, strain Hsd Win:WU [formerly BOR: WISW (SPF-Cpb)], from the experimental animal breeder Harlan-Winkelmann, Borchen, Germany, were used. Animals of this strain have been used at Bayer AG in toxicological studies for years. Historical data on their physiology, diseases and spontaneous alterations are available. The state of health of the strain is randomly checked regularly at the instance of the Central Animal Supply Department, Bayer AG, for the most important specific infectious pathogens. The results of these examinations are archived.

Acclimatization: The animals were acclimatized to the animal room conditions for at least 5 days before use.

Identification: Animals were identified by both individual color-marking and cage-labels. All animals from this study were located on one cage-rack.

Randomization: Before the start of the study the health status of each animal was assessed. Animals were subsequently assigned to exposure groups at random (randomization procedure is described in section 7.16).

Health status: Only healthy rats free of signs were used for this study. The animals were not vaccinated or treated with anti-infective agents either before their arrival or during the acclimatization or study periods. The females were nulliparous and not pregnant.

Age and weight: At the study start the variation of individual weights did not exceed ± 10 per cent of the mean for each sex (see Appendix). Animals of the weight class used are 2 - 3 months old and hence fulfill the criterion for young adults.

Animal housing: During the acclimatization and study periods the animals were housed singly in conventional Makrolon® Type II cages (based on A. Spiegel and R. Gönnert, Zschr. Versuchstierkunde, 1, 38 (1961) and G. Meister, Zschr. Versuchstierkunde, 7, 144-153 (1965)). Cages and water bottles were changed twice a week while unconsumed feed was changed once per week. The legal requirements for housing experimental animals (86/609 EEC) were followed.

Bedding: Bedding consisted of type S 8/15 low-dust wood granulate from Ssniff, Soest/Westfalen, Germany. The wood granulate was randomly checked for harmful constituents at the request of the Central Animal Supply Department, Bayer AG.

Animal rooms: All animals were housed in a single room. For reasons of space availability rats from other acute toxicity studies were housed in the same room, however mistakes in animal assignments were excluded by adequate spatial separation, clear cage labeling, and appropriate organization of all work procedures. The housing of several studies in one animal room is not considered to be a deviation from current GLP-requirements since many acute studies comprise of 10 animals only (as required to perform a limit test).

Environmental Conditions in the Animal Room

The animal room environment was as follows:

Room temperature:	22 ± 2 °C
Relative humidity:	approximately 50 %
Dark/light cycle:	12 h/12 h; artificial light from 6.00 a.m. to 6.00 p.m. Central European Time
Light intensity:	approximately 14 watt/m² floor area
Ventilation:	approximately 10 air changes per hour

The room humidity and temperature were continuously monitored and documented using a calibrated thermohygrograph. Occasional deviations from these conditions occurred, e.g. as a result of animal room cleaning, but these had no detectable influence on the outcome of this study.

Cleaning, disinfection, and pest control: The animal room was regularly cleaned and disinfected once a week with an aqueous solution of Zephirol®. Contamination of the feed and contact with the test system were excluded. Pest control was not conducted in the animal room.

Feeding: Ration consisted of a standard fixed-formula diet (Altromin® 1324 pellets maintenance diet for rats and mice, Altromin GmbH, Lage) and tap water (drinking bottles). Both food and water were available *ad libitum*. The pelletized feed was contained in a rack in the stainless-steel wire cage cover. The nutritive composition and contaminant content of the standard diet was checked regularly by random sampling by the Central Animal Supply

Department, Bayer AG. Details concerning general feed and water specifications are provided in the Appendix.

Water: Drinking quality tap-water (Drinking Water Decree of 05.12.1990, Bundesgesetzblatt [federal law gazette] part I, page 2612) was provided *ad libitum* in polycarbonate bottles containing approximately 300 ml (based on A. Spiegel and R. Gönnert, Zschr. Versuchstierkunde, 1, 38 (1961) and G. Meister, Zschr. Versuchstierkunde, 7, 144-153 (1965)). The results of feed and water analyses are retained by Bayer AG. The available data provided no evidence of an impact on the study objective.

7.3. Test Guidelines

The study described below was carried out in accordance with OECD Guideline No. 403. The study conditions were adjusted so as to fulfill both the EC Guideline 92/69/EEC and the TSCA § 798.1150 (1989) guideline. Other recommendations (US EPA, 1988) were also considered so as to comply with internationally recognized procedures.

7.4. Exposure Conditions

Mode of exposure: Animals were exposed to the evaporated test substance in Plexiglas exposure tubes applying a *directed-flow* nose-only exposure principle. Tubes were chosen that accommodated the animals size. These tubes were designed so that the rat's tail remained outside the tube, thus restrained-induced hyperthermia can be avoided. This type of exposure is preferable to whole-body exposure on scientific (Pauluhn, 1984) and technical reasons (rapid attainment of steady-state concentrations, no problems with regard to test atmosphere inhomogeneities, better capabilities to control all inhalation chamber parameters, easier cleaning of exhaust air, and lower consumption of test substance). Moreover, contamination of the fur can largely be avoided. The chambers used are commercially available (TSE, 61348 Bad Homburg) and the performance of this type of chamber has been published (Pauluhn, 1984; Pauluhn, 1988; Pauluhn, 1994).

Vehicle: The test substance was aerosolized as vapour without a carrier or vehicle

7.5. Generation of Atmosphere and Exposure Technique

Vapour generation: Under dynamic conditions the test substance was fed into the intake of the cylindrical inhalation chamber so as shown in figure 1. Dry nitrogen (6 to 25 ml/min) from a pressurised cylinder was metered through liquid test substance (ca. 10 ml) contained in a glass bubbler (diameter: 1.5 cm, hight of liquid level: ca. 5 cm) using a TELAB PTFE pump {TELAB Labor & Technik, Gesellschaft für Meßtechnik mbH, Duisburg, Germany} and was subsequently diluted with conditioned dry air (15 l/min). The glass bubbler containing the test compound was maintained at 20 °C using a thermostat (JULABO UC, Julabo, Seelbach, Germany). The test atmosphere was then forced through openings in the inner concentric cylinder of the chamber, directly towards the rats' breathing zone. This arrangement minimises re-breathing of exhaled test atmosphere and prevents degradation of test compound. The stability of the test atmosphere was monitored continuously using a total hydrocarbon analyser equipped with a flame ionization detector (Ratfisch, Munic, Germany).

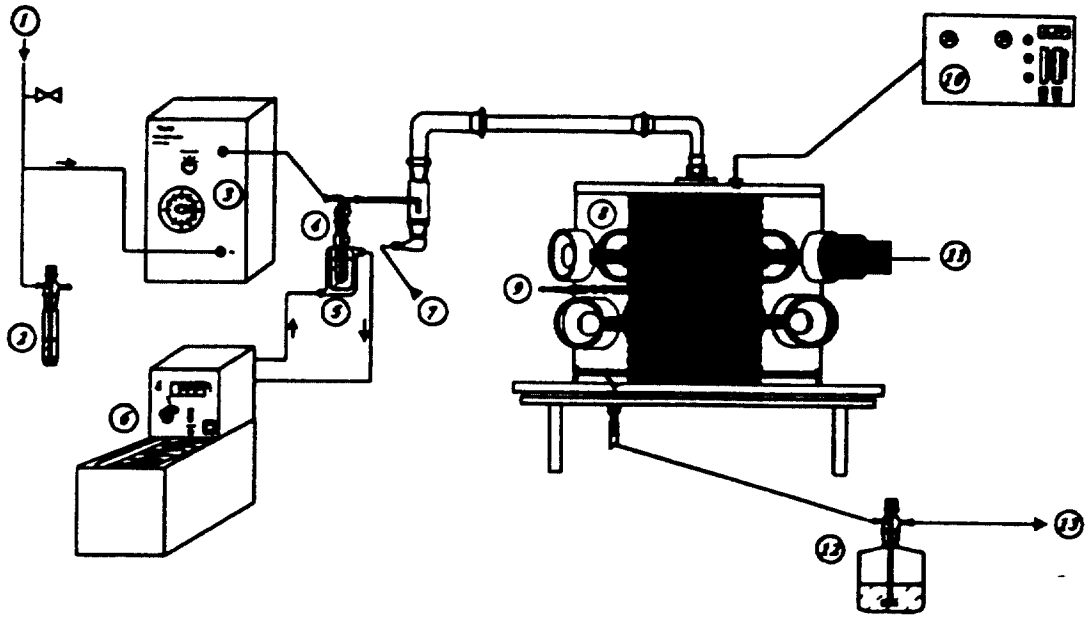
All metering devices, flow meters, and sensors were calibrated and/or checked for proper performance prior to the study.

Inhalation Chamber: The aluminum inhalation chamber has the following dimensions: inner diameter = 14 cm, outer diameter = 35 cm (two-chamber system), height = 25 cm (internal volume = about 3.8 l). The construction of the inhalation chamber is shown schematically in Fig. 1. Details of this modular chamber and its validation with regard to spatial homogeneity of material distribution have been published (Pauluhn, 1994).

Conditioning the compressed air: Compressed air was supplied by Boge compressors and was conditioned (i.e. freed from water, dust, and oil) automatically by a VIA compressed air dryer. Adequate control devices were employed to control supply pressure.

Inhalation chamber steady-state concentration: The test atmosphere generation conditions provide an adequate number of air exchanges per hour (> 400 x, continuous generation of test atmosphere). Under such test conditions steady state is attained within the first minute of exposure ($t_{99\%}$ = 4.6 x chamber volume/flow rate; McFarland, 1976). The ratio between the air supplied and exhausted was chosen so that approximately 85% of the supplied air is removed as exhaust. The remainder provides adequate dead-space ventilation for the exposure tubes. At each exposure port a minimal air flow rate of 1.4 l/min was provided. This is equivalent to approximately 4 respiratory minute volumes of the rats. The test atmosphere can by no means be diluted by bias-air-flows. The inhalation chamber was operated in a well ventilated chemical fume hood.

Fig. 1: Inhalation Chamber



1. Compressed air supply	9. Sampling location ('breathing zone sampling')
2. Excess N_2-outlet using a confining liquid (seal)	10. Real-time monitoring (THC)
3. Gas metering device in by-pass	11. Sensor for temperature and humidity measurement
4. Test substance in glass bubbler	12. Make-up of exhaust air (glass bubbler containing 10% aqueous NaOH solution)
5. Water jacket connected to thermostate	13. Exhaust air
7. Main stream air	
8. Exposure zone	

Air flows: During the exposure period air flows were monitored continuously and, if necessary, readjusted to the conditions required. Air flows were measured with calibrated flowmeters and/or soap bubble meter (Gilibrator, Ströhlein Instruments, Kaarst) and were checked for correct performance at regular intervals.

Treatment of exhaust air: The exhaust air was purified via glass bubbler containing 10% aqueous NaOH solution.

7.6. Inhalation Chamber Temperature and Humidity

The temperature and humidity measurements were made using a computerized system (Leybold Heraeus). The values were recorded at intervals of 10 min. Details of this monitoring system have been reported elsewhere (Pauluhn, 1986).

The relative humidity was measured with a humidity sensor (CCH capacitor). The humidity-sensor is protected from particles by a double sintered metal filter with an interposed Teflon membrane (pore size approximately 1 µm). This sensor was calibrated using saturated salt solutions according to Greenspan (1977). The temperature sensors were calibrated with a calibration thermometer. The measured values were recorded and evaluated with an Apple 2e computer and an MDP 8240/45 analogue-digital converter using an IEEE 488 interface.

7.7. Analysis of the Test Atmosphere

A nominal concentration was calculated taking into account the actually evaporated mass of test substance (difference of weight of the glass bubbler before and after each exposure) devided by total airflow through the chamber.

Chamber samples were taken in the vicinity of the breathing zone (see Fig. 1). The number of samples taken was sufficient to characterize the test atmosphere and was adjusted so as to accommodate the sampling duration and/or the need to confirm specific concentration values. Optimally, samples were collected after the equilibrium concentration had been attained in hourly intervals. All analytical concentrations reported refer to mg of test substance/m^3 air.

7.8. Collection Efficiency

The sampling equipment was adjusted with calibrated flowmeters or soap-bubble meters according to internationally recognized standards (ACGIH, 1978; Section I "Calibration of Air Sampling Instruments").

7.9. Stability of the Test Atmosphere

The integrity stability of the vapour generation system was monitored continuously using a Total Hydrocarbon Analyzer equipped with FID (flame ionization detector) (Messr. Ratfisch, Munic, Germany). Samples were taken continuously from the vicinity of the breathing zone.

This chamber monitoring allows for an overall survey of toxicologically relevant technical parameters (inlet and exhaust flows as well as atmosphere homogeneity, temporal stability, and generation performance). Interruptions in exposure (e.g. resulting from technical mishaps) are recorded and, if applicable, a commensurate interval is added to the exposure duration for compensation. One representative example of this type of *real-time* monitoring of atmosphere is provided in the Appendix.

7.10. Number of Animals per Group

Five male and five female rats were simultaneously exposed to each concentration under nose-only conditions for 4 h.

7.11. Control Animals

To identify exposure-related effects, comparisons with appropriate controls are conducted. Controls were exposed to conditioned air using almost similar exposure conditions as were used for the test substance (15 liters air/min; duration of exposure = 1 x 4 h; 5 males and females per group; 2 week observation period). Direct comparisons were made between the control and exposure groups.

Note: Control studies are performed under GLP-conditions but without assignment to a particular study. This allows use of control data for several studies that have been performed under similar experimental conditions within a recent time frame. This procedure is in compliance with current testing guidelines as well as animal welfare regulations.

7.12. Body Weights and Duration of Observation Period

Body weights were measured before exposure, on days 3 and 7, and weekly thereafter. Individual weights are also recorded at death, if applicable. The period of observation was 2 weeks.

7.13. Clinical Signs

The appearance and behavior of each rat was examined carefully several times on the day of exposure and twice daily thereafter. Weekend assessments were made once a day (morning). Assessments from restraining tubes were made only if unequivocal signs occurred (e.g. spasms, abnormal movements, severe respiratory signs). Following exposure, observations are made and recorded systematically; individual records are maintained for each animal. Cageside observations included, but were not limited to, changes in the skin and fur, eyes, mucous membranes, respiratory, circulatory, autonomic and central nervous system, and somatomotor activity and behavior pattern. Particular attention was directed to observation of tremors, convulsions, salivation, diarrhea, lethargy, somnolence and prostration. The time of death is recorded as precisely as possible, if applicable.

Since these signs can only be assessed adequately from freely moving animals, no specific assessment was performed during exposure while animals were restrained.

Clinical observations were conducted so as to take into account the pattern of examination consistent with a Functional Observational Battery (FOB). Each rat was first observed in its home cage and then individually examined. The following reflexes were tested, based on recommendations made by Irwin (1968) and Moser et. al. (1988): visual placing response and grip strength on wire mesh, abdominal muscle tone, corneal and pupillary reflexes, pinnal reflex, righting reflex, tail-pinch response, startle reflex with respect to behavioral changes stimulated by sounds (finger snapping) and touch (back).

All signs exceeding the exposure day are reported in the form of incidence tables (see appendix). The resolution of these tables is per one day, the maximum response is always displayed. The incidence of signs will reflect signs from surviving animals. Uncommon signs related to an agonal condition (if applicable) that may be observed on the day of death are recorded but may not be incorporated into the incidence tables. These signs are described in the results if they differ from previous observations.

7.14. Rectal Temperatures

The rectal temperatures were measured directly after cessation of exposure (approximately within ½hour after the end of exposure) using a Digimed H 11 digital thermometer with an F2 rectal probe.

7.15. Necropsy

All surviving rats were sacrificed at the end of the observation period using sodium pentobarbital (approximately 300 mg/kg body weight, intraperitoneal injection). All rats, irrespective of the day of death, were given a gross-pathological examination. Consideration was given to performing a gross necropsy on animals as indicated by the nature of toxic effects, with particular reference to changes related to the respiratory tract. All gross pathological changes were recorded and evaluated.

7.16. Statistical Evaluation of Data

With graphs of means of data, the indicated parameters were evaluated relative to controls (mean = 100%). The single standard deviations are also shown relative to the means of the controls. Statistically significant differences (versus control) are indicated here by asterisks ('*' for $p < 0.05$ and '**' for $p < 0.01$).

Necropsy findings: If specific findings occur from the respiratory tract of surviving rats they are evaluated statistically using the pairwise Fisher test after the R x C chi-squared test (HP 3000, Department of Toxicology, Bayer AG). The Fisher test was only performed if differences occurred between groups in the R x C chi-squared test or if a frequency value of < 5 was calculated. This procedure was performed in accordance with Gad and Weil (1982). For calculation of the unilateral p value a symmetrical distribution was assumed (p unilateral = (p bilateral)/2).

Body weights: Means and single standard deviations of body weights are calculated. Mean body weights are also depicted graphically as a function of time (see Appendix). Since in acute studies individual group means may differ prior to commencement of the first exposure, the body weight gain was statistically evaluated for each group. For these evaluations a one-way ANOVA (vide infra) is used.

Physiological data: Data of rectal temperature measurements are statistically evaluated using the ANOVA procedure (vide infra).

Calculation of the LC_{50}: If calculation of a median lethal concentration (LC_{50}) is possible, it is performed by computer (HP 3000) according to the method of A.P. Rosiello, J.M. Essigmann, and G.N. Wogan (1977) as modified by Pauluhn (1983). This method is based on the maximum-likelihood method of C.I. Bliss (1938). If only 2 pairs of values with greater than 0% lethality and less than 100% are available then the first linear approximation is based on

these values and a χ^2-homogeneity test is not performed. The interpolated concentration at 50% lethality in this case was designated the approximate LC_{50}.

Randomization: A computerized list of random numbers served the purpose to assign animals at random to the treatment groups.

Analysis of variance (ANOVA): This parametric method checks for normal distribution of data by comparing the median and mean. The groups are compared at a confidence level of $(1-\alpha) = 95\%$ ($p = 0.05$). The test for the between-group homogeneity of the variance employed Box's test if more than 2 study groups were compared with each other. If the above F-test shows that the intra-group variability is greater than the inter-group variability, this is shown in the Appendix as *"no statistical difference between the groups"*. If a difference is found then a pairwise post-hoc comparison is conducted (1- and 2-sided) using the Games and Howell modification of the Tukey-Kramer significance test. This program was originally obtained from BCTIC.

7.17. Programming and Validating Software

Software code for the following purposes was written in HP Fortran (HP 3000) or Microsoft Fortran 77 (PC): ANOVA, Fisher test, inhalation chamber and physiological data tabulation program, graphics software. All scratch files were generated using Fortran F8.3 format using the Fortran default rounding routines. Fortran format A was always used to generate alphanumeric tables and graphs; i.e. numbers in figures and tables are rounded-up or -off due to the different format codes of the server. The computer programs were carefully validated. The validation was conducted using published text book data sets (e.g. BCTIC, Gad and Weil, 1982). However, it should be emphasized that the formal GLP-requirements required for software validation were not fulfilled. Wherever possible, raw data and calculated/derived values are displayed graphically to provide a versatile opportunity for data comparison.

7.18. Archiving the Raw Data and the Report

The protocol, raw data, and the final report are archived in locations specified by Bayer AG, in accordance with GLP requirements.

8. RESULTS

8.1. Generation and Characterization of Atmosphere

Technical information concerning generation of test atmospheres is provided in Table 1.

Table 1: Generation and characterization of chamber atmosphere

	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Nominal conc. (mg/m³)	Air control	64	117	175	219	419
Analytical conc. (mg/m³)	--	61.8	87.1	127.9	201.4	395.7
Recovery (%)	--	97	74	73	92	94
N_2-flow rate through impinger (ml/min)	0	5.5	7.0	9.7	13.0	25.0
Weight loss / 4 hours (mg)	--	230	420	630	790	1510
Calculated C_{sat} @ 20 °C (g/m³ air)	--	174	250	271	253	252
Inlet air flow (l/min)	15	15	15	15	15	15
Air flow extracted (l/min)	13	13	13	13	13	13
Temperature (mean, °C)	22	22	22	23	22	22
Rel. Humidity (mean, %)	5	11	4	4	3	4

Recovery: total mass evaporated / total air volume fed through the inhalation chamber per exposure
C_{sat}: total mass evaporated / total nitrogen volume fed through the impinger per exposure
-- = not applicable

Characterization of the test atmospheres: Analytical monitoring of the vapour test atmosphere from the breathing zone (4 samples/exposure) indicated that the exposure conditions were temporally stable over the exposure period. This conclusion was supported by the *real-time* analysis of atmospheres. The recovery of test compound was high in all groups. The slight variability of recovery data appeared to be related to the relatively high total mass of the glass impinger (approximately 50 g) and the small difference in weights before and after exposure (ca. 0.23 - 1.5 g), i.e. minor amounts of adhering water (water bath) may attribute to some inaccurracy of determination of nominal concentrations and recovery data, respectively.

Temperature values in the inhalation chamber were in the range suggested by the testing guidelines. Humidity values were lower; this is undoubtedly related to the use of dry air for generation. No attempt was made to increase humidity since it was believed that the stability of the evapourized test substance is higher in dry air than in humid air. This deviation from the guideline has had no negative impact on the study results.

8.2. Toxicological Results

The results obtained during and after exposures of rats for 4 h to this test substance are summarized in Table 2.

Table 2: Summary of acute inhalation toxicity

Group /sex	Analytical Concentration (mg/m³)	Toxicological Result	Onset and Duration of Signs	Rectal Temperature (°C)	Onset of Mortality (%)
1 / m	0	0 / 0 / 5	--	38.1	--
2 / m	62	0 / 5 / 5	0d - 3d	30.8**	--
3 / m	87	1 / 5 / 5	0d - 9d	30.3**	3d
4 / m	128	4 / 5 / 5	0d - 9d	29.4**	1d - 5d[1]
5 / m	201	4 / 5 / 5	0d - 6d	28.2**	1d - 2d
6 / m	396	5 / 5 / 5	0d - 1d	27.3**	1d - 2d
1 / f	0	0 / 0 / 5	--	38.3	--
2 / f	62	0 / 5 / 5	0d - 3d	32.3**	--
3 / f	87	2 / 5 / 5	0d - 7d	30.9**	1d - 3d
4 / f	128	5 / 5 / 5	0d - 3d	30.6**	1d - 4d[1]
5 / f	201	5 / 5 / 5	0d - 1d	28.6**	1d - 2d
6 / f	396	5 / 5 / 5	0d - 1d	28.0**	1d - 2d

m = males, f = females, -- not applicable, ** $p < 0.01$ (Tukey-Kramer *post hoc* test)
1) Animals died over night

Values given in the 'Toxicological results' column are:
1st = number of dead animals.
2nd = number of animals with signs after cessation of exposure.
3rd = number of animals exposed.

Mortality / LC_{50} Calculation:

LC_{50} - males & females combined: 102 mg/m³ air
Confidence interval (95%): 87 - 121 mg/m³ air
Slope: 2.75

Figures addressing the LC_{50}-calculation are provided in the Appendix. From the survival curves it is evident that mortality occurred during postexposure days one through five. Individual data addressing the time of death are also provided in context with the necropsy data and incidence tables in the Appendix.

Signs and observations:
Details concerning signs and observations are provided in the Appendix as various incidence tables. The following list of signs is focusing on major signs only.

Groups 1: All rats tolerated the treatment without signs.

Group 2: Bradypnoea, laboured breathing pattern, serous discharge from nose, haircoat ungroomed, reduced motility, piloerection.

Group 3 and 4: Bradypnoea, laboured breathing pattern, dyspnea, rales, cyanosis, serous discharge from nose, nose with red encrustations, rhinarium: hyperemia, reduced motility, flaccid appearance, haircoat ungroomed, piloerection.

Group 5 and 6: Bradypnoea, laboured breathing pattern, dyspnea, rales, cyanosis, serous discharge from nose, nose with red encrustations, reduced motility, prostration, flaccid appearance, haircoat ungroomed, piloerection.

Reflex Measurements:
The battery of reflex measurements were made as indicated in the Appendix. Summaries of the reflex data are shown in the Appendix. All animals showed normal reflexes, except some alteration (reduced) in reflexes in groups 5 and 6. These changes occurred in moribund animals and were consistent with the clinical observations.

Rectal Temperature:
Results of the evaluation of the rectal temperature are summarized in Table 2. Individual data are provided in the Appendix. Statistical comparison between groups exposed to the aerosolized test compound with those in the control group did indicate concentration-dependent effect on body temperature. The changes observed in group 2 are considered to be toxicologically insignificant.

Body Weights:
Individual data as well as evaluations of data concerning body weight gain are included in the Appendix. Statistical comparisons of group 1 with 2 to 6 indicated significantly decreased body weights in the post exposure period.

Necropsy:

Individual findings from the gross-pathological examinations are shown in the Appendix. A qualitative description, only for findings of toxicological importance and for toxicological evaluation, is given below.

Animals sacrificed at the end of the observation period:

In rats exposed to the test compound a concentration-dependent increased incidence of macroscopical findings could not be observed.

Animals sacrificed during the observation period:

Lung: distended (no collaps of lung during opening of the thoracic cavity), reddish discolouration and red foci, hydrothorax. Trachea: white foam. Snout: encrustations, discharge, red discolouration. Colour changes in parenchymus organs.

9. EVALUATION AND DISCUSSION

Vapour concentrations of 62 mg/m³ did not induce test substance related mortality. Exposure to 87 mg/m³ air and above was followed by mortality occurring within post exposure days 1 through 5. Marked gender specific differences in susceptibility could not be observed. Exposures to concentrations of 62 mg/m³ and higher were followed by a concentration-dependent bradypnoea, dyspnoea, laboured breathing pattern, rales, snout area with red encrustations, cyanosis, prostration (lying on belly), reduced motility, haircoat ungroomed, hypothermia, decrease in body weights, and piloerection. The duration of signs (maximum duration up to day 9) and, in most instances, was dependent on respiratory signs. Gross necropsy revealed distended, dark-red lungs. Clinical and necropsy findings support the conclusion that a causal relationship between lethality and lung damage existed.

Experimental evidence suggests that 2-CHLORACRYLNITRIL is a potent respiratory tract irritant. Inhalation of respiratory irritants is known to induce reflex changes in the breathing pattern and cardiac output and are reported to be associated with the decline in the metabolic rate and body temperature of rodents (Jaeger and Gearhart, 1982; Mautz and Bufalino, 1989). This is in agreement with findings obtained with other respiratory tract irritants (Mautz and Bufalino, 1989). The present observation in rats may reflect a more labile thermoregulatory physiology among rodents and may involve a complex set of physiological responses that may differ among mammalian species. Ventilatory, cardiovascular, and metabolic rate depression in response to irritant inhalation can be an effective pulmonary defense in rodents and other heterothermic mammals (Mautz and Bufalino, 1989). Also restraint may produce changes in body temperature. However, the rectal temperatures of the control rats determined after cessation of the exposure were in the physiologic range and hence did not indicate marked effects pertinent to restraint. Sensory irritation induces respiratory and concomitantly central distress in animals which appears to be a possible cause of hypothermia.

The evaporated test substance proved to have a high acute inhalation toxicity to rats. Cumulative evidence suggest that there is a causal relationship of local effects to the respiratory tract and the observed findings. The ratio of saturation vapour concentration (@ ca. 20 °C) and LC_{50}-value appears to be greater that 2000. Accordingly, the hazard potential of 2-CHLORACRYLNITRIL is high.

10. KEY TO ABBREVIATIONS

Konz.	Concentration
nomin.	Nominal
analyt.	Analytical
mcm/µm	Micrometer
Expos.	Exposure
STAND, S, Std, s	Standard deviation
MW/MEANS	Means
F	F-test value (F-ratio)
DF	Degrees of freedom
PROB	Probability
SS	Total sum of squares
MS	Mean squares
TREATMENT	- between the groups
ERROR	- within the groups
TOTAL	- total
Observation No.: n-nn	Body weight gain from date n to date nn

11. REFERENCES

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BCTIC Computer Code Collection - Biomedical computing Technology Information Center, ANOVA a Fortran Program to Perform one-way Classification Analysis of Variance. Vanderbilt Medical Center, Nashville Tennessee, U.S.A.

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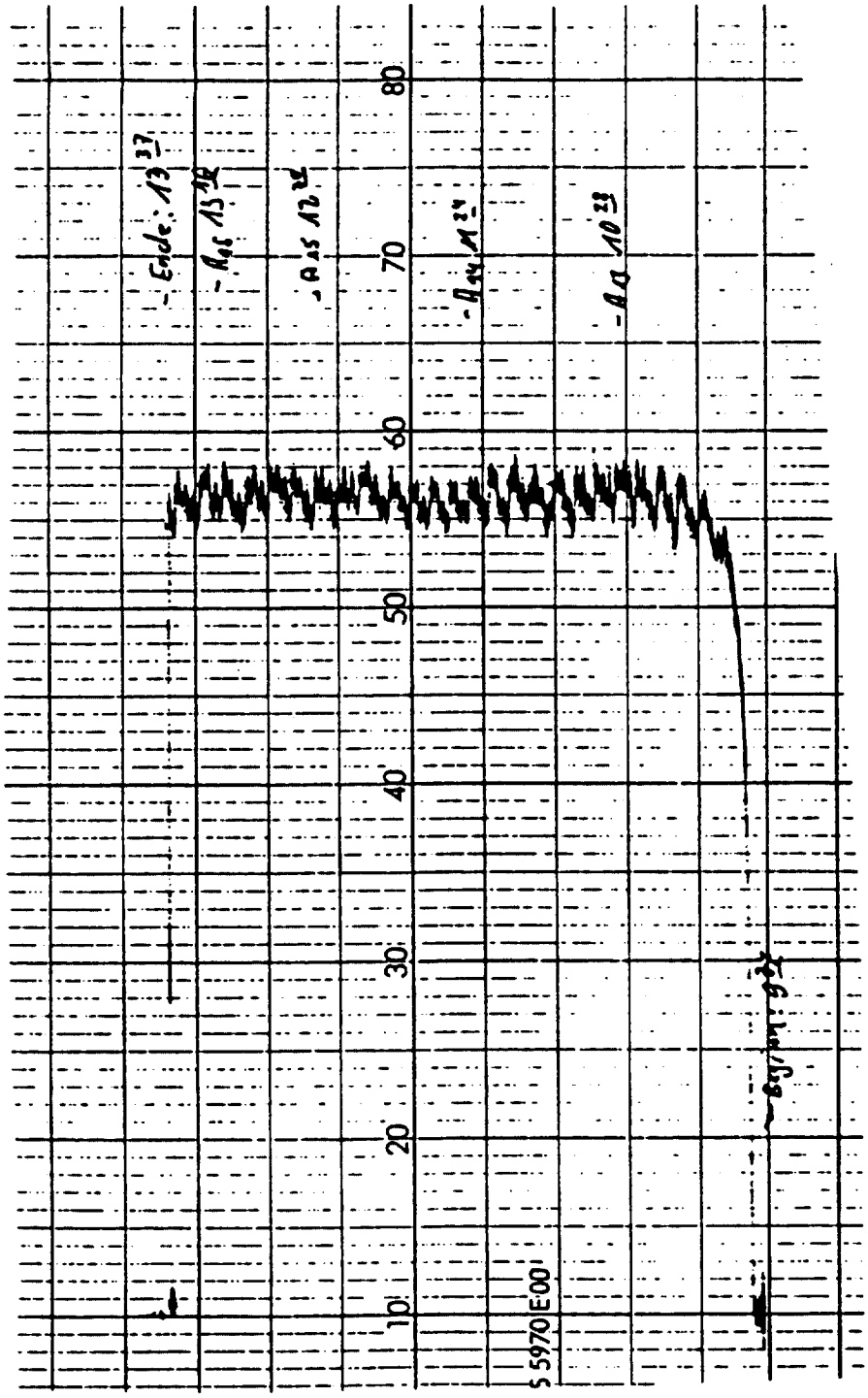
12. APPENDIX

Atmosphere Characterization

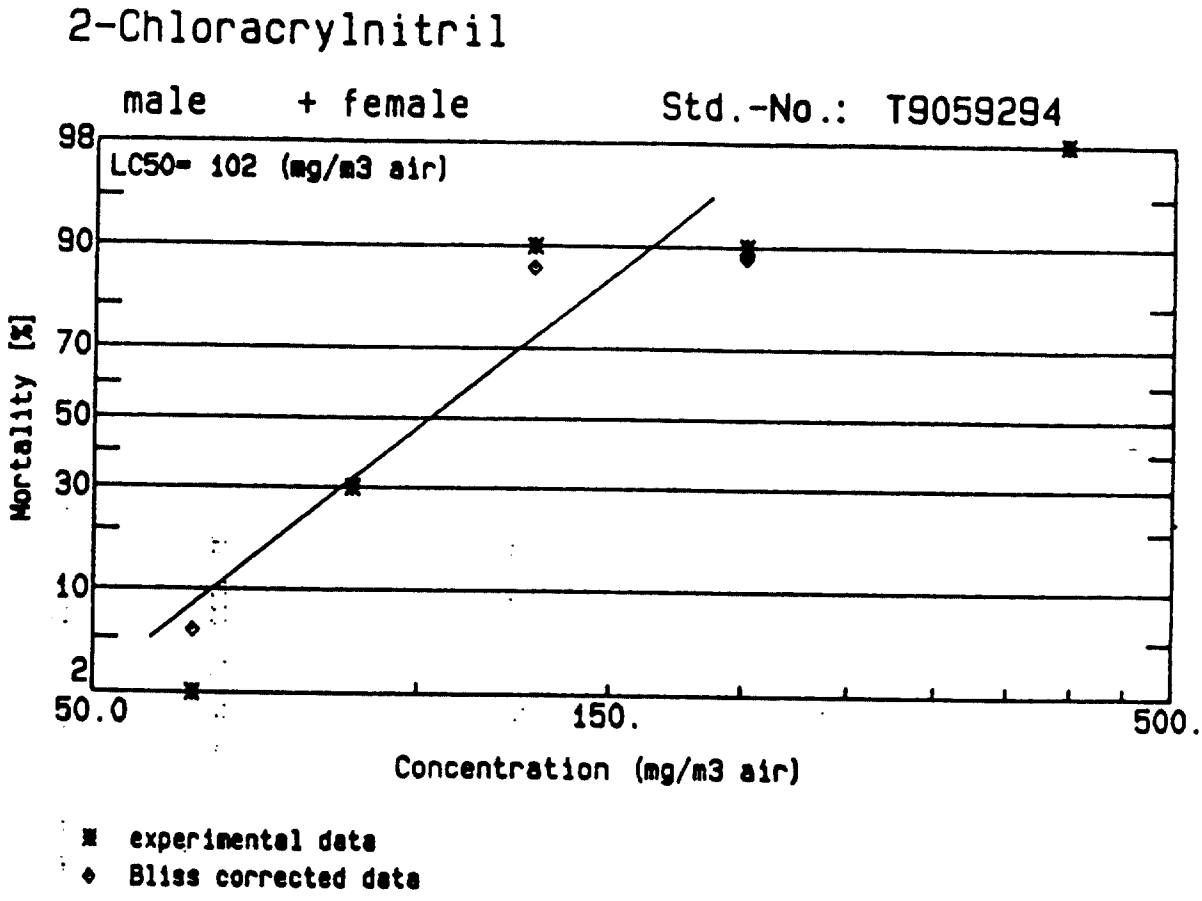
Group	Date of exposure (DD.MM.YY)	Sampled Volume (l)[1] / flow rate (l/min)[1]	Nominal Concentrations (mg/m³ air)	Actual Concentrations (mg/m³ air)	Mean Concentration (mg/m³ air)
1	13.06.1995	n.a.	0 (air control)	0 (air control)	n.a.
2	17.05.1995	10 / 0.5	63.8	57.6, 66.3, 60.8, 62.6	61.8
3	13.06.1995	10 / 0.5	116.6	89.5, 88.5, 82.4, 87.9	87.1
4	23.05.1995	10 / 0.5	174.9	128.9, 131.1, 126.2, 125.5	127.9
5	16.05.1995	10 / 0.5	219.3	202.0, 200.9, 199.3, 203.2	201.4
6	15.05.1995	10 / 0.5	418.7	389.4, 380.4, 400.4, 412.4	395.7

1) If different volumes or flow rates are used only the maximum value is presented

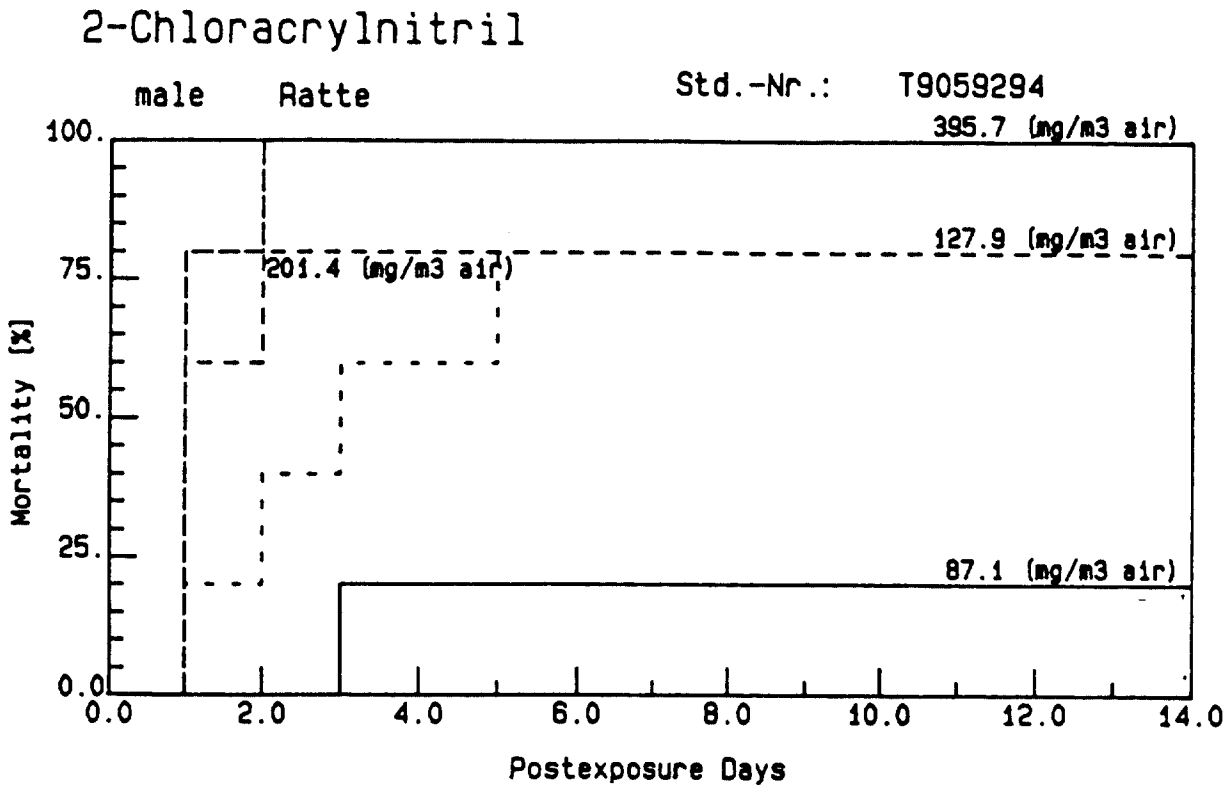
Monitoring of Atmosphere

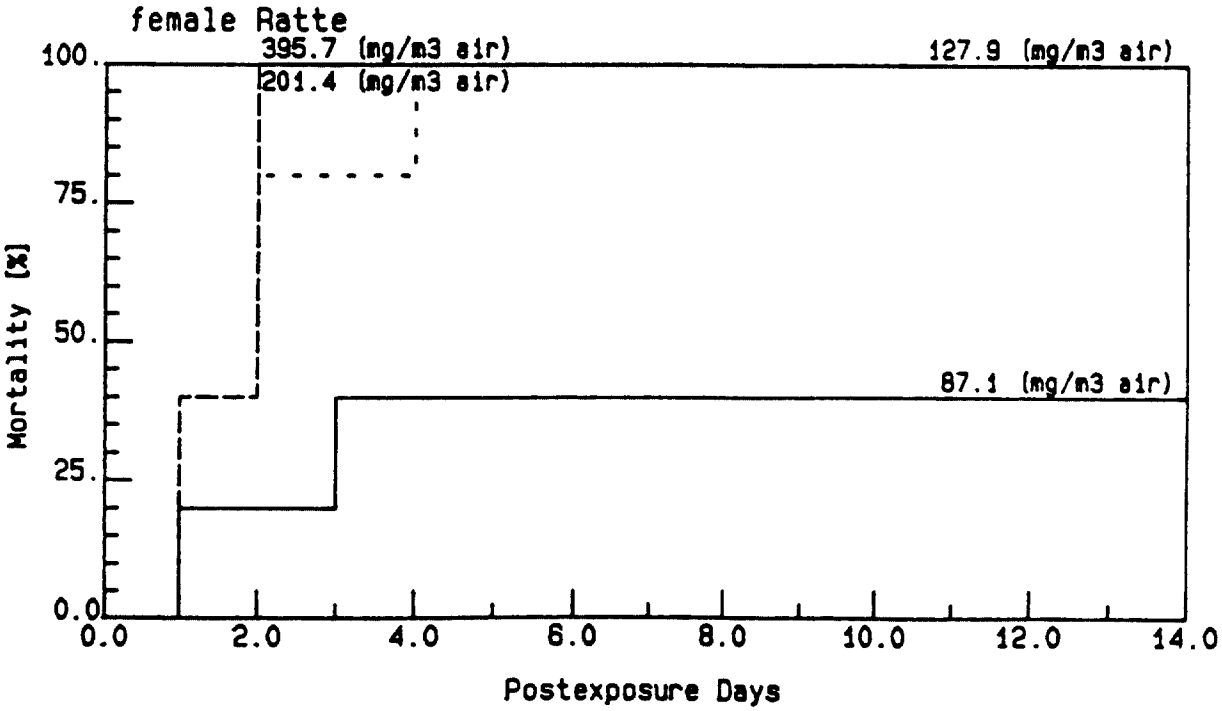


LC50-Calculation



Survival-Curves





Day 0 - Exposure Day

Signs-Incidence-Tables

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Concentration: 0 mg/m3 air / Sex: MALES

Observation	Day Relative 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Motility reduced	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bradypnea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laboured breathing pattern	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dyspnea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rales	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ungroomed hair-coat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Piloerection	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyanosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flaccid appearance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prostration (lying on belly)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Serous discharge from nose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nose with red encrustations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhinarium red discolourations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Surviving animals (N)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

Legend: n = number of animals with signs

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Concentration: 62 mg/m3 air / Sex: MALES

Observation	Day Relative 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Motility reduced	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bradypnea	5	5	5	3	0	0	0	0	0	0	0	0	0	0	0
Laboured breathing pattern	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Dyspnea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rales	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ungroomed hair-coat	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Piloerection	5	5	5	2	0	0	0	0	0	0	0	0	0	0	0
Cyanosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flaccid appearance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prostration (lying on belly)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Serous discharge from nose	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nose with red encrustations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhinarium red discolourations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Surviving animals (N)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

Legend: n = number of animals with signs

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Concentration: 87 mg/m3 air / Sex: MALES

Observation	Day Relative 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Motility reduced	5	5	5	3	0	0	0	0	0	0	0	0	0	0	0
Bradypnea	5	5	5	4	3	2	1	0	0	0	0	0	0	0	0
Laboured breathing pattern	5	5	5	4	2	0	0	0	0	0	0	0	0	0	0
Dyspnea	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Rales	0	2	0	1	2	1	0	0	0	0	0	0	0	0	0
Ungroomed hair-coat	0	5	5	3	0	0	0	0	0	0	0	0	0	0	0
Piloerection	5	5	5	4	4	3	2	2	1	1	0	0	0	0	0
Cyanosis	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Flaccid appearance	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Prostration (lying on belly)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Serous discharge from nose	5	5	4	3	0	0	0	0	0	0	0	0	0	0	0
Nose with red encrustations	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhinarium red discolourations	0	2	2	2	0	0	0	0	0	0	0	0	0	0	0
Surviving animals (N)	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4

Legend: n = number of animals with signs

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Concentration: 128 mg/m3 air / Sex: MALES

Observation	Day Relative 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Motility reduced	5	4	2	1	1	0	0	0	0	0	0	0	0	0	0
Bradypnea	5	4	3	2	2	1	1	1	1	1	0	0	0	0	0
Laboured breathing pattern	5	2	3	1	2	1	1	1	1	0	0	0	0	0	0
Dyspnea	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Rales	0	2	2	1	2	1	1	1	0	0	0	0	0	0	0
Ungroomed hair-coat	0	4	3	2	1	0	0	0	0	0	0	0	0	0	0
Piloerection	5	4	3	2	2	1	1	1	1	1	0	0	0	0	0
Cyanosis	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Flaccid appearance	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0
Prostration (lying on belly)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Serous discharge from nose	5	3	1	1	1	0	0	0	0	0	0	0	0	0	0
Nose with red encrustations	2	4	1	0	0	0	0	0	0	0	0	0	0	0	0
Rhinarium red discolourations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Surviving animals (N)	5	4	3	2	2	1	1	1	1	1	1	1	1	1	1

Legend: n = number of animals with signs

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Concentration: 201 mg/m3 air / Sex: MALES

Observation	Day Relative 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Motility reduced	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0
Bradypnea	5	2	1	1	1	0	0	0	0	0	0	0	0	0	0
Laboured breathing pattern	4	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Dyspnea	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Rales	4	1	1	1	1	0	0	0	0	0	0	0	0	0	0
Ungroomed hair-coat	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0
Piloerection	5	2	1	1	1	1	1	0	0	0	0	0	0	0	0
Cyanosis	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Flaccid appearance	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0
Prostration (lying on belly)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Serous discharge from nose	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Nose with red encrustations	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhinarium red discolourations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Surviving animals (N)	5	2	1	1	1	1	1	1	1	1	1	1	1	1	1

Legend: n = number of animals with signs

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Concentration: 396 mg/m3 air / Sex: MALES

Observation	Day Relative 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Motility reduced	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Bradypnea	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Laboured breathing pattern	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Dyspnea	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Rales	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Ungroomed hair-coat	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Piloerection	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyanosis	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Flaccid appearance	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Prostration (lying on belly)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Serous discharge from nose	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Nose with red encrustations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhinarium red discolourations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Surviving animals (N)	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0

Legend: n = number of animals with signs

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Concentration: 0 mg/m3 air / Sex: FEMALES

Observation	Day Relative 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Motility reduced	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bradypnea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laboured breathing pattern	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dyspnea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rales	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ungroomed hair-coat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Piloerection	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyanosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flaccid appearance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prostration (lying on belly)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Serous discharge from nose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nose with red encrustations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhinarium red discolourations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Surviving animals (N)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

Legend: n = number of animals with signs

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Concentration: 62 mg/m3 air / Sex: FEMALES

Observation	Day Relative 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Motility reduced	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bradypnea	5	5	5	2	0	0	0	0	0	0	0	0	0	0	0
Laboured breathing pattern	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dyspnea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rales	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ungroomed hair-coat	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0
Piloerection	5	5	5	5	0	0	0	0	0	0	0	0	0	0	0
Cyanosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flaccid appearance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prostration (lying on belly)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Serous discharge from nose	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0
Nose with red encrustations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhinarium red discolourations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Surviving animals (N)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

Legend: n = number of animals with signs

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Concentration: 87 mg/m3 air / Sex: FEMALES

Observation	Day Relative 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Motility reduced	5	4	4	1	1	1	1	0	0	0	0	0	0	0	0
Bradypnea	5	4	4	3	3	2	1	1	0	0	0	0	0	0	0
Laboured breathing pattern	5	4	4	3	2	1	1	0	0	0	0	0	0	0	0
Dyspnea	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Rales	0	1	3	2	2	1	0	0	0	0	0	0	0	0	0
Ungroomed hair-coat	0	3	3	0	1	1	1	0	0	0	0	0	0	0	0
Piloerection	5	4	4	1	1	1	1	1	0	0	0	0	0	0	0
Cyanosis	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Flaccid appearance	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0
Prostration (lying on belly)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Serous discharge from nose	5	4	3	2	0	0	0	0	0	0	0	0	0	0	0
Nose with red encrustations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhinarium red discolourations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Surviving animals (N)	5	4	4	3	3	3	3	3	3	3	3	3	3	3	3

Legend: n = number of animals with signs

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Concentration: 128 mg/m3 air / Sex: FEMALES

Observation	Day Relative 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Motility reduced	5	3	1	1	0	0	0	0	0	0	0	0	0	0	0
Bradypnea	5	3	1	1	0	0	0	0	0	0	0	0	0	0	0
Laboured breathing pattern	5	2	1	1	0	0	0	0	0	0	0	0	0	0	0
Dyspnea	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Rales	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Ungroomed hair-coat	0	3	1	1	0	0	0	0	0	0	0	0	0	0	0
Piloerection	5	3	1	1	0	0	0	0	0	0	0	0	0	0	0
Cyanosis	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Flaccid appearance	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Prostration (lying on belly)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Serous discharge from nose	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Nose with red encrustations	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhinarium red discolourations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Surviving animals (N)	5	3	1	1	0	0	0	0	0	0	0	0	0	0	0

Legend: n = number of animals with signs

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Concentration: 201 mg/m3 air / Sex: FEMALES

Observation	Day Relative 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Motility reduced	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Bradypnea	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Laboured breathing pattern	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Dyspnea	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Rales	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Ungroomed hair-coat	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Piloerection	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyanosis	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Flaccid appearance	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Prostration (lying on belly)	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Serous discharge from nose	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Nose with red encrustations	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhinarium red discolourations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Surviving animals (N)	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0

Legend: n = number of animals with signs

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Concentration: 396 mg/m3 air / Sex: FEMALES

Observation	Day Relative 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Motility reduced	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Bradypnea	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Laboured breathing pattern	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Dyspnea	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Rales	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Ungroomed hair-coat	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Piloerection	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyanosis	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Flaccid appearance	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Prostration (lying on belly)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Serous discharge from nose	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Nose with red encrustations	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhinarium red discolourations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Surviving animals (N)	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0

Legend: n = number of animals with signs

Test compound: 2-Chloracrylnitril

Study-no: T9059294

Sign: Motility reduced

Analytical Concentration - mg/m3 air

	0				62				87				128				201				396				0				62				87				128				201				396			
Sex	M				M				M				M				M				M				F				F				F				F				F				F			
Day	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N
0	0	0	0	5	5	0	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	1	4	5	0	0	0	5	4	0	0	5	0	5	0	5	1	4	0	5	0	5	0	5	0	5	0	5
1	0	0	0	5	0	0	0	5	1	3	1	5	2	2	0	4	0	2	0	2	0	0	1	1	0	0	0	5	0	0	0	5	3	0	1	4	2	1	0	3	0	1	2	3	0	0	3	3
2	0	0	0	5	0	0	0	5	2	3	0	5	2	0	0	3	0	1	0	1	0	0	0	0	0	0	0	5	0	0	0	5	3	1	0	4	1	0	0	1	0	0	0	0	0	0	0	0
3	0	0	0	5	0	0	0	5	2	1	0	4	1	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	0	0	3	1	0	0	1	0	0	0	0	0	0	0	0
4	0	0	0	5	0	0	0	5	0	0	0	4	1	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0

Legend: l = slight, m = moderate, s = severe, N = survivors, M = males, F = females

Test compound: 2-Chloracrylnitril

Study-no: T9059294

Sign: Bradypnoea

Analytical Concentration - mg/m3 air

	0				62				87				128				201				396				0				62				87				128				201				396			
Sex	M				M				M				M				M				M				F				F				F				F				F				F			
Day	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N
0	0	0	0	5	5	0	0	5	0	5	0	5	0	5	0	5	0	2	3	5	0	2	3	5	0	0	0	5	5	0	0	5	0	5	0	5	0	5	0	5	0	4	1	5	0	1	4	5
1	0	0	0	5	5	0	0	5	0	5	0	5	0	4	0	4	0	1	1	2	0	0	1	1	0	0	0	5	5	0	0	5	2	2	0	4	0	3	0	3	0	1	2	3	0	2	1	3
2	0	0	0	5	5	0	0	5	1	4	0	5	0	3	0	3	0	1	0	1	0	0	0	0	0	0	0	5	5	0	0	5	2	2	0	4	0	1	0	1	0	0	0	0	0	0	0	0
3	0	0	0	5	3	0	0	5	1	3	0	4	1	1	0	2	0	1	0	1	0	0	0	0	0	0	0	5	2	0	0	5	3	0	0	3	0	1	0	1	0	0	0	0	0	0	0	0
4	0	0	0	5	0	0	0	5	2	1	0	4	2	0	0	2	1	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	2	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	5	0	0	0	5	2	0	0	4	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	5	0	0	0	5	1	0	0	4	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	5	0	0	0	5	0	0	0	4	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	5	0	0	0	5	0	0	0	4	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	5	0	0	0	5	0	0	0	4	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0

Legend: l = slight, m = moderate, s = severe, N = survivors, M = males, F = females

Test compound: 2-Chloracrylnitril

Study-no: T9059294

Sign: Laboured breathing pattern

	Analytical Concentration - mg/m3 air																																															
	0				62				87				128				201				396				0				62				87				128				201				396			
Sex	M				M				M				M				M				M				F				F				F				F				F				F			
Day	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N
0	0	0	0	5	5	0	0	5	0	5	0	5	0	5	0	5	0	2	2	5	0	2	0	5	0	0	0	5	5	0	0	5	2	3	0	5	0	5	0	5	0	2	3	5	0	0	2	5
1	0	0	0	5	1	0	0	5	0	5	0	5	0	2	0	4	0	0	1	2	0	1	0	1	0	0	0	5	0	0	0	5	2	2	0	4	0	2	0	3	0	0	1	3	0	3	0	3
2	0	0	0	5	0	0	0	5	1	4	0	5	0	3	0	3	0	0	1	1	0	0	0	0	0	0	0	5	0	0	0	5	1	2	1	4	0	0	1	1	0	0	0	0	0	0	0	0
3	0	0	0	5	0	0	0	5	1	3	0	4	0	1	0	2	0	1	0	1	0	0	0	0	0	0	0	5	0	0	0	5	2	1	0	3	0	0	1	1	0	0	0	0	0	0	0	0
4	0	0	0	5	0	0	0	5	2	0	0	4	1	1	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	5	0	0	0	5	0	0	0	4	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	5	0	0	0	5	0	0	0	4	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	5	0	0	0	5	0	0	0	4	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	5	0	0	0	5	0	0	0	4	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0

Legend: l = slight, m = moderate, s = severe, N = survivors, M = males, F = females

Test compound: 2-Chloracrylnitril

Study-no: T9059294

Sign: Dyspnoea

	Analytical Concentration - mg/m3 air																																											
	0				62				87				128				201				396				0				62				87				128				201				396			
Sex	M				M				M				M				M				M				F				F				F				F				F				F			
Day	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N
0	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	1	2	0	5	0	0	3	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	3	2	0	5	0	3	0	5
1	0	0	0	5	0	0	0	5	0	1	1	5	0	2	0	4	0	0	1	2	0	1	0	1	0	0	0	5	0	0	0	5	0	1	0	4	0	1	0	3	0	0	3	3	0	1	2	3
2	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0
3	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0
4	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0

Legend: l = slight, m = moderate, s = severe, N = survivors, M = males, F = females

Test compound: 2-Chloracrylnitril

Study-no: T9059294

Sign: Rales

	Analytical Concentration - mg/m3 air																																											
	0				62				87				128				201				396				0				62				87				128				201				396			
Sex	M				M				M				M				M				M				F				F				F				F				F				F			
Day	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N
0	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	4	0	0	5	1	2	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	4	0	0	5	4	0	0	5
1	0	0	0	5	0	0	0	5	1	0	1	5	2	0	0	4	0	1	0	2	1	0	0	1	0	0	0	5	0	0	0	5	0	1	0	4	1	0	0	3	0	2	1	3	0	3	0	3
2	0	0	0	5	0	0	0	5	0	0	0	5	1	1	0	3	0	1	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	1	1	4	0	1	0	1	0	0	0	0	0	0	0	0
3	0	0	0	5	0	0	0	5	1	0	0	4	1	0	0	2	1	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	1	0	3	1	0	0	1	0	0	0	0	0	0	0	0
4	0	0	0	5	0	0	0	5	1	1	0	4	2	0	0	2	1	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	5	0	0	0	5	1	0	0	4	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	5	0	0	0	5	0	0	0	4	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	5	0	0	0	5	0	0	0	4	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0

Legend: l = slight, m = moderate, s = severe, N = survivors, M = males, F = females

Test compound: 2-Chloracrylnitril

Study-no: T9059294

Sign: Ungroomed hair-coat

Analytical Concentration - mg/m3 air

	0				62				87				128				201				396				0				62				87				128				201				396			
Sex	M				M				M				M				M				M				F				F				F				F				F				F			
Day	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N
0	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5
1	0	0	0	5	2	0	0	5	2	3	0	5	1	3	0	4	0	2	0	2	1	0	0	1	0	0	0	5	2	0	0	5	2	1	0	4	2	1	0	3	0	3	0	3	0	2	0	3
2	0	0	0	5	0	0	0	5	2	3	0	5	3	0	0	3	1	0	0	1	0	0	0	0	0	0	0	5	1	0	0	5	1	2	0	4	1	0	0	1	0	0	0	0	0	0	0	0
3	0	0	0	5	0	0	0	5	2	1	0	4	2	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	1	0	0	5	0	0	0	3	1	0	0	1	0	0	0	0	0	0	0	0
4	0	0	0	5	0	0	0	5	0	0	0	4	1	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0

Legend: l = slight, m = moderate, s = severe, N = survivors, M = males, F = females

Test compound: 2-Chloracrylnitril

Study-no: T9059294

Sign: Piloerection

Analytical Concentration - mg/m3 air

	0				62				87				128				201				396				0				62				87				128				201				396			
Sex	M				M				M				M				M				M				F				F				F				F				F				F			
Day	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N
0	0	0	0	5	5	0	0	5	0	5	0	5	3	2	0	5	1	4	0	5	0	5	0	5	0	0	0	5	5	0	0	5	0	5	0	5	3	2	0	5	0	5	0	5	0	5	0	5
1	0	0	0	5	5	0	0	5	0	5	0	5	0	4	0	4	0	2	0	2	0	1	0	1	0	0	0	5	4	1	0	5	2	2	0	4	2	1	0	3	0	3	0	3	0	2	1	3
2	0	0	0	5	5	0	0	5	2	3	0	5	0	3	0	3	0	1	0	1	0	0	0	0	0	0	0	5	4	1	0	5	3	1	0	4	0	1	0	1	0	0	0	0	0	0	0	0
3	0	0	0	5	2	0	0	5	3	1	0	4	1	1	0	2	0	1	0	1	0	0	0	0	0	0	0	5	5	0	0	5	0	1	0	3	1	0	0	1	0	0	0	0	0	0	0	0
4	0	0	0	5	0	0	0	5	3	1	0	4	2	0	0	2	1	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	5	0	0	0	5	3	0	0	4	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	5	0	0	0	5	2	0	0	4	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	5	0	0	0	5	2	0	0	4	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	5	0	0	0	5	1	0	0	4	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	5	0	0	0	5	1	0	0	4	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0

Legend: l = slight, m = moderate, s = severe, N = survivors, M = males, F = females

Test compound: 2-Chloracrylnitril

Study-no: T9059294

Sign: Cyanosis

Analytical Concentration - mg/m3 air

Sex	0 M				62 M				87 M				128 M				201 M				396 M				0 F				62 F				87 F				128 F				201 F				396 F			
Day	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N
0	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	2	0	0	5	2	3	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	2	0	0	5	2	3	0	5
1	0	0	0	5	0	0	0	5	1	0	0	5	2	0	0	4	0	1	0	2	1	0	0	1	0	0	0	5	0	0	0	5	1	0	0	4	1	0	0	3	0	3	0	3	0	3	0	3
2	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0
3	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0
4	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0

Legend: l = slight, m = moderate, s = severe, N = survivors, M = males, F = females

Test compound: 2-Chloracrylnitril

Study-no: T9059294

Sign: Flaccid appearance

	Analytical Concentration - mg/m3 air																																															
	0				62				87				128				201				396				0				62				87				128				201				396			
Sex	M				M				M				M				M				M				F				F				F				F				F				F			
Day	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N
0	0	0	0	5	0	0	0	5	0	0	0	5	1	0	0	5	5	0	0	5	0	5	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	5	0	0	5	0	5	0	5
1	0	0	0	5	0	0	0	5	1	1	0	5	2	0	0	4	0	1	1	2	0	1	0	1	0	0	0	5	0	0	0	5	1	0	0	4	1	0	0	3	0	1	2	3	0	3	0	3
2	0	0	0	5	0	0	0	5	0	0	0	5	1	0	0	3	0	1	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	4	1	0	0	1	0	0	0	0	0	0	0	0
3	0	0	0	5	0	0	0	5	0	0	0	4	1	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	1	0	0	1	0	0	0	0	0	0	0	0
4	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0

Legend: l = slight, m = moderate, s = severe, N = survivors, M = males, F = females

Test compound: 2-Chloracrylnitril

Study-no: T9059294

Sign: Prostration (lying on belly)

Analytical Concentration - mg/m3 air

	0				62				87				128				201				396				0				62				87				128				201				396			
Sex	M				M				M				M				M				M				F				F				F				F				F				F			
Day	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N
0	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5
1	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	4	0	1	0	2	0	0	0	1	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	3	0	2	0	3	0	0	0	3
2	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0
3	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0
4	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0

Legend: l = slight, m = moderate, s = severe, N = survivors, M = males, F = females

Test compound: 2-Chloracrylnitril

Study-no: T9059294

Sign: Serous discharge from nose

	Analytical Concentration - mg/m3 air																																															
	0				62				87				128				201				396				0				62				87				128				201				396			
Sex	M				M				M				M				M				M				F				F				F				F				F				F			
Day	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N
0	0	0	0	5	0	1	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	0	0	5	0	0	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5	0	5
1	0	0	0	5	0	0	0	5	0	5	0	5	0	3	0	4	0	2	0	2	0	1	0	1	0	0	0	5	1	1	0	5	0	4	0	4	0	3	0	3	0	3	0	3	0	3	0	3
2	0	0	0	5	0	0	0	5	0	4	0	5	0	1	0	3	0	0	0	1	0	0	0	0	0	0	0	5	1	2	0	5	0	3	0	4	0	0	0	1	0	0	0	0	0	0	0	0
3	0	0	0	5	0	0	0	5	0	3	0	4	0	1	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	2	0	3	0	0	0	1	0	0	0	0	0	0	0	0
4	0	0	0	5	0	0	0	5	0	0	0	4	0	1	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0

Legend: l = slight, m = moderate, s = severe, N = survivors, M = males, F = females

Test compound: 2-Chloracrylnitril

Study-no: T9059294

Sign: Nose with red encrustations

	Analytical Concentration - mg/m3 air																																															
	0				62				87				128				201				396				0				62				87				128				201				396			
Sex	M				M				M				M				M				M				F				F				F				F				F				F			
Day	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N
0	0	0	0	5	0	0	0	5	0	1	0	5	0	2	0	5	0	2	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	1	0	5	0	1	0	5	0	1	0	5
1	0	0	0	5	0	0	0	5	0	1	0	5	0	4	0	4	0	0	0	2	0	0	0	1	0	0	0	5	0	0	0	5	0	0	0	4	0	1	0	3	0	1	0	3	0	0	0	3
2	0	0	0	5	0	0	0	5	0	0	0	5	0	1	0	3	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0
3	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0
4	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0

Legend: l = slight, m = moderate, s = severe, N = survivors, M = males, F = females

Test compound: 2-Chloracrylnitril

Study-no: T9059294

Sign: Rhinarium red discolourations

	Analytical Concentration - mg/m3 air																																															
	0				62				87				128				201				396				0				62				87				128				201				396			
Sex	M				M				M				M				M				M				F				F				F				F				F				F			
Day	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N	l	m	s	N
0	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5
1	0	0	0	5	0	0	0	5	0	2	0	5	0	0	0	4	0	0	0	2	0	0	0	1	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	3	0	0	0	3	0	0	0	3
2	0	0	0	5	0	0	0	5	0	2	0	5	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0
3	0	0	0	5	0	0	0	5	0	2	0	4	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0
4	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0

Legend: l = slight, m = moderate, s = severe, N = survivors, M = males, F = females

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Sign: Motility reduced

	Analytical Concentration - mg/m3 air											
	0	62	87	128	201	396	0	62	87	128	201	396
Sex	M	M	M	M	M	M	F	F	F	F	F	F
Day	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N
0	0/ 5	5/ 5	5/ 5	5/ 5	5/ 5	5/ 5	0/ 5	4/ 5	5/ 5	5/ 5	5/ 5	5/ 5
1	0/ 5	0/ 5	5/ 5	4/ 4	2/ 2	1/ 1	0/ 5	0/ 5	4/ 4	3/ 3	3/ 3	3/ 3
2	0/ 5	0/ 5	5/ 5	2/ 3	1/ 1	0/ 0	0/ 5	0/ 5	4/ 4	1/ 1	0/ 0	0/ 0
3	0/ 5	0/ 5	3/ 4	1/ 2	0/ 1	0/ 0	0/ 5	0/ 5	1/ 3	1/ 1	0/ 0	0/ 0
4	0/ 5	0/ 5	0/ 4	1/ 2	0/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
5	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
6	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
7	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
8	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
9	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
10	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
11	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
12	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
13	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
14	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0

Legend: n = number of animals with signs, N = survivors
M = males, F = females

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Sign: Bradypnea

	Analytical Concentration - mg/m3 air											
	0	62	87	128	201	396	0	62	87	128	201	396
Sex	M	M	M	M	M	M	F	F	F	F	F	F
Day	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N
0	0/ 5	5/ 5	5/ 5	5/ 5	5/ 5	5/ 5	0/ 5	5/ 5	5/ 5	5/ 5	5/ 5	5/ 5
1	0/ 5	5/ 5	5/ 5	4/ 4	2/ 2	1/ 1	0/ 5	5/ 5	4/ 4	3/ 3	3/ 3	3/ 3
2	0/ 5	5/ 5	5/ 5	3/ 3	1/ 1	0/ 0	0/ 5	5/ 5	4/ 4	1/ 1	0/ 0	0/ 0
3	0/ 5	3/ 5	4/ 4	2/ 2	1/ 1	0/ 0	0/ 5	2/ 5	3/ 3	1/ 1	0/ 0	0/ 0
4	0/ 5	0/ 5	3/ 4	2/ 2	1/ 1	0/ 0	0/ 5	0/ 5	3/ 3	0/ 0	0/ 0	0/ 0
5	0/ 5	0/ 5	2/ 4	1/ 1	0/ 1	0/ 0	0/ 5	0/ 5	2/ 3	0/ 0	0/ 0	0/ 0
6	0/ 5	0/ 5	1/ 4	1/ 1	0/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
7	0/ 5	0/ 5	0/ 4	1/ 1	0/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
8	0/ 5	0/ 5	0/ 4	1/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
9	0/ 5	0/ 5	0/ 4	1/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
10	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0
11	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
12	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
13	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
14	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0

Legend: n = number of animals with signs, N = survivors
M = males, F = females

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Sign: Laboured breathing pattern

	Analytical Concentration - mg/m3 air											
	0	62	87	128	201	396	0	62	87	128	201	396
Sex	M	M	M	M	M	M	F	F	F	F	F	F
Day	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N
0	0/ 5	5/ 5	5/ 5	5/ 5	4/ 5	2/ 5	0/ 5	5/ 5	5/ 5	5/ 5	5/ 5	2/ 5
1	0/ 5	1/ 5	5/ 5	2/ 4	1/ 2	1/ 1	0/ 5	0/ 5	4/ 4	2/ 3	1/ 3	3/ 3
2	0/ 5	0/ 5	5/ 5	3/ 3	1/ 1	0/ 0	0/ 5	0/ 5	4/ 4	1/ 1	0/ 0	0/ 0
3	0/ 5	0/ 5	4/ 4	1/ 2	1/ 1	0/ 0	0/ 5	0/ 5	3/ 3	1/ 1	0/ 0	0/ 0
4	0/ 5	0/ 5	2/ 4	2/ 2	0/ 1	0/ 0	0/ 5	0/ 5	2/ 3	0/ 0	0/ 0	0/ 0
5	0/ 5	0/ 5	0/ 4	1/ 1	0/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
6	0/ 5	0/ 5	0/ 4	1/ 1	0/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
7	0/ 5	0/ 5	0/ 4	1/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
8	0/ 5	0/ 5	0/ 4	1/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
9	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
10	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
11	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
12	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
13	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
14	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0

Legend: n = number of animals with signs, N = survivors
M = males, F = females

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Sign: Dyspnea

	Analytical Concentration - mg/m3 air											
	0	62	87	128	201	396	0	62	87	128	201	396
Sex	M	M	M	M	M	M	F	F	F	F	F	F
Day	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N
0	0/ 5	0/ 5	0/ 5	0/ 5	3/ 5	3/ 5	0/ 5	0/ 5	0/ 5	0/ 5	5/ 5	3/ 5
1	0/ 5	0/ 5	2/ 5	2/ 4	1/ 2	1/ 1	0/ 5	0/ 5	1/ 4	1/ 3	3/ 3	3/ 3
2	0/ 5	0/ 5	0/ 5	0/ 3	0/ 1	0/ 0	0/ 5	0/ 5	0/ 4	0/ 1	0/ 0	0/ 0
3	0/ 5	0/ 5	0/ 4	0/ 2	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 1	0/ 0	0/ 0
4	0/ 5	0/ 5	0/ 4	0/ 2	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
5	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
6	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
7	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
8	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
9	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
10	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0
11	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
12	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
13	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
14	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0

Legend: n = number of animals with signs, N = survivors
M = males, F = females

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Sign: Rales

	Analytical Concentration - mg/m3 air											
	0	62	87	128	201	396	0	62	87	128	201	396
Sex	M	M	M	M	M	M	F	F	F	F	F	F
Day	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N
0	0/ 5	0/ 5	0/ 5	0/ 5	4/ 5	3/ 5	0/ 5	0/ 5	0/ 5	0/ 5	4/ 5	4/ 5
1	0/ 5	0/ 5	2/ 5	2/ 4	1/ 2	1/ 1	0/ 5	0/ 5	1/ 4	1/ 3	3/ 3	3/ 3
2	0/ 5	0/ 5	0/ 5	2/ 3	1/ 1	0/ 0	0/ 5	0/ 5	3/ 4	1/ 1	0/ 0	0/ 0
3	0/ 5	0/ 5	1/ 4	1/ 2	1/ 1	0/ 0	0/ 5	0/ 5	2/ 3	1/ 1	0/ 0	0/ 0
4	0/ 5	0/ 5	2/ 4	2/ 2	1/ 1	0/ 0	0/ 5	0/ 5	2/ 3	0/ 0	0/ 0	0/ 0
5	0/ 5	0/ 5	1/ 4	1/ 1	0/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
6	0/ 5	0/ 5	0/ 4	1/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
7	0/ 5	0/ 5	0/ 4	1/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
8	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
9	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
10	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
11	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
12	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
13	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
14	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0

Legend: n = number of animals with signs, N = survivors
M = males, F = females

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Sign: Ungroomed hair-coat

	Analytical Concentration - mg/m3 air											
	0	62	87	128	201	396	0	62	87	128	201	396
Sex	M	M	M	M	M	M	F	F	F	F	F	F
Day	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N
0	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5
1	0/ 5	2/ 5	5/ 5	4/ 4	2/ 2	1/ 1	0/ 5	2/ 5	3/ 4	3/ 3	3/ 3	2/ 3
2	0/ 5	0/ 5	5/ 5	3/ 3	1/ 1	0/ 0	0/ 5	1/ 5	3/ 4	1/ 1	0/ 0	0/ 0
3	0/ 5	0/ 5	3/ 4	2/ 2	0/ 1	0/ 0	0/ 5	1/ 5	0/ 3	1/ 1	0/ 0	0/ 0
4	0/ 5	0/ 5	0/ 4	1/ 2	0/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
5	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
6	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
7	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
8	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
9	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
10	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	C
11	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
12	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
13	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
14	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0

Legend: n = number of animals with signs, N = survivors
M = males, F = females

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Sign: Piloerection

	Analytical Concentration - mg/m3 air											
	0	62	87	128	201	396	0	62	87	128	201	396
Sex	M	M	M	M	M	M	F	F	F	F	F	F
Day	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N
0	0/ 5	5/ 5	5/ 5	5/ 5	5/ 5	5/ 5	0/ 5	5/ 5	5/ 5	5/ 5	5/ 5	5/ 5
1	0/ 5	5/ 5	5/ 5	4/ 4	2/ 2	1/ 1	0/ 5	5/ 5	4/ 4	3/ 3	3/ 3	3/ 3
2	0/ 5	5/ 5	5/ 5	3/ 3	1/ 1	0/ 0	0/ 5	5/ 5	4/ 4	1/ 1	0/ 0	0/ 0
3	0/ 5	2/ 5	4/ 4	2/ 2	1/ 1	0/ 0	0/ 5	5/ 5	1/ 3	1/ 1	0/ 0	0/ 0
4	0/ 5	0/ 5	4/ 4	2/ 2	1/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
5	0/ 5	0/ 5	3/ 4	1/ 1	1/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
6	0/ 5	0/ 5	2/ 4	1/ 1	1/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
7	0/ 5	0/ 5	2/ 4	1/ 1	0/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
8	0/ 5	0/ 5	1/ 4	1/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
9	0/ 5	0/ 5	1/ 4	1/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
10	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
11	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
12	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
13	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
14	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0

Legend: n = number of animals with signs, N = survivors
M = males, F = females

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Sign: Cyanosis

	Analytical Concentration - mg/m3 air											
	0	62	87	128	201	396	0	62	87	128	201	396
Sex	M	M	M	M	M	M	F	F	F	F	F	F
Day	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N
0	0/ 5	0/ 5	0/ 5	0/ 5	2/ 5	5/ 5	0/ 5	0/ 5	0/ 5	0/ 5	2/ 5	5/ 5
1	0/ 5	0/ 5	1/ 5	2/ 4	1/ 2	1/ 1	0/ 5	0/ 5	1/ 4	1/ 3	3/ 3	3/ 3
2	0/ 5	0/ 5	0/ 5	0/ 3	0/ 1	0/ 0	0/ 5	0/ 5	0/ 4	0/ 1	0/ 0	0/ 0
3	0/ 5	0/ 5	0/ 4	0/ 2	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 1	0/ 0	0/ 0
4	0/ 5	0/ 5	0/ 4	0/ 2	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
5	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
6	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
7	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
8	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
9	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
10	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/
11	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
12	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
13	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
14	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0

Legend: n = number of animals with signs, N = survivors
M = males, F = females

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Sign: Flaccid appearance

	Analytical Concentration - mg/m3 air											
	0	62	87	128	201	396	0	62	87	128	201	396
Sex	M	M	M	M	M	M	F	F	F	F	F	F
Day	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N
0	0/ 5	0/ 5	0/ 5	1/ 5	5/ 5	5/ 5	0/ 5	0/ 5	0/ 5	0/ 5	5/ 5	5/ 5
1	0/ 5	0/ 5	2/ 5	2/ 4	2/ 2	1/ 1	0/ 5	0/ 5	1/ 4	1/ 3	3/ 3	3/ 3
2	0/ 5	0/ 5	0/ 5	1/ 3	1/ 1	0/ 0	0/ 5	0/ 5	0/ 4	1/ 1	0/ 0	0/ 0
3	0/ 5	0/ 5	0/ 4	1/ 2	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	1/ 1	0/ 0	0/ 0
4	0/ 5	0/ 5	0/ 4	0/ 2	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
5	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
6	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	1/ 3	0/ 0	0/ 0	0/ 0
7	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
8	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
9	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
10	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
11	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
12	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
13	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
14	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0

Legend: n = number of animals with signs, N = survivors
M = males, F = females

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Sign: Prostration (lying on belly)

	Analytical Concentration - mg/m3 air											
	0	62	87	128	201	396	0	62	87	128	201	396
Sex	M	M	M	M	M	M	F	F	F	F	F	F
Day	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N
0	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5
1	0/ 5	0/ 5	0/ 5	0/ 4	1/ 2	0/ 1	0/ 5	0/ 5	0/ 4	0/ 3	2/ 3	0/ 3
2	0/ 5	0/ 5	0/ 5	0/ 3	0/ 1	0/ 0	0/ 5	0/ 5	0/ 4	0/ 1	0/ 0	0/ 0
3	0/ 5	0/ 5	0/ 4	0/ 2	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 1	0/ 0	0/ 0
4	0/ 5	0/ 5	0/ 4	0/ 2	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
5	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
6	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
7	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
8	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
9	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
10	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0
11	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
12	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
13	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
14	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0

Legend: n = number of animals with signs, N = survivors
M = males, F = females

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Sign: Serous discharge from nose

	Analytical Concentration - mg/m3 air											
	0	62	87	128	201	396	0	62	87	128	201	396
Sex	M	M	M	M	M	M	F	F	F	F	F	F
Day	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N
0	0/ 5	1/ 5	5/ 5	5/ 5	5/ 5	5/ 5	0/ 5	0/ 5	5/ 5	5/ 5	5/ 5	5/ 5
1	0/ 5	0/ 5	5/ 5	3/ 4	2/ 2	1/ 1	0/ 5	2/ 5	4/ 4	3/ 3	3/ 3	3/ 3
2	0/ 5	0/ 5	4/ 5	1/ 3	0/ 1	0/ 0	0/ 5	3/ 5	3/ 4	0/ 1	0/ 0	0/ 0
3	0/ 5	0/ 5	3/ 4	1/ 2	0/ 1	0/ 0	0/ 5	0/ 5	2/ 3	0/ 1	0/ 0	0/ 0
4	0/ 5	0/ 5	0/ 4	1/ 2	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
5	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
6	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
7	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
8	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
9	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
10	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
11	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
12	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
13	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
14	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0

Legend: n = number of animals with signs, N = survivors
M = males, F = females

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Sign: Nose with red encrustations

	Analytical Concentration - mg/m3 air											
	0	62	87	128	201	396	0	62	87	128	201	396
Sex	M	M	M	M	M	M	F	F	F	F	F	F
Day	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N
0	0/ 5	0/ 5	1/ 5	2/ 5	2/ 5	0/ 5	0/ 5	0/ 5	0/ 5	1/ 5	1/ 5	1/ 5
1	0/ 5	0/ 5	1/ 5	4/ 4	0/ 2	0/ 1	0/ 5	0/ 5	0/ 4	1/ 3	1/ 3	0/ 3
2	0/ 5	0/ 5	0/ 5	1/ 3	0/ 1	0/ 0	0/ 5	0/ 5	0/ 4	0/ 1	0/ 0	0/ 0
3	0/ 5	0/ 5	0/ 4	0/ 2	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 1	0/ 0	0/ 0
4	0/ 5	0/ 5	0/ 4	0/ 2	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
5	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
6	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
7	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
8	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
9	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
10	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	(
11	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
12	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
13	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
14	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0

Legend: n = number of animals with signs, N = survivors
M = males, F = females

Test compound: 2-Chloracrylnitril
Study-no: T9059294

Sign: Rhinarium red discolourations

	Analytical Concentration - mg/m3 air											
	0	62	87	128	201	396	0	62	87	128	201	396
Sex	M	M	M	M	M	M	F	F	F	F	F	F
Day	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N	n/N
0	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5	0/ 5
1	0/ 5	0/ 5	2/ 5	0/ 4	0/ 2	0/ 1	0/ 5	0/ 5	0/ 4	0/ 3	0/ 3	0/ 3
2	0/ 5	0/ 5	2/ 5	0/ 3	0/ 1	0/ 0	0/ 5	0/ 5	0/ 4	0/ 1	0/ 0	0/ 0
3	0/ 5	0/ 5	2/ 4	0/ 2	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 1	0/ 0	0/ 0
4	0/ 5	0/ 5	0/ 4	0/ 2	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
5	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
6	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
7	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
8	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
9	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
10	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
11	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
12	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
13	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0
14	0/ 5	0/ 5	0/ 4	0/ 1	0/ 1	0/ 0	0/ 5	0/ 5	0/ 3	0/ 0	0/ 0	0/ 0

Legend: n = number of animals with signs, N = survivors
M = males, F = females

Reflexes

Measurements on day: 1 / MALES

Type of Reflex	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Number of animals investigated	5	5	5	4	3	5
Visual placing response	0	0	0	0	0	0
Grip strength	0	0	0	0	2	4[1]
Tonus	0	0	0	0	0	1[1]
Cornea reflex	0	0	0	0	0	0
Light reflex	0	0	0	0	0	0
Pinna reflex	0	0	0	0	0	0
Startle reflex / sound	0	0	0	0	0	0
Startle reflex / touch	0	0	0	0	0	0
Tail-pinch response	0	0	0	0	0	0
Righting response	0	0	0	0	1	1[1]

#: number of rats showing abnormal reflexes; 1) reduced or no reaction

Measurements on day: 1 / FEMALES

Type of Reflex	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Number of animals investigated	5	5	5	3	3	4
Visual placing response	0	0	0	0	0	0
Grip strength	0	0	0	0	3	3[1]
Tonus	0	0	0	0	0	0
Cornea reflex	0	0	0	0	0	0
Light reflex	0	0	0	0	0	0
Pinna reflex	0	0	0	0	0	0
Startle reflex / sound	0	0	0	0	0	1[1]
Startle reflex / touch	0	0	0	0	0	0
Tail-pinch response	0	0	0	0	0	0
Righting response	0	0	0	0	1	1[1]

#: number of rats showing abnormal reflexes; 1) reduced or no reaction

Measurements were repeated in group 5 on day 3. The surviving male rat did not show any effects on reflexes.

ONE-WAY ANALYSIS OF VARIANCE PROGRAM : ANOVA

Analysis of Rectal Temperature (Deg.Cel.) / MALES

Group-no.: 1 - Animal:1-5 - control

37.900	37.900	38.100	38.000	38.300
MEDIAN= 38.000	MEAN= 38.040	STD = .167		

Group-no.: 2 - Animal:31-35 - 62 mg/m3 air

31.200	30.400	31.300	30.000	31.100
MEDIAN= 31.100	MEAN= 30.800	STD = .570		

Group-no.: 3 - Animal:51-55 - 87 mg/m3 air

30.100	30.400	30.100	30.200	30.600
MEDIAN= 30.200	MEAN= 30.280	STD = .217		

Group-no.: 4 - Animal:41-45 - 128 mg/m3 air

29.200	29.500	29.500	29.300	29.400
MEDIAN= 29.400	MEAN= 29.380	STD = .130		

Group-no.: 5 - Animal:21-25 - 201 mg/m3 air

27.700	29.100	28.000	28.100	27.900
MEDIAN= 28.000	MEAN= 28.160	STD = .546		

Group-no.: 6 - Animal:11-15 - 396 mg/m3 air

27.600	27.000	27.200	27.700	27.000
MEDIAN= 27.200	MEAN= 27.300	STD = .332		

BOX'S TEST FOR HOMOGENEITY OF VARIANCES AT P=.05000 LEVEL

CALCULATED F	D.F.'S	PROBABILITY
2.4632	5 & 741.	.0312

HETEROGENEOUS VARIANCES (ONE-TAILED TEST)

ONE-WAY CLASSIFICATION ANALYSIS OF VARIANCE

SOURCE	SS	DF	MS	F	PROB
TREATMENT	369.0	5	73.806	536.774	.000
ERROR	3.300	24	.13750		
TOTAL	372.3	29			

OVERALL SIGNIFICANCE AT 5.% (ONE-TAILED) LEVEL

GAMES AND HOWELL MODIFICATION OF
TUKEY-KRAMER'S HONESTLY SIGNIFICANT DIFFERENCE TEST
(WITH THE STUDENTIZED RANGE STATISTIC)

GROUPS COMPARED	CALCULATED TEST VALUE	DEGREES OF FREEDOM	PROBABILITY	CONCLUSION
5. % ONE-TAILED TEST				
1 AND 2	-38.53	5	.0000	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 2	38.53	5	.0000	SIGNIFICANT
5. % ONE-TAILED TEST				
1 AND 3	-89.60	8	.0000	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 3	89.60	8	.0000	SIGNIFICANT
5. % ONE-TAILED TEST				
1 AND 4	-129.10	8	.0000	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 4	129.10	8	.0000	SIGNIFICANT
5. % ONE-TAILED TEST				
1 AND 5	-54.72	5	.0000	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 5	54.72	5	.0000	SIGNIFICANT
5. % ONE-TAILED TEST				
1 AND 6	-91.42	6	.0000	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 6	91.42	6	.0000	SIGNIFICANT
5. % ONE-TAILED TEST				
2 AND 3	-2.70	5	.4871	NOT SIGNIFICANT
5. % TWO-TAILED TEST				
2 AND 3	2.70	5	.4871	NOT SIGNIFICANT
5. % ONE-TAILED TEST				
2 AND 4	-7.68	4	.0316	SIGNIFICANT
5. % TWO-TAILED TEST				
2 AND 4	7.68	4	.0316	NOT SIGNIFICANT
5. % ONE-TAILED TEST				
2 AND 5	-10.58	8	.0006	SIGNIFICANT
5. % TWO-TAILED TEST				

2 AND 5 10.58 5. % ONE-TAILED TEST	8	.0006	SIGNIFICANT
2 AND 6 -16.78 5. % TWO-TAILED TEST	6	.0000	SIGNIFICANT
2 AND 6 16.78 5. % ONE-TAILED TEST	6	.0000	SIGNIFICANT
3 AND 4 -11.25 5. % TWO-TAILED TEST	7	.0006	SIGNIFICANT
3 AND 4 11.25 5. % ONE-TAILED TEST	7	.0006	SIGNIFICANT
3 AND 5 -11.41 5. % TWO-TAILED TEST	5	.0022	SIGNIFICANT
3 AND 5 11.41 5. % ONE-TAILED TEST	5	.0022	SIGNIFICANT
3 AND 6 -23.78 5. % TWO-TAILED TEST	7	.0000	SIGNIFICANT
3 AND 6 23.78 5. % ONE-TAILED TEST	7	.0000	SIGNIFICANT
4 AND 5 -6.87 5. % TWO-TAILED TEST	4	.0461	SIGNIFICANT
4 AND 5 6.87 5. % ONE-TAILED TEST	4	.0461	NOT SIGNIFICANT
4 AND 6 -18.46 5. % TWO-TAILED TEST	5	.0000	SIGNIFICANT
4 AND 6 18.46 5. % ONE-TAILED TEST	5	.0000	SIGNIFICANT
5 AND 6 -4.26 5. % TWO-TAILED TEST	7	.1295	NOT SIGNIFICANT
5 AND 6 4.26	7	.1295	NOT SIGNIFICANT

ONE-WAY ANALYSIS OF VARIANCE PROGRAM : ANOVA

Analysis of Rectal Temperature (Deg.Cel.) / FEMALES

Group-no.: 1 - Animal:6-10 - control

38.200	38.300	38.300	38.100	38.400
MEDIAN=	38.300	MEAN= 38.260	STD =	.114

Group-no.: 2 - Animal:36-40 - 62 mg/m3 air

33.400	32.600	32.300	32.400	30.900
MEDIAN=	32.400	MEAN= 32.320	STD =	.904

Group-no.: 3 - Animal:56-60 - 87 mg/m3 air

30.900	31.700	30.600	30.700	30.700
MEDIAN=	30.700	MEAN= 30.920	STD =	.449

Group-no.: 4 - Animal:46-50 - 128 mg/m3 air

30.000	30.400	31.300	30.800	30.400
MEDIAN=	30.400	MEAN= 30.580	STD =	.492

Group-no.: 5 - Animal:26-30 - 201 mg/m3 air

28.200	29.300	27.600	29.200	28.500
MEDIAN=	28.500	MEAN= 28.560	STD =	.709

Group-no.: 6 - Animal:16-20 - 396 mg/m3 air

26.900	28.100	27.200	28.800	28.900
MEDIAN=	28.100	MEAN= 27.980	STD =	.909

BOX'S TEST FOR HOMOGENEITY OF VARIANCES AT P=.05000 LEVEL

CALCULATED F	D.F.'S	PROBABILITY
2.5286	5 & 741.	.0275

HETEROGENEOUS VARIANCES (ONE-TAILED TEST)

ONE-WAY CLASSIFICATION ANALYSIS OF VARIANCE

SOURCE	SS	DF	MS	F	PROB
TREATMENT	342.8	5	68.563	157.979	.000
ERROR	10.42	24	.43400		
TOTAL	353.2	29			

OVERALL SIGNIFICANCE AT 5.% (ONE-TAILED) LEVEL

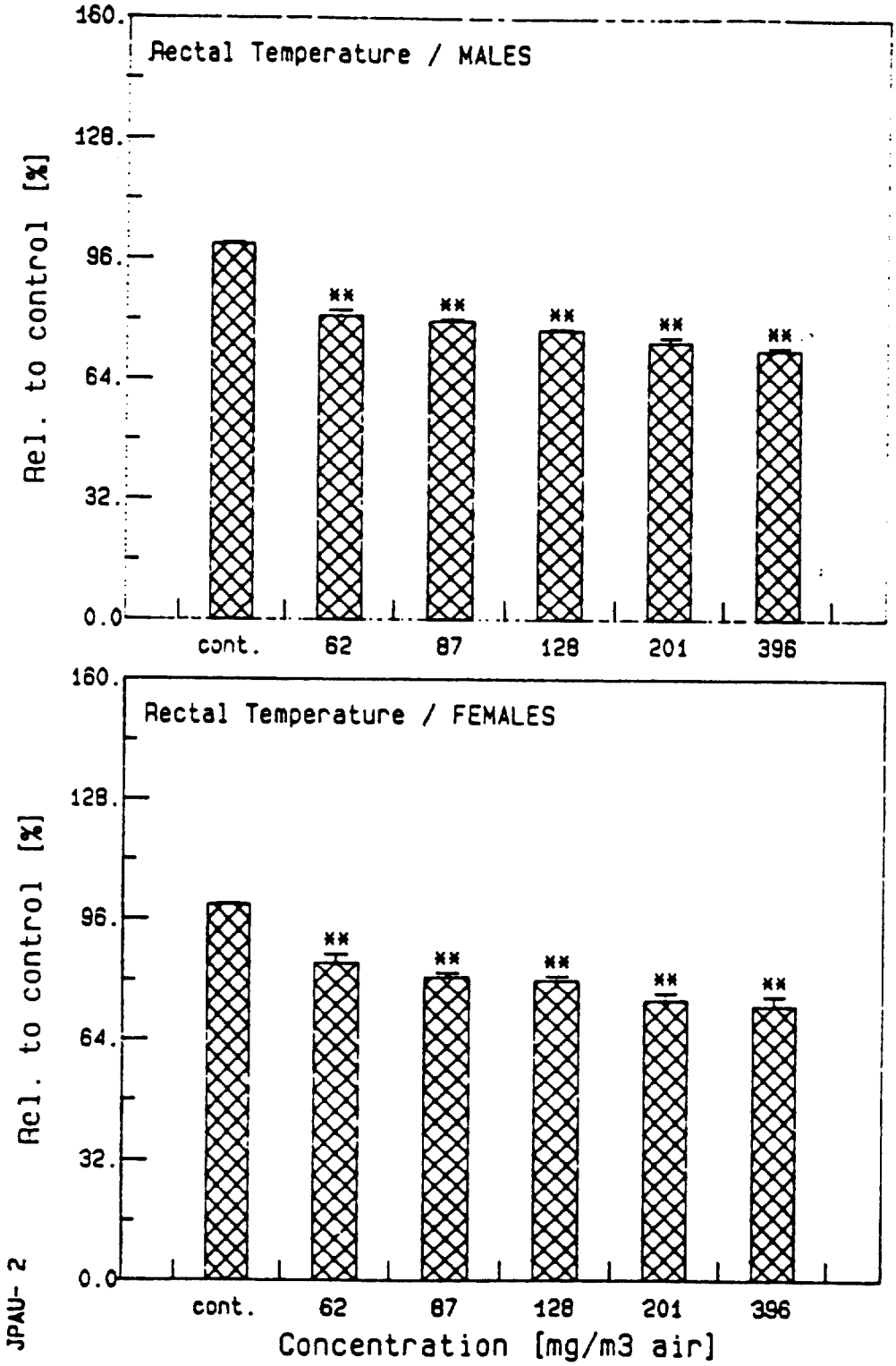
GAMES AND HOWELL MODIFICATION OF
TUKEY-KRAMER'S HONESTLY SIGNIFICANT DIFFERENCE TEST
(WITH THE STUDENTIZED RANGE STATISTIC)

GROUPS COMPARED	CALCULATED TEST VALUE	DEGREES OF FREEDOM	PROBABILITY	CONCLUSION
5. % ONE-TAILED TEST				
1 AND 2	-20.62	4	.0000	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 2	20.62	4	.0000	SIGNIFICANT
5. % ONE-TAILED TEST				
1 AND 3	-50.06	5	.0000	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 3	50.06	5	.0000	SIGNIFICANT
5. % ONE-TAILED TEST				
1 AND 4	-48.09	4	.0000	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 4	48.09	4	.0000	SIGNIFICANT
5. % ONE-TAILED TEST				
1 AND 5	-42.70	4	.0000	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 5	42.70	4	.0000	SIGNIFICANT
5. % ONE-TAILED TEST				
1 AND 6	-35.47	4	.0000	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 6	35.47	4	.0000	SIGNIFICANT
5. % ONE-TAILED TEST				
2 AND 3	-4.39	6	.1308	NOT SIGNIFICANT
5. % TWO-TAILED TEST				
2 AND 3	4.39	6	.1308	NOT SIGNIFICANT
5. % ONE-TAILED TEST				
2 AND 4	-5.35	6	.0618	NOT SIGNIFICANT
5. % TWO-TAILED TEST				
2 AND 4	5.35	6	.0618	NOT SIGNIFICANT
5. % ONE-TAILED TEST				
2 AND 5	-10.35	8	.0007	SIGNIFICANT
5. % TWO-TAILED TEST				

2 AND 5	10.35	8	.0007	SIGNIFICANT
5. % ONE-TAILED TEST				
2 AND 6	-10.70	8	.0005	SIGNIFICANT
5. % TWO-TAILED TEST				
2 AND 6	10.70	8	.0005	SIGNIFICANT
5. % ONE-TAILED TEST				
3 AND 4	-1.61	8	.8518	NOT SIGNIFICANT
5. % TWO-TAILED TEST				
3 AND 4	1.61	8	.8518	NOT SIGNIFICANT
5. % ONE-TAILED TEST				
3 AND 5	-8.89	7	.0034	SIGNIFICANT
5. % TWO-TAILED TEST				
3 AND 5	8.89	7	.0034	SIGNIFICANT
5. % ONE-TAILED TEST				
3 AND 6	-9.17	6	.0048	SIGNIFICANT
5. % TWO-TAILED TEST				
3 AND 6	9.17	6	.0048	SIGNIFICANT
5. % ONE-TAILED TEST				
4 AND 5	-7.40	7	.0098	SIGNIFICANT
5. % TWO-TAILED TEST				
4 AND 5	7.40	7	.0098	SIGNIFICANT
5. % ONE-TAILED TEST				
4 AND 6	-7.95	6	.0101	SIGNIFICANT
5. % TWO-TAILED TEST				
4 AND 6	7.95	6	.0101	SIGNIFICANT
5. % ONE-TAILED TEST				
5 AND 6	-1.59	8	.8587	NOT SIGNIFICANT
5. % TWO-TAILED TEST				
5 AND 6	1.59	8	.8587	NOT SIGNIFICANT

2-Chloracrylnitril

Study-no.: T9059294



JPAU- 2

Körpergewichte / body weights

I: Expositionstag / exposure day
II: 3. Nachbeobachtungstag / 3rd observation day
III: nach 1 Woche / after 1 week
IV: nach 2 Wochen / after 2 weeks
No.: Tier-Nummer / animal number

Konzentration/concentration: control
Gruppe/group: 1 - sex: MALE

No.	I	II	III	IV
1	189.0	198.0	214.0	239.0
2	186.0	192.0	211.0	233.0
3	192.0	210.0	224.0	284.0
4	191.0	196.0	213.0	251.0
5	187.0	202.0	232.0	281.0
MEAN	189.0	199.6	218.8	257.6
STD	2.5	6.8	8.9	23.7

Alle Gewichte in g / all weights in g

Konzentration/concentration: 61.8 mg/m³ air
Gruppe/group: 2 - sex: MALE

No.	I	II	III	IV
31	202.0	185.0	220.0	263.0
32	197.0	182.0	220.0	264.0
33	204.0	190.0	226.0	265.0
34	205.0	195.0	228.0	273.0
35	195.0	182.0	211.0	243.0
MEAN	200.6	186.8	221.0	261.6
STD	4.4	5.6	6.6	11.1

Alle Gewichte in g / all weights in g

Körpergewichte / body weights

I: Expositionstag / exposure day
II: 3. Nachbeobachtungstag / 3rd observation day
III: nach 1 Woche / after 1 week
IV: nach 2 Wochen / after 2 weeks
No.: Tier-Nummer / animal number

Konzentration/concentration: 87.1 mg/m³ air
Gruppe/group: 3 - sex: MALE

No.	I	II	III	IV
51	186.0	+	--	--
52	189.0	162.0	201.0	248.0
53	188.0	148.0	186.0	231.0
54	197.0	165.0	207.0	268.0
55	201.0	163.0	200.0	263.0
MEAN	192.2	159.5	198.5	252.5
STD	6.5	7.8	8.9	16.7

+ = Tier gestorben / animal died
Alle Gewichte in g / all weights in g

Konzentration/concentration: 127.9 mg/m³ air
Gruppe/group: 4 - sex: MALE

No.	I	II	III	IV
41	196.0	+	--	--
42	202.0	167.0	+	--
43	204.0	+	--	--
44	200.0	+	--	--
45	199.0	155.0	180.0	229.0
MEAN	200.2	161.0	180.0	229.0
STD	3.0	8.5	.0	.0

+ = Tier gestorben / animal died
Alle Gewichte in g / all weights in g

Körpergewichte / body weights

I: Expositionstag / exposure day
II: 3. Nachbeobachtungstag / 3rd observation day
III: nach 1 Woche / after 1 week
IV: nach 2 Wochen / after 2 weeks
No.: Tier-Nummer / animal number

Konzentration/concentration: 201.4 mg/m³ air
Gruppe/group: 5 - sex: MALE

No.	I	II	III	IV
21	197.0	+	--	--
22	186.0	+	--	--
23	202.0	+	--	--
24	185.0	149.0	175.0	223.0
25	193.0	+	--	--
MEAN	192.6	149.0	175.0	223.0
STD	7.2	.0	.0	.0

+ = Tier gestorben / animal died
Alle Gewichte in g / all weights in g

Konzentration/concentration: 395.7 mg/m³ air
Gruppe/group: 6 - sex: MALE

No.	I	II	III	IV
11	190.0	+	--	--
12	187.0	+	--	--
13	186.0	+	--	--
14	186.0	+	--	--
15	198.0	+	--	--
MEAN	189.4			
STD	5.1			

+ = Tier gestorben / animal died
Alle Gewichte in g / all weights in g

ONE-WAY ANALYSIS OF VARIANCE OF BODY WEIGHT GAIN

ANALYSIS OF B.W. DATA FOR MALE - OBSERVATION-No.: 1- 2

Group-No.: 1 / control
9.0 6.0 18.0 5.0 15.0
MEDIAN= 9.0 MEAN= 10.6 STD= 5.7

Group-No.: 2 / 61.8 mg/m³ air
-17.0 -15.0 -14.0 -10.0 -13.0
MEDIAN=-14.0 MEAN=-13.8 STD= 2.6

Group-No.: 3 / 87.1 mg/m³ air
-27.0 -40.0 -32.0 -38.0
MEDIAN=-35.0 MEAN=-34.3 STD= 5.9

Group-No.: 4 / 127.9 mg/m³ air
-35.0 -44.0
MEDIAN=-39.5 MEAN=-39.5 STD= 6.4

Group: 4 HAS LESS THAN 3 OBSERVATIONS,OMITTED FROM BOX'S TEST

BOX'S TEST FOR HOMOGENEITY OF VARIANCES AT P=.05000 LEVEL

CALCULATED F	D.F.'S	PROBABILITY
1.1839	2 & 261.	.3075

HOMOGENEOUS VARIANCES (ONE-TAILED TEST)

ONE-WAY CLASSIFICATION ANALYSIS OF VARIANCE

SOURCE	SS	DF	MS	F	PROB
TREATMENT	5963.	3	1987.6	79.173	.000
ERROR	301.3	12	25.104		
TOTAL	6264.	15			

OVERALL SIGNIFICANCE AT 5.% (ONE-TAILED) LEVEL

GAMES AND HOWELL MODIFICATION OF
TUKEY-KRAMER'S HONESTLY SIGNIFICANT DIFFERENCE TEST
(WITH THE STUDENTIZED RANGE STATISTIC)

GROUPS COMPARED	CALCULATED TEST VALUE	DEGREES OF FREEDOM	PROBABILITY	CONCLUSION
5. % ONE-TAILED TEST				
1 AND 2	-12.36	6	.0002	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 2	12.36	6	.0002	SIGNIFICANT
5. % ONE-TAILED TEST				
1 AND 3	-16.27	6	.0000	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 3	16.27	6	.0000	SIGNIFICANT
5. % ONE-TAILED TEST				
1 AND 4	-13.71	2	.0034	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 4	13.71	2	.0034	SIGNIFICANT
5. % ONE-TAILED TEST				
2 AND 3	-9.11	4	.0097	SIGNIFICANT
5. % TWO-TAILED TEST				
2 AND 3	9.11	4	.0097	SIGNIFICANT
5. % ONE-TAILED TEST				
2 AND 4	-7.82	1	.1887	NOT SIGNIFICANT
5. % TWO-TAILED TEST				
2 AND 4	7.82	1	.1887	NOT SIGNIFICANT
5. % ONE-TAILED TEST				
3 AND 4	-1.38	2	.7789	NOT SIGNIFICANT
5. % TWO-TAILED TEST				
3 AND 4	1.38	2	.7789	NOT SIGNIFICANT

ONE-WAY ANALYSIS OF VARIANCE OF BODY WEIGHT GAIN

ANALYSIS OF B.W. DATA FOR MALE - OBSERVATION-No.: 2- 3

Group-No.: 1 / control
16.0 19.0 14.0 17.0 30.0
MEDIAN= 17.0 MEAN= 19.2 STD= 6.3

Group-No.: 2 / 61.8 mg/m³ air
35.0 38.0 36.0 33.0 29.0
MEDIAN= 35.0 MEAN= 34.2 STD= 3.4

Group-No.: 3 / 87.1 mg/m³ air
39.0 38.0 42.0 37.0
MEDIAN= 38.5 MEAN= 39.0 STD= 2.2

BOX'S TEST FOR HOMOGENEITY OF VARIANCES AT P=.05000 LEVEL

CALCULATED F	D.F.'S	PROBABILITY
1.6777	2 & 261.	.1868

HOMOGENEOUS VARIANCES (ONE-TAILED TEST)

ONE-WAY CLASSIFICATION ANALYSIS OF VARIANCE

SOURCE	SS	DF	MS	F	PROB
TREATMENT	994.8	2	497.38	24.914	.000
ERROR	219.6	11	19.964		
TOTAL	1214.	13			

OVERALL SIGNIFICANCE AT 5.% (ONE-TAILED) LEVEL

GAMES AND HOWELL MODIFICATION OF
TUKEY-KRAMER'S HONESTLY SIGNIFICANT DIFFERENCE TEST
(WITH THE STUDENTIZED RANGE STATISTIC)

GROUPS COMPARED	CALCULATED TEST VALUE	DEGREES OF FREEDOM	PROBABILITY	CONCLUSION
5. % ONE-TAILED TEST				
1 AND 2	6.62	6	.0081	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 2	6.62	6	.0081	SIGNIFICANT
5. % ONE-TAILED TEST				
1 AND 3	9.28	5	.0027	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 3	9.28	5	.0027	SIGNIFICANT
5. % ONE-TAILED TEST				
2 AND 3	3.63	7	.0844	NOT SIGNIFICANT
5. % TWO-TAILED TEST				
2 AND 3	3.63	7	.0844	NOT SIGNIFICANT

ONE-WAY ANALYSIS OF VARIANCE OF BODY WEIGHT GAIN

ANALYSIS OF B.W. DATA FOR MALE - OBSERVATION-No.: 3- 4

Group-No.: 1 / control
25.0 22.0 60.0 38.0 49.0
MEDIAN= 38.0 MEAN= 38.8 STD= 16.0

Group-No.: 2 / 61.8 mg/m³ air
43.0 44.0 39.0 45.0 32.0
MEDIAN= 43.0 MEAN= 40.6 STD= 5.3

Group-No.: 3 / 87.1 mg/m³ air
47.0 45.0 61.0 63.0
MEDIAN= 54.0 MEAN= 54.0 STD= 9.3

BOX'S TEST FOR HOMOGENEITY OF VARIANCES AT P=.05000 LEVEL

CALCULATED F	D.F.'S	PROBABILITY
1.9560	2 & 261.	.1413

HOMOGENEOUS VARIANCES (ONE-TAILED TEST)

ONE-WAY CLASSIFICATION ANALYSIS OF VARIANCE

SOURCE	SS	DF	MS	F	PROB
TREATMENT	592.4	2	296.18	2.327	.143
ERROR	1400.	11	127.27		
TOTAL	1992.	13			

NO OVERALL SIGNIFICANCE AT 5.% (ONE-TAILED) LEVEL
NO STATISTICAL DIFFERENCE BETWEEN THE GROUPS

Körpergewichte / body weights

I: Expositionstag / exposure day
II: 3. Nachbeobachtungstag / 3rd observation day
III: nach 1 Woche / after 1 week
IV: nach 2 Wochen / after 2 weeks
No.: Tier-Nummer / animal number

Konzentration/concentration: control
Gruppe/group: 1 - sex: FEMALE

No.	I	II	III	IV
6	172.0	172.0	180.0	195.0
7	172.0	191.0	203.0	218.0
8	173.0	175.0	186.0	203.0
9	163.0	168.0	170.0	184.0
10	167.0	167.0	175.0	200.0
MEAN	169.4	174.6	182.8	200.0
STD	4.3	9.7	12.8	12.4

Alle Gewichte in g / all weights in g

Konzentration/concentration: 61.8 mg/m³ air
Gruppe/group: 2 - sex: FEMALE

No.	I	II	III	IV
36	173.0	162.0	170.0	172.0
37	177.0	165.0	175.0	182.0
38	173.0	162.0	171.0	183.0
39	167.0	159.0	180.0	186.0
40	172.0	154.0	163.0	174.0
MEAN	172.4	160.4	171.8	179.4
STD	3.6	4.2	6.3	6.1

Alle Gewichte in g / all weights in g

Körpergewichte / body weights

I: Expositionstag / exposure day
II: 3. Nachbeobachtungstag / 3rd observation day
III: nach 1 Woche / after 1 week
IV: nach 2 Wochen / after 2 weeks
No.: Tier-Nummer / animal number

Konzentration/concentration: 87.1 mg/m³ air
Gruppe/group: 3 - sex: FEMALE

No.	I	II	III	IV
56	180.0	+	--	--
57	173.0	154.0	175.0	196.0
58	175.0	+	--	--
59	173.0	142.0	159.0	180.0
60	175.0	159.0	178.0	202.0
MEAN	175.2	151.7	170.7	192.7
STD	2.9	8.7	10.2	11.4

+ = Tier gestorben / animal died
Alle Gewichte in g / all weights in g

Konzentration/concentration: 127.9 mg/m³ air
Gruppe/group: 4 - sex: FEMALE

No.	I	II	III	IV
46	184.0	137.0	+	--
47	176.0	+	--	--
48	182.0	+	--	--
49	173.0	+	--	--
50	173.0	+	--	--
MEAN	177.6	137.0		
STD	5.1	.0		

+ = Tier gestorben / animal died
Alle Gewichte in g / all weights in g

Körpergewichte / body weights

I: Expositionstag / exposure day
II: 3. Nachbeobachtungstag / 3rd observation day
III: nach 1 Woche / after 1 week
IV: nach 2 Wochen / after 2 weeks
No.: Tier-Nummer / animal number

Konzentration/concentration: 201.4 mg/m³ air
Gruppe/group: 5 - sex: FEMALE

No.	I	II	III	IV
26	193.0	+	--	--
27	180.0	+	--	--
28	175.0	+	--	--
29	186.0	+	--	--
30	176.0	+	--	--
MEAN	182.0			
STD	7.5			

+ = Tier gestorben / animal died
Alle Gewichte in g / all weights in g

Konzentration/concentration: 395.7 mg/m³ air
Gruppe/group: 6 - sex: FEMALE

No.	I	II	III	IV
16	177.0	+	--	--
17	180.0	+	--	--
18	179.0	+	--	--
19	175.0	+	--	--
20	175.0	+	--	--
MEAN	177.2			
STD	2.3			

+ = Tier gestorben / animal died
Alle Gewichte in g / all weights in g

ONE-WAY ANALYSIS OF VARIANCE OF BODY WEIGHT GAIN

ANALYSIS OF B.W. DATA FOR FEMALE- OBSERVATION-No.: 1- 2

Group-No.: 1 / control
.0 19.0 2.0 5.0 .0
MEDIAN= 2.0 MEAN= 5.2 STD= 8.0

Group-No.: 2 / 61.8 mg/m³ air
-11.0 -12.0 -11.0 -8.0 -18.0
MEDIAN=-11.0 MEAN=-12.0 STD= 3.7

Group-No.: 3 / 87.1 mg/m³ air
-19.0 -31.0 -16.0
MEDIAN=-19.0 MEAN=-22.0 STD= 7.9

BOX'S TEST FOR HOMOGENEITY OF VARIANCES AT P=.05000 LEVEL

CALCULATED F	D.F.'S	PROBABILITY
1.0497	2 & 178.	.3532

HOMOGENEOUS VARIANCES (ONE-TAILED TEST)

ONE-WAY CLASSIFICATION ANALYSIS OF VARIANCE

SOURCE	SS	DF	MS	F	PROB
TREATMENT	1538.	2	768.98	17.686	.001
ERROR	434.8	10	43.480		
TOTAL	1973.	12			

OVERALL SIGNIFICANCE AT 5.% (ONE-TAILED) LEVEL

GAMES AND HOWELL MODIFICATION OF
TUKEY-KRAMER'S HONESTLY SIGNIFICANT DIFFERENCE TEST
(WITH THE STUDENTIZED RANGE STATISTIC)

GROUPS COMPARED	CALCULATED TEST VALUE	DEGREES OF FREEDOM	PROBABILITY	CONCLUSION
5. % ONE-TAILED TEST				
1 AND 2	-6.19	6	.0111	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 2	6.19	6	.0111	SIGNIFICANT
5. % ONE-TAILED TEST				
1 AND 3	-6.62	4	.0205	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 3	6.62	4	.0205	SIGNIFICANT
5. % ONE-TAILED TEST				
2 AND 3	-2.90	3	.2467	NOT SIGNIFICANT
5. % TWO-TAILED TEST				
2 AND 3	2.90	3	.2467	NOT SIGNIFICANT

ONE-WAY ANALYSIS OF VARIANCE OF BODY WEIGHT GAIN

ANALYSIS OF B.W. DATA FOR FEMALE- OBSERVATION-No.: 2- 3

Group-No.: 1 / control
8.0 12.0 11.0 2.0 8.0
MEDIAN= 8.0 MEAN= 8.2 STD= 3.9

Group-No.: 2 / 61.8 mg/m³ air
8.0 10.0 9.0 21.0 9.0
MEDIAN= 9.0 MEAN= 11.4 STD= 5.4

Group-No.: 3 / 87.1 mg/m³ air
21.0 17.0 19.0
MEDIAN= 19.0 MEAN= 19.0 STD= 2.0

BOX'S TEST FOR HOMOGENEITY OF VARIANCES AT P=.05000 LEVEL

CALCULATED F	D.F.'S	PROBABILITY
.8976	2 & 178.	.5879

HOMOGENEOUS VARIANCES (ONE-TAILED TEST)

ONE-WAY CLASSIFICATION ANALYSIS OF VARIANCE

SOURCE	SS	DF	MS	F	PROB
TREATMENT	220.9	2	110.46	5.939	.020
ERROR	186.0	10	18.600		
TOTAL	406.9	12			

OVERALL SIGNIFICANCE AT 5.% (ONE-TAILED) LEVEL

GAMES AND HOWELL MODIFICATION OF
TUKEY-KRAMER'S HONESTLY SIGNIFICANT DIFFERENCE TEST
(WITH THE STUDENTIZED RANGE STATISTIC)

GROUPS COMPARED	CALCULATED TEST VALUE	DEGREES OF FREEDOM	PROBABILITY	CONCLUSION
5. % ONE-TAILED TEST				
1 AND 2	1.52	7	.5590	NOT SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 2	1.52	7	.5590	NOT SIGNIFICANT
5. % ONE-TAILED TEST				
1 AND 3	7.30	6	.0050	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 3	7.30	6	.0050	SIGNIFICANT
5. % ONE-TAILED TEST				
2 AND 3	4.01	5	.0793	NOT SIGNIFICANT
5. % TWO-TAILED TEST				
2 AND 3	4.01	5	.0793	NOT SIGNIFICANT

ONE-WAY ANALYSIS OF VARIANCE OF BODY WEIGHT GAIN

ANALYSIS OF B.W. DATA FOR FEMALE- OBSERVATION-No.: 3- 4

Group-No.: 1 / control
15.0 15.0 17.0 14.0 25.0
MEDIAN= 15.0 MEAN= 17.2 STD= 4.5

Group-No.: 2 / 61.8 mg/m³ air
2.0 7.0 12.0 6.0 11.0
MEDIAN= 7.0 MEAN= 7.6 STD= 4.0

Group-No.: 3 / 87.1 mg/m³ air
21.0 21.0 24.0
MEDIAN= 21.0 MEAN= 22.0 STD= 1.7

BOX'S TEST FOR HOMOGENEITY OF VARIANCES AT P=.05000 LEVEL

CALCULATED F	D.F.'S	PROBABILITY
.7944	2 & 178.	.5427

HOMOGENEOUS VARIANCES (ONE-TAILED TEST)

ONE-WAY CLASSIFICATION ANALYSIS OF VARIANCE

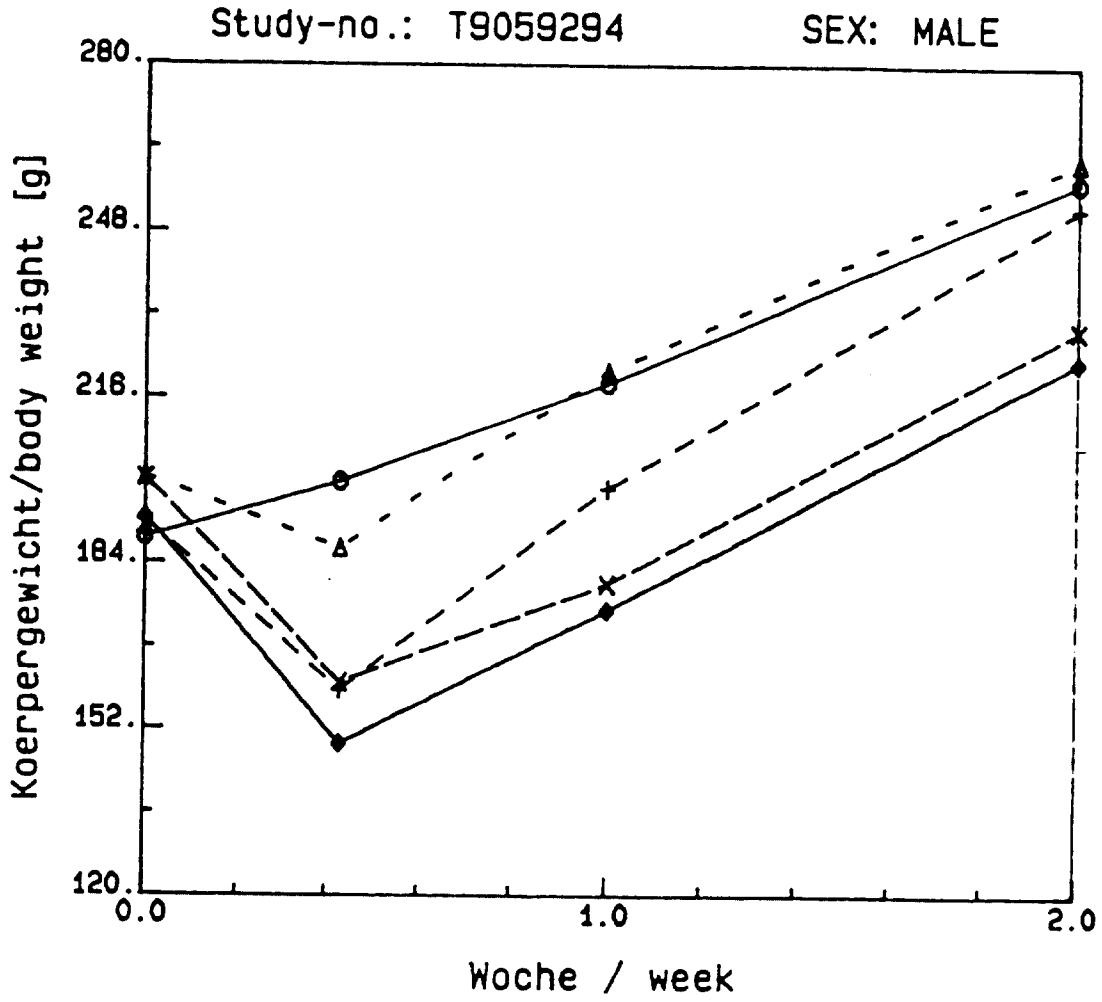
SOURCE	SS	DF	MS	F	PROB
TREATMENT	443.1	2	221.54	14.575	.001
ERROR	152.0	10	15.200		
TOTAL	595.1	12			

OVERALL SIGNIFICANCE AT 5.% (ONE-TAILED) LEVEL

GAMES AND HOWELL MODIFICATION OF
TUKEY-KRAMER'S HONESTLY SIGNIFICANT DIFFERENCE TEST
(WITH THE STUDENTIZED RANGE STATISTIC)

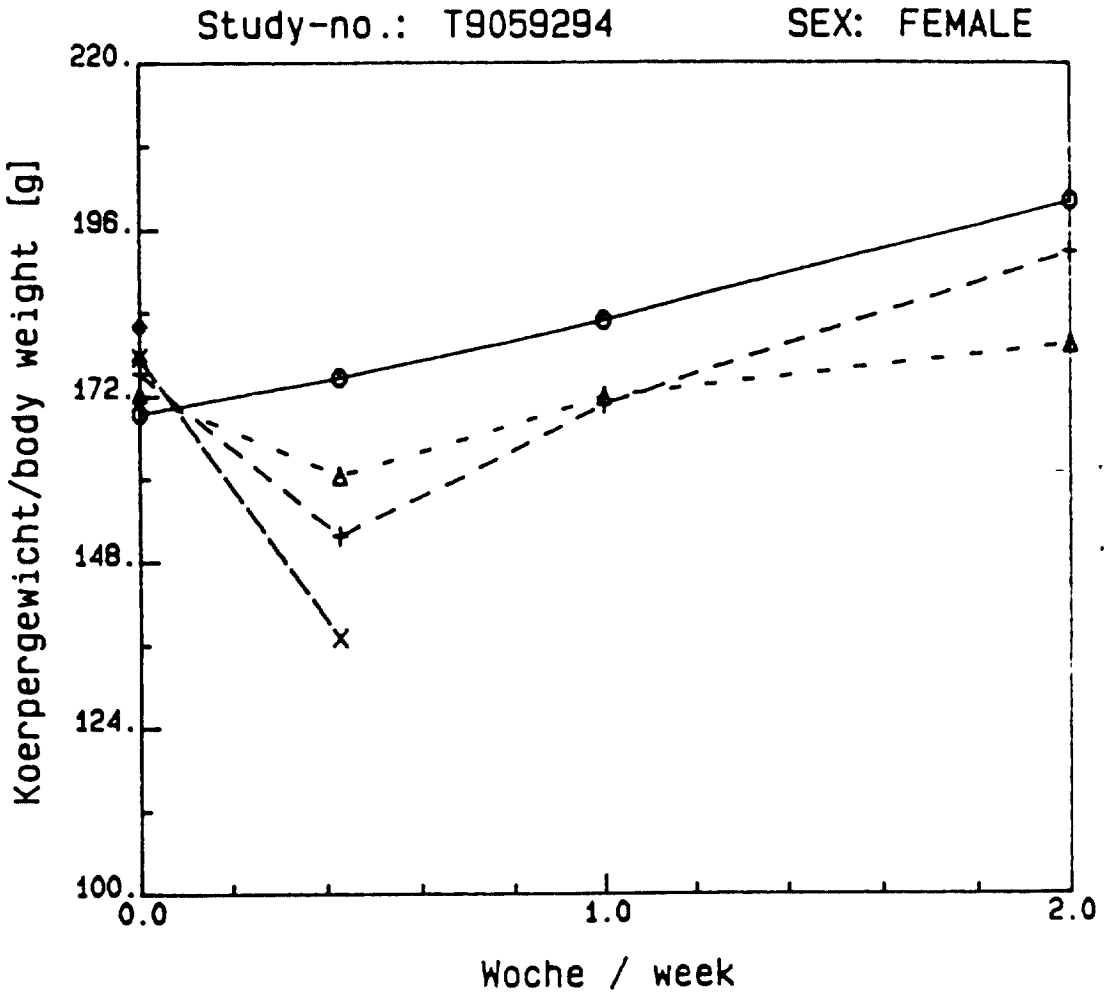
GROUPS COMPARED	CALCULATED TEST VALUE	DEGREES OF FREEDOM	PROBABILITY	CONCLUSION
5. % ONE-TAILED TEST				
1 AND 2	-5.02	8	.0183	SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 2	5.02	8	.0183	SIGNIFICANT
5. % ONE-TAILED TEST				
1 AND 3	3.02	6	.1620	NOT SIGNIFICANT
5. % TWO-TAILED TEST				
1 AND 3	3.02	6	.1620	NOT SIGNIFICANT
5. % ONE-TAILED TEST				
2 AND 3	9.87	6	.0009	SIGNIFICANT
5. % TWO-TAILED TEST				
2 AND 3	9.87	6	.0009	SIGNIFICANT

2-Chloracrylnitril



- ⊙ group: 1
- △ group: 2
- + group: 3
- × group: 4
- ◆ group: 5
- ✦ group: 6

2-Chloracrylnitril



- ⊖ group: 1
- ▲ group: 2
- + group: 3
- × group: 4
- ♦ group: 5
- ♦ group: 6

Gross Pathology Report

Individual findings / male rats

Group	Animal No.	Time of death	Sacrificed after	Pathology findings
1	1		14 d	lung: gray-red
	2		14 d	no observable findings
	3		14 d	no observable findings
	4		14 d	lung: gray-red
	5		14 d	no observable findings
2	31		14 d	lung: gray-red foci
	32		14 d	no observable findings
	33		14 d	no observable findings
	34		14 d	no observable findings
	35		14 d	no observable findings
3	51	3 d		lung: distended, red
				small intestine: reddish mucous
				mucosa: reddening
				spleen: pale
	52		14 d	lung: foci dark red - gray
	53		14 d	no observable findings
	54		14 d	no observable findings
	55		14 d	no observable findings
4	41	2 d		snout: red incrustations
				lung: distended, foci dark red
	42	5 d		lung: distended, pale, foci dark red
	43	1 d		snout: red incrusted
				pleura: fluid colorless approx. 0.1 ml
				lung: areas dark red
				liver: distinct lobulation
				spleen: pale
				kidneys: bilateral pale
				renal pelvis: bilateral reddening
	44	3 d		lung: distended, foci dark red
	45		14 d	lung: areas dark red

distended: lung did not collapse during opening of thoracic cavity

Group	Animal No.	Time of death	Sacrificed after	Pathology findings
5	21	1 d		**snout**: red incrusted **lung**: distended, areas marked dark red
	22	2 d		**lung**: distended, areas marked dark red **liver**: distinct lobulation
	23	1 d		**lung**: distended, foci marked dark red
	24		14 d	**lung**: areas dark red
	25	1 d		**lung**: distended, foci marked dark red
6	11	1 d		**snout**: red incrusted **lung**: distended, areas marked dark red
	12	1 d		**snout**: red incrusted **lung**: distended, areas marked dark red **trachea**: foamy white content **liver**: distinct lobulation
	13	2 d		**snout**: red incrusted **lung**: distended, areas marked dark red **liver**: distinct lobulation
	14	1 d		**snout**: red incrusted **lung**: distended, areas marked dark red **liver**: distinct lobulation
	15	1 d		**snout**: red incrusted **lung**: distended, foci dark red

distended: lung did not collapse during opening of thoracic cavity

Individual findings / female rats

Group	Animal No.	Time of death	Sacrificed after	Pathology findings
1	6		14 d	no observable findings
	7		14 d	lung: foci gray-red
	8		14 d	lung: foci marked gray-red
	9		14 d	lung: foci dark red
	10		14 d	lung: foci marked gray-red
2	36		14 d	no observable findings
	37		14 d	lung: foci dark red
	38		14 d	no observable findings
	39		14 d	no observable findings
	40		14 d	no observable findings
3	56	3 d		lung: distended, dark red spleen: pale
	57		14 d	no observable findings
	58	1 d		lung: marked distended, gray-red trachea: reddening small intestine: red mucous mucosa: reddening
	59		14 d	lung: foci marked gray-red
	60		14 d	lung: foci marked dark-red
4	46	4 d		lung: distended, areas marked dark red
	47	1 d		snout: red incrusted lung: distended, dark red small intestine: chg. in contents yellow-mucous; mucosa: reddening liver: distinct lobulation renal pelvis: reddening
	48	2 d		lung: distended, areas marked dark red liver: distinct lobulation
	49	1 d		lung: distended, foci dark red small intestine: mucosa: light reddening lung: distended, dark red liver: lobulation
	50	2 d		snout: red incrusted lung: distended, areas dark red liver: distinct lobulation

Group	Animal No.	Time of death	Sacrificed after	Pathology findings
5	26	2 d		snout: red incrusted lung distended, areas marked dark red liver: distinct lobulation
	27	1 d		snout: red incrusted lung: distended, areas marked dark red
	28	1 d		snout: red incrusted lung: distended, areas marked dark red liver: distinct lobulation
	29	2 d		snout: red incrusted lung: distended, areas marked dark red liver: distinct lobulation
	30	2 d		snout: red incrusted lung distended, foci marked dark red liver: distinct lobulation
6	16	2 d		snout: red incrusted lung: distended, areas dark red liver: distinct lobulation
	17	1 d		snout: red incrusted lung: distended, areas marked dark red liver: distinct lobulation
	18	2 d		snout: red incrusted lung: distended, areas marked dark red liver: distinct lobulation kidneys: bilateral pale
	19	2 d		snout: red incrusted lung: distended, areas marked dark red
	20	1 d		snout: red incrusted lung: distended, foci dark red liver: distinct lobulation

Lungs MALES with colour changes

R X C CHI-SQUARE - TEST:

Chisquare =	4.267	DF = 4	Frequency =	.375
Chi-Tab. =	9.488	p = 0.05 (bilateral)		

FISHERs EXACT TEST:

Group: 1		Incidence:	2/ 5	B	U
Group: 2	P= .9167	Incidence:	1/ 5	-	-
Group: 3	P= .8810	Incidence:	1/ 4	-	-
Group: 4	P= .6333	Incidence:	1/ 1	-	-
Group: 5	P= .6333	Incidence:	1/ 1	-	-

B = bilateral comparison of groups
U = unilateral comparison of groups
P = single-tailed probability

#/# = 1st figure: number of positive observations
2nd figure: number of total observations in surviving animals

Lungs FEMALES with colour changes

R X C CHI-SQUARE - TEST:

Chisquare =	3.879	DF = 2	Frequency =	1.615
Chi-Tab. =	5.991	p = 0.05 (bilateral)		

FISHERs EXACT TEST:

Group: 1		Incidence:	4/ 5	B	U
Group: 2	P= .9960	Incidence:	1/ 5	-	-
Group: 3	P= .9914	Incidence:	2/ 3	-	-

B = bilateral comparison of groups
U = unilateral comparison of groups
P = single-tailed probability

#/# = 1st figure: number of positive observations
2nd figure: number of total observations in surviving animals

Chow Specification - Nutrients

Altromin Standard Diets 1320 / Totally Pathogene Free TPF®

ALTROMIN 1320 Rat & Mouse Maintenance Diet has now been successfully used for in excess of 30 years and is normally fed to animals aged 8 weeks or over. The diet should be offered ad libitum together with an ample supply of fresh water. Sealed in polyethylene lined sacks, ALTROMIN 1320 can be passed directly into the SPF facility following surface disinfection. ALTROMIN 1324 consists of 10.0 mm pellets.

Specification of Maintenance Diet Rats/Mice

Nutrients (average % content in the diet)	
Crude protein	19.0
Crude fat	4.0
Crude fiber	6.0
Ash	7.0
Moisture	13.5
Nitrogen-free extract	50.5
Metabolizable Energy (calculated)	
Kcal/kg	2850.0
MJ/kg	11.9

Minerals (average % content in the diet)	
Calcium	0.9
Phosphorus	0.7
Magnesium	0.2
Sodium	0.2
Potassium	1.0

Amino Acids (average % content in the diet)	
Lysine	0.90
Methionine	0.30
Cystine	0.30
Phenylalanine	0.80
Tyrosine	0.60
Arginine	1.10
Histidine	0.40
Tryptophane	0.20
Threonine	0.60
Isoleucine	0.80
Leucine	1.30
Valine	0.90

Trace elements (average mg content in 1 kg diet)	
Manganese	75.0
Iron	180.0
Copper	5.0
Zinc	70.0
Iodine	0.9
Fluorine	15.0

Vitamins (additive in 1 kg diet)	Standard-Diet	Standard-Diet fortified
Vitamin A	15000.0 IU	25000.0 IU
Vitamin D_3	600.0 IU	1000.0 IU
Vitamin E	75.0 mg	125.0 mg
Vitamin K_3	3.0 mg	5.0 mg
Vitamin B_1	18.0 mg	30.0 mg
Vitamin B_2	12.0 mg	20.0 mg
Vitamin B_6	9.0 mg	15.0 mg
Vitamin B_{12}	24.0 mcg	40.0 mcg
Nicotinic acid	36.0 mg	60.0 mg
Pantothenic acid	21.0 mg	35.0 mg
Folic acid	2.0 mg	3.0 mg
Biotin	60.0 mcg	100.0 mcg
Choline	600.0 mg	1000.0 mg
Vitamin C	36.0 mg	60.0 mg

Chow Specification - Impurities

Impurity	Max. acceptable value	LUFA - Limit of detection	Altromin *
Aflatoxine B_1 / B_2	0.01	0.0025	nng
Aflatoxine G_1 / G_2	0.01	0.0025	nng
Antibiotic activity	± 0		nng
Arsenic	2.0	0.2	0.3
Fluoride	150.0	5.0	22.0
Mercury	0.1	0.01	0.08
Lead	5.0	0.1	0.37
Cadmium		0.01	0.10
Selenium		0.10	1.0
Tecnazene		0.001	< 0.001
Quintozene		0.001	< 0.001
HCB (Hexachlorbenzene)		0.001	< 0.001
α -HCH		0.001	< 0.001
β -HCH		0.002	< 0.002
τ -HCH	0.1	0.001	0.002
Heptachlor	0.03	0.005	< 0.005
Heptachlorepoxid	0.03	0.005	< 0.005
α - Chlordan	0.05	0.005	< 0.005
τ - Chlordan	0.05	0.005	< 0.005
Aldrin	0.02	0.005	< 0.005
Dieldrin	0.02	0.005	< 0.005
Endrin	0.02	0.01	< 0.01
o,p - DDE	0.05	0.005	< 0.005
p,p - DDE	0.05	0.005	< 0.005
o,p - DDD	0.05	0.005	< 0.005
o,p - DDT	0.05	0.005	< 0.005
p,p - DDD	0.05	0.01	< 0.01
p,p - DDT	0.05	0.01	< 0.01
Methoxychlor		0.01	< 0.01
PCB qual.			nng
Chlorthion		0.01	< 0.01
Disulfothion		0.005	< 0.005
Malathion		0.01	< 0.01
Methylparathion		0.005	< 0.005
Ethylparathion		0.01	< 0.01
Sulfotepp		0.002	< 0.002
Fenthion		0.005	< 0.005
Diazinon		0.01	< 0.01
Dibrom		0.02	< 0.02
Dimethoate		0.005	< 0.005
Trichlorphon		0.01	< 0.01
Fenitrothion		0.01	< 0.01

* In this study Altromin 1324 was used. 4 is the degree of pelletation. Dimension: ppm

Tap Water Specification

No.	Substance	Limit mg/l	computed as	equivalent mmol/m³	acceptable error of value (± mg/l)
1	Arsenic	0.04	As	0.5	0.015
2	Lead	0.04	Pb	0.2	0.02
3	Cadmium	0.005	Cd	0.04	0.002
4	Chrome	0.05	Cr	1	0.01
5	Cyanide	0.05	CN-	2	0.01
6	Fluoride	1.5	F-	79	0.2
7	Nickel	0.05	Ni	0.9	0.01
8	Nitrate	50	NO_3^-	806	2
9	Nitrite	0.1	NO_2^-	2.2	0.02
10	Mercury	0.001	Hg	0.005	0.0005
11	Polycyclic aromatic carbohyrates - Fluoranthene - Benzo-b-fluoranthene - Benzo-k-fluoranthene - Benzo-a-pyrene - Benzo-(ghi)-perylene - Indeno-(1,2,3-cd)-pyrene	sum 0.0002	C	0.02	0.00004
12	Organochlorine compounds - 1,1,1-Trichlorethane - Trichlorethylene - Tetrachlorethylene - Dichlormethane	sum 0.01	-	-	0.004
	- Tetrachlormethane	0.003	CCl4	0.02	0.001
13	a. Pesticides	indiv-dual com-pound 0.0001	-	-	0.00005
	b. Polychlorinated Polybromated biphenyles and terphenyles	sum 0.0005	-	-	0.0002
14	Antimony	0.01	Sb	0.08	0.002
15	Selenium	0.01	Se	0.13	0.002

Specification of Test Compound

G L P - A b s c h l u ß b e r i c h t Seite 1 von 2

IDENTITÄTSPRÜFUNG

BAYER AG ZF-Forschungsdienste Gebäude Q 18 51368 Leverkusen	Datum : 21.Mär.1995 Studiennummer: A 95/0023/00 LEV Prüfleiter : Dr.Seelemann Vertreter : Dr.Hamm

Prüfsubstanz: 2-Chloracrylnitril

Auftraggeber: Dr.Paetz, BALK, LEV, Gebäude D 8 Auftragsnummer: 95/008

Chemische Bezeichnung : 2-Chloracrylnitril

Summenformel	: C_3H_2ClN	Molare Masse	: 87,5 g/mol
CAS-Nr.	: 920-37-6	Charge/Partie-Nr.	: A 005
Proben-Nr./Jahr	: 828084/1995	Datum Probenabholung	: 13.03.95
Herstellbetrieb	: OC ZeTO	Herstelldatum	: 10.03.95
Produkt-Nr.	: 840165-01	Haltbarkeit bis	: 13.09.95

Beginn der Prüfung : 16.03.95
Ende der Prüfung : 21.03.95

1. Beschreibung der Methoden und Einzelergebnisse

1.1 Prüfung : Identitätsprüfung (IR)
SOP : D 0085601 DZA
Betreuer : Dr.Seelemann
Ergebnis : Identität entspricht
Beschreibung der Methode:
Von einem kleinen Teil der Probensubstanz wird ein Film zwischen zwei Kaliumbromidfenstern hergestellt.
Von dieser Probe wird ein hochaufgelöstes FTIR-Spektrum aufgenommen und ausgewertet.

2. Bewertung und Kommentar

- Identität wurde durch Spektrenvergleich festgestellt.

3. Archivierung von Aufzeichnungen

GLP-Archiv, Bayer AG, ZF-D Zentrale Analytik Leverkusen, Gebäude O 13, 51368 Leverkusen

Prüfplan, Rohdaten, Abschluß- und Inspektionsberichte sowie weitere für eine Nachprüfung relevante Unterlagen werden archiviert.

G L P - A b s c h l u ß b e r i c h t

IDENTITÄTSPRÜFUNG

BAYER AG
ZF-Forschungsdienste
Gebäude Q 18
51368 Leverkusen

Datum : 21.Mär.1995
Studiennummer: A 95/0023/00 LEV
Prüfleiter : Dr.Seelemann
Vertreter : Dr.Hamm

Prüfsubstanz: 2-Chloracrylnitril

Auftraggeber: Dr.Paetz, BALK, LEV, Gebäude D 8 Auftragsnummer: 95/008

4. **Archivierung des Rückstellmusters**

GLP-Probenlager, Bayer AG, ZF-D Zentrale Analytik Leverkusen, Gebäude O 13, 51368 Leverkusen

5. **Erklärung des Prüfleiters**

Die Untersuchungen wurden in Übereinstimmung mit den OECD-Grundsätzen der Guten Laborpraxis (GLP) vom 04.02.83 (veröffentlicht im Bundesanzeiger Nr.42a vom 02.03.83) und den Grundsätzen der Guten Laborpraxis (GLP) gemäß Anhang 1 des Gesetzes zum Schutz vor gefährlichen Stoffen (Chemikaliengesetz) vom 25.07.1994 (veröffentlicht im Bundesgesetzblatt, Teil I vom 29.07.1994) durchgeführt.

in Vertretung

Prüfleiter: 21.03.95 Ha

(Datum) (Dr.Seelemann)

Anlagen: Erklärung der Qualitätssicherungseinheit

Bayer AG
ZF-DZA Analytik Leverkusen/OAL
Gebäude O 13
51368 Leverkusen

Qualitätssicherungserklärung zum Abschlußbericht

Studien-Nr. bzw. Auftrag-Nr.: A 95/0023/00 LEV

Titel der GLP-Untersuchung : 2-Chloracrylnitril

Art der Studie: Identität

Diese GLP-Untersuchung wurde durch die Qualitätssicherung überprüft. Die Zeitpunkte der Inspektionen und die Zeitpunkte der Berichte an den Leiter der Prüfeinrichtung und an den Prüfleiter sind nachfolgend aufgeführt:

Überprüfung (Datum)	Bericht (Datum)
14.03.95	14.03.95
24.03.95	24.03.95

Die im Abschlußbericht dieser Untersuchung wiedergegebenen Ergebnisse werden auf der Basis der aktuellen SOP,'s/Analysenmethoden überprüft. Sie entsprechen nach unserem besten Wissen den vorliegenden Rohdaten.

Qualitätssicherung:

24.03.95
(Datum)

Dittrich
(Dr. Dittrich)

Zu OC 007/95

G L P - A b s c h l u ß b e r i c h t Seite 1 von 3

ANALYTISCHE STOFFBILANZ

BAYER AG
ZF-Forschungsdienste
Gebäude Q 18
51368 Leverkusen

Datum : 31.Mär.1995
Studiennummer: A 95/0023/01 LEV
Prüfleiter : Hr.Malzer
Vertreter : Dr.Neupert

Prüfsubstanz: 2-Chloracrylnitril

Auftraggeber: Dr.Paetz, BALK, LEV, Gebäude D 8 Auftragsnummer: 95/008

Chemische Bezeichnung : 2-Chloracrylnitril

Summenformel	: C_3H_2ClN	Molare Masse	: 87,5 g/mol
CAS-Nr.	: 920-37-6	Charge/Partie-Nr.	: A 005
Proben-Nr./Jahr	: 828084/1995	Datum Probenabholung	: 13.03.95
Herstellbetrieb	: OC ZeTO	Herstelldatum	: 10.03.95
Produkt-Nr.	: 840165-01	Haltbarkeit bis	: 13.09.95

Beginn der Prüfung : 24.03.95
Ende der Prüfung : 31.03.95

1. Beschreibung der Methoden und Einzelergebnisse

1.1 Prüfungen auf Einhaltung der Spezifikation und weitere Untersuchungen zur Bilanzierung
Spezifikation vom : --
Spezifikationswerte : --

1.1.1 Prüfung : Gehalt und Nebenkomponenten (GC)
Methoden-Nr.: 2011-0482701-95D
Betreuer : Hr.Malzer
Ergebnis :

99,1 % 2-Chloracrylnitril
0,6 % 2,3-Dichlorpropionitril
0,2 % unbekannte Verbindungen
5 Komponenten

Ø Dr. Pinkert

Beschreibung der Methode: Gaschromatographie

Trennsäule	: Quarzkapillare	Filmdicke:	0,25 µm
Stationäre Phase	: SE 30, Innen-ø: 0,32 mm	Länge:	25 m
Trägergas	: Helium	Druck:	0,5 bar

Temperaturprogramm: 40 °C (2 min) - 5 °C/min - 60 °C (0 min)
- 20 °C/min - 250 °C (4 min)
Detektor : Flammenionisationsdetektor
Probenaufgabe : Splitinjektion

Die Quantifizierung erfolgt durch Flächennormierung unter Berücksichtigung von Wasser, unverdampfbaren Anteilen und Hydrochinon-monomethylether.

G L P - A b s c h l u ß b e r i c h t

ANALYTISCHE STOFFBILANZ

BAYER AG ZF-Forschungsdienste Gebäude Q 18 51368 Leverkusen	Datum : 31.Mär.1995 Studiennummer: A 95/0023/01 LEV Prüfleiter : Hr.Malzer Vertreter : Dr.Neupert

Prüfsubstanz: 2-Chloracrylnitril

Auftraggeber: Dr.Paetz, BALK, LEV, Gebäude D 8 Auftragsnummer: 95/008

1.1.2 Prüfung : Gehalt Hydrochinonmonomethylether (GC)
Methoden-Nr.: 2011-0474201-94D
Betreuer : Hr.Malzer
Ergebnis : 1100 mg/kg

Beschreibung der Methode: Gaschromatographie

Trennsäule	: Quarzkapillare	Filmdicke:	0,25 µm
Stationäre Phase	: SE 30, Innen-ø: 0,32 mm	Länge:	25 m
Trägergas	: Helium	Druck:	0,4 bar

Temperaturprogramm: 60 °C(5 min) - 10 °C/min - 300 °C
Detektor : Flammenionisationsdetektor
Probenaufgabe : Splitinjektion

Die Quantifizierung erfolgt nach der Methode des externen Standard.

1.1.3 Prüfung : Wasser n. K.F.
Methoden-Nr.: 2011-0131301-90D
2011-0131401-90D
Betreuer : Dr.Diehl
Ergebnis : 0,01 %

Beschreibung der Methode: Die Probe wird in K.F.-Solvent oder in einem geeigneten Solvent-Lösemittelgemisch gelöst und mit K.F.-Titrant gegen eine Pt-Indikator-Elektrode biamperometrisch titriert. K.F.-Solvent und K.F.-Titrant sind käufliche Reagenzien zur Wasserbestimmung (z.B. Riedel de Haen).

1.1.4 Prüfung : Unverdampfbarer Probenanteil
Methoden-Nr.: 2011-0347001-92D
Betreuer : Dr.Diehl
Ergebnis : <0,01 %

Beschreibung der Methode: Die Probe wird in einem tarierten Rundkolben mit Normschliff eingewogen und nach langsamem Erhitzen in einem Büchi-Kugelrohrdestillationsofen bis zur Gewichtskonstanz behandelt.
Bedingungen : 10 min. bei 75°C und 30 min. bei 120°C, bei 0,025 mbar

G L P - A b s c h l u ß b e r i c h t

ANALYTISCHE STOFFBILANZ

BAYER AG ZF-Forschungsdienste Gebäude Q 18 51368 Leverkusen	Datum : 31.Mär.1995 Studiennummer: A 95/0023/01 LEV Prüfleiter : Hr.Malzer Vertreter : Dr.Neupert

Prüfsubstanz: 2-Chloracrylnitril

Auftraggeber: Dr.Paetz, BALK, LEV, Gebäude D 8 Auftragsnummer: 95/008

1.2 Bilanzierung

99,1	% 2-Chloracrylnitril
0,6	% 2,3-Dichlorpropionitril
0,2	% unbekannte Verbindungen
0,11	% Hydochinonmonomethylether
0,01	% Wasser
100,0	%

2. Bewertung und Kommentar

- Stoffbilanz ist nach Stand der Technik vollständig

3. Archivierung von Aufzeichnungen

GLP-Archiv, Bayer AG, ZF-D Zentrale Analytik Leverkusen, Gebäude O 13, 51368 Leverkusen

Prüfplan, Rohdaten, Abschluß- und Inspektionsberichte sowie weitere für eine Nachprüfung relevante Unterlagen werden archiviert.

4. Archivierung des Rückstellmusters

GLP-Probenlager, Bayer AG, ZF-D Zentrale Analytik Leverkusen, Gebäude O 13, 51368 Leverkusen

5. Erklärung des Prüfleiters

Die Untersuchungen wurden in Übereinstimmung mit den OECD-Grundsätzen der Guten Laborpraxis (GLP) vom 04.02.83 (veröffentlicht im Bundesanzeiger Nr.42a vom 02.03.83) und den Grundsätzen der Guten Laborpraxis (GLP) gemäß Anhang 1 des Gesetzes zum Schutz vor gefährlichen Stoffen (Chemikaliengesetz) vom 25.07.1994 (veröffentlicht im Bundesgesetzblatt, Teil I vom 29.07.1994) durchgeführt.

Prüfleiter: 31.3.95 Malzer
(Datum)

Anlagen: Erklärung der Qualitätssicherungseinheit

Bayer AG
ZF-DZA Analytik Leverkusen/OAL
Gebäude O 13
51368 Leverkusen

Qualitätssicherungserklärung zum Abschlußbericht

Studien-Nr. bzw. Auftrag-Nr.: A 95/0023/01 LEV

Titel der GLP-Untersuchung : 2-Chloracrylnitril

Art der Studie: Charakterisierung/Stoffbilanz

Diese GLP-Untersuchung wurde durch die Qualitätssicherung überprüft. Die Zeitpunkte der Inspektionen und die Zeitpunkte der Berichte an den Leiter der Prüfeinrichtung und an den Prüfleiter sind nachfolgend aufgeführt:

Überprüfung (Datum)	Bericht (Datum)
24.03.95	24.03.95
07.04.95	07.04.95

Die im Abschlußbericht dieser Untersuchung wiedergegebenen Ergebnisse werden auf der Basis der aktuellen SOP,'s/Analysenmethoden überprüft. Sie entsprechen nach unserem besten Wissen den vorliegenden Rohdaten.

Qualitätssicherung:

07.04.95
(Datum)

(Dr. Dittrich)

Appendix - Analytical Characterization of Test Atmosphere

BAYER AG
PH-PD TOXICOLOGY
FRIEDRICH-EBERT-STR. 217-333
D-42096 WUPPERTAL

2-CHLORACRYLNITRIL

ANALYTICAL METHOD VALIDATION FOR

CONCENTRATION DETERMINATIONS IN TEST ATMOSPHERES

Analytic Report

Dr. W. Rüngeler

Study-No.: T9059294

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2. SUMMARY

An analytical method is described which can be used to determine the test material concentrations of 2-CHLORACRYLNITRIL in test atmospheres.
This method was developed to quantify the test material. The test atmosphere vapor was absorbed in impinger flask filled with toluene. After complete absorption in toluene it was quantified analytically by gas chromatography (GC) using an electron capture detector (ECD). Standard solutions of approved test material were used as a basis for evaluation.

With a 10 litre atmosphere samples and end solution volumes of 50 ml, the limits of quantification for this test substance have been found to be **0.138 mg test material/m^3**.

3. INTRODUCTION

Analytical methods for the quantification **2-CHLORACRYLNITRIL** in test atmospheres was developed. This work was conducted in preparation for investigations on the inhalation toxicity of this test material. The method and its validation is described in this report.

A vapor of the test material was absorbed in impinger flask filled with toluene. After complete absorption with tolueneit is quantified analytically by gas chromatography. The GC is equipped with an electron capture detector (ECD). Standard solutions of approved test material were used as a basis for evaluation.

Investigations necessary for drafting the Standard Operating Procedure were conducted in May 95 at the Institute of Industrial Toxicology, Department of Toxicology of Bayer AG, D-42096 Wuppertal-Elberfeld, Friedrich-Ebert-Strasse 217-333.

The study documentation (raw data and final analytical report) has been archived in locations specified by Bayer AG, in accordance with GLP requirements.

Study-No.: T9059294

4. MATERIALS AND METHOD

4.1. GAS CHROMATOGRAPHY

4.1.1. Instrument

Gas chromatograph HP 5890 II equipped with **
- split/splitless injector for capillary columns
- ECD (electron capture Detector)
- Autosampler (HP 7673B)
- Integration: HP 3365 DOS-WorkStation (ALICE, Vers. 2.x) **

supplied from Hewlett-Packard Inc.

4.1.2. Method

Column:	fused Silica	L: 25 m; ID: 0.32 mm
Stationary phase:	HP 1	100% dimethylpolysiloxane
Film thickness:		0.17 µm
Temperatures:	Injector:	100°C
	Oven:	70°C {0 min} -->30°/min-->100°C {2.0 min}
	Detector:	250°C
Carrier gas:	Helium:	1.0 ml/min (70°C)
Make up Gas:	argon/methane:	30.0 ml/min
Injection volume:		1.0 µl autosampler (splitless)

4.2. OTHER INSTRUMENTS

Gas measuring device (Elster) **
Mini A-Pump (P) (Leybold-Heräeus) **
Rotameter (R) **
Manometer (D) **
Needle valve (V)
calibrated thermometer for temperature measurement
calibrated barometer
10, 20,50, 500 ml volumetric flasks
Glasfunnels **

Impinger flasks (50 ml)
Filling: each Flask 20 ml toluene

Gas tight Syringes (25 µl; 100 µl; 250 µl; 10 ml ; Hamilton) **

** or equivalent

(The instruments are regulary maintained and calibrated.)

4.3. SOLVENTS AND CHEMICALS

Toluene p.a.; Merck
Deionized water (Milli-Q-water), Millipore unit

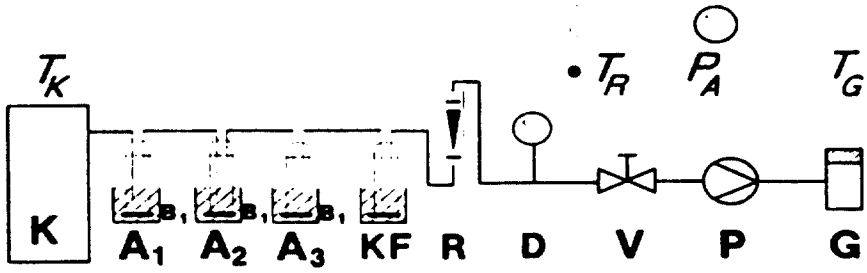
5. SAMPLE COLLECTION AND PREPARATION

Two (three) series-connected impinger flasks each with 20 ml toluene (A_1+A_2) were connected to the sampling instrument (air throughput 0.5 l/min) (Fig. 1). The total volume of air sampled (V_X), the temperature of the gas flowmeter (T_G), the temperature of the inhalation chamber (T_K), and the barometric pressure (P_A) are recorded.

After the end of the sample collection the contents of both bottles (A_1, A_2) were transferred together to a 50 ml volumetric flask. The volumetric flask is then brought up to volume with toluene.

The 3rd wash bottle (A_3) served the purpose of assuring that all of the test material was scrubbed by the first two bottles. As no detectable amounts of test material and toluene were recovered after sampling any atmosphere concentration, addition of this bottle was found to be not required. All fractions were injected onto the GC after appropriate dilution.

Figure 1: Sample collection instrument



K	Inhalation chamber	P	Pump
A_1-A_3	impinger; with: 20 ml nitro toluene each	G	Gas flow meter
KF	condenser (optional)	T_G	Temperature of Gas flow meter
R	Flow meter	T_K	Temperature of chamber
D	Manometer	T_R	Room Temperature
V	Needle valve	P_A	Barometric pressure

6. CALIBRATION OF THE ANALYTICAL METHOD

To set-up the calibration series, test material solutions in toluene were prepared with appropriate concentrations. The method-specific parameters were adjusted on the GC instrument. 1.0 µl of each calibration concentration was injected twice in succession.

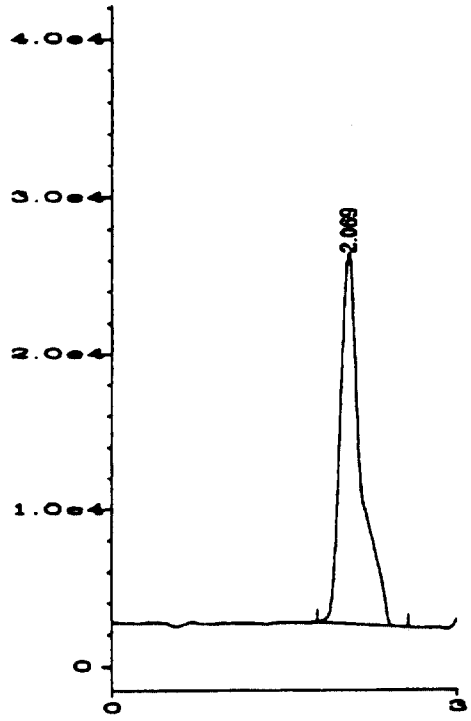
Fig. 2 shows a typical chromatogram of these external calibration solutions. A statistically evaluated calibration curve is shown in Fig. 3. This curve was plotted by the integrator and was based upon the injected concentrations. The calibration curve was plotted anew for each analysis sequence, and deviations from this calibration range were therefore possible. All sample concentrations are always within the calibration range documented for each sample sequence. The quantitative evaluation was performed by determination and comparing the peak area of 2-CHLORACRYLNITRIL of the analytical solution with the peak areas of the external standard solutions.

Retention time: 2-CHLORACRYLNITRIL approx. 2.1 min

concentration range: 0.0276 to 0.276 µg/ml

Figure 2. typical GC chromatograms of standard solutions 2-CHLORACRYLNITRIL

2.1.:concentration: 0.104 µg/ml



2.2.:concentration: 0.208 µg/ml

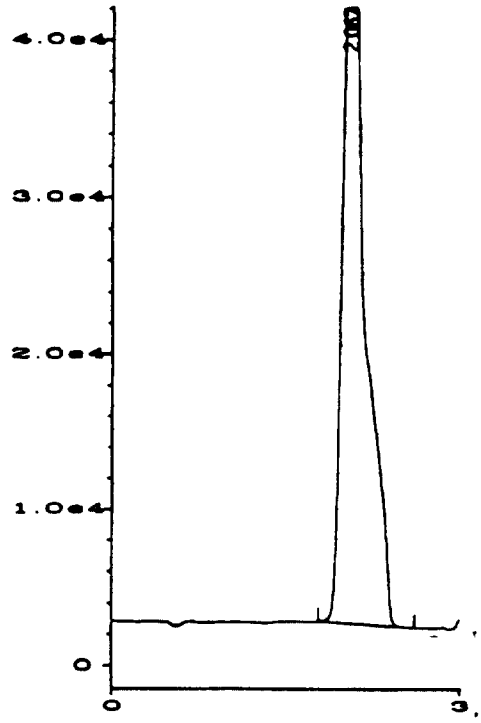
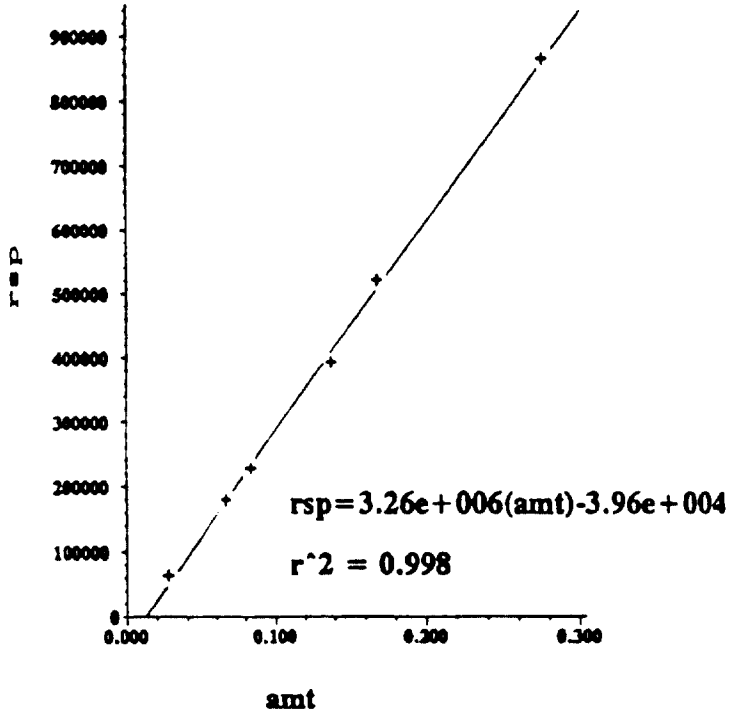


Figure 3: Calibration curve for 2-CHLORACRYLNITRIL date: May 5, 1995



The calibrations are linear in the ranges shown. The linear regression value is r^2 = 0,998

7. CALCULATION OF THE ANALYTICAL RESULTS

Each sample within a sequence was injected twice. The integrator evaluates each sample based on the plotted external standard calibration curves (see section 6.). The results are expressed in units of µg test material/ml solution.
The test material concentration or solvent concentration in the test atmosphere was determined from the relationship:

$$\text{mg test material} / m^3 \text{ air} = \frac{X * F}{V_x} * \frac{(273 + T_G)}{(273 + T_K)}$$

F		dilution factor (= 50 for undiluted analytical solution)
X	[µg/ml]	test material concentration in the analytical solution
V_X	[l]	chamber atmosphere collected volume
T_G	[°C]	temperature of the gas flowmeter
T_K	[°C]	temperature of the inhalation chamber

8. STABILITY

The stability of 2-CHLORACRYLNITRIL in toluene was checked at room temperature over a period of 76 hours. The solutions tested were found to be stable. No decrease in concentrations were observed.

9. PRECISION

The precision of this analytical method was assessed by 10 separate injections for each of two relevant concentrations of the calibration standards. The concentration values obtained with a statistical evaluation (coefficient of variation c_V) are presented in table 1. The precision of this method was found to satisfy the analytical requirements.

Table 1:

0.0672 [µg/ml]	0.168 [µg/ml]
0.0693	0.172
0.0691	0.171
0.0694	0.171
0.0697	0.172
0.0694	0.171
0.0698	0.173
0.0695	0.173
0.0699	0.172
0.0700	0.173
0.0697	0.172
MEAN = 0.0969	**MEAN = 0.172**
c_V = 0.41%	**c_V = 0.47%**

10. RECOVERY

A recovery assessment was not required. It was tested, that all of the test material was scrubbed by the used bottles.

11. DETECTION LIMIT

The limit of quantitation of the analytical method is 0.0276 µg test material/ml toluene . With a sample collection volume of 10 litres and an end dilution volume of 50 ml, a concentration of **0.138 µg test material/m^3** can be accurately determined.

12. LITERATURE

ChemG

Bundesgesetzblatt, Part I of July 29, 1994
Grundsätze der Guten Laborpraxis, Seite 539-547.

End of Report