United States
Environmental Protection
Agency

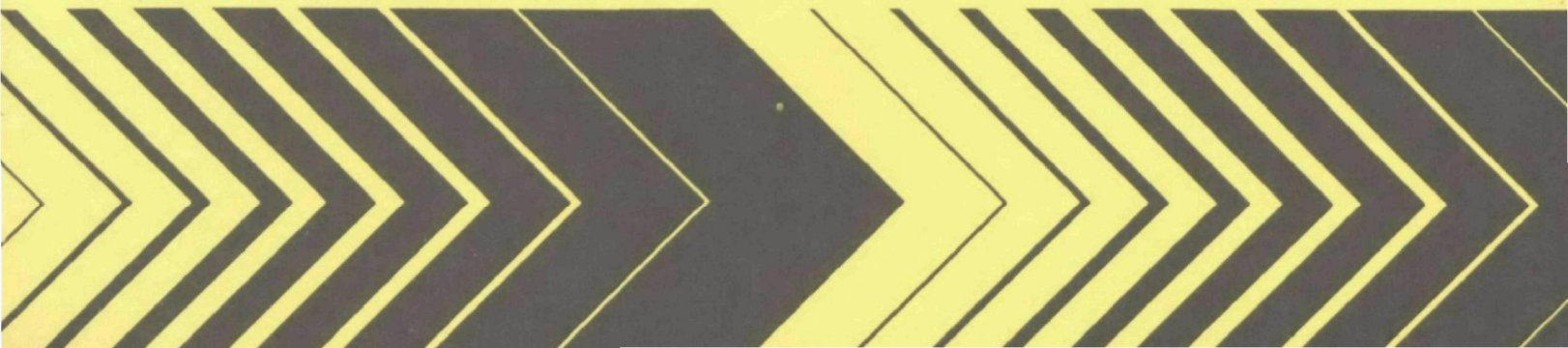
Health Effects Research
Laboratory, MD-51
Research Triangle Park NC 27711

JAN 79

Research and Development

EPA

Report Abstracts
Health Effects Research Laboratory RTP



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
HEALTH EFFECTS RESEARCH LABORATORY
RESEARCH TRIANGLE PARK
NORTH CAROLINA 27711

The Health Effects Research Laboratory conducts an extensive research program to evaluate the human health implications of environmental factors related to our industrialized society.

The HERL Report Abstracts is published quarterly as a current awareness tool for those who are interested in the activities of the Laboratory. Included are abstracts of Office of Research and Development reports published during the quarter. If journal or symposia papers by HERL personnel have been published during the quarter, their abstracts will also be included.

Full reports are available (prepaid) from the:

National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road
Springfield, Va 22151
(phone: 703/321-8543)

Journal articles or symposia papers are usually available from local libraries. Should you have difficulty in obtaining them locally, you may write to us for a copy.

If you wish to discontinue receiving these quarterly abstracts, or nominate additional recipients, please fill in the required information below, as well as the return address block on the reverse, and return this sheet to us.

F. Gordon Hueter
Acting Director,
Health Effects Research Laboratory

.....

( ) Please discontinue sending these abstracts to me.

( ) Please send your quarterly Report Abstracts to the addressees listed below:

PLACE
STAMP
HERE

(Please include ZIP Code)

U. S. Environmental Protection Agency
Office of Research and Development
Health Effects Research Laboratory
Research Triangle Park, N.C. 27711

Attn: Technical Information Coordinator
Mail Drop 51

(Fold on dotted line and seal before mailing)

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/1-78-052		

4. TITLE AND SUBTITLE	5. REPORT DATE
DIRECTORY OF SHORT TERM TESTS FOR HEALTH AND ECOLOGICAL EFFECTS	July 1978
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Biochemistry Branch Environmental Toxicology Division Health Effects Research Laboratory Research Triangle Park,NC 27711	10. PROGRAM ELEMENT NO. 1LA629, EHE625, 1AA601
	11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS Health Effects Research Laboratory RTP,NC Office of Research and Development U.S. Environmental Protection Agency Research Triangle Park, N.C. 27711	13. TYPE OF REPORT AND PERIOD COVERED
	14. SPONSORING AGENCY CODE EPA 600/11

15. SUPPLEMENTARY NOTES

Project Officer is Dr. Michael Waters (919-541-2537)

16. ABSTRACT

This directory provides basic information on the short term tests for health and ecological effects being performed by various U.S. EPA Laboratories through the Office of Health and Ecological Effects. The test systems are cross-indexed.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
environmental tests laboratories biological laboratories directories indexes (documentation)	short term tests	06 F, T

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	
	20. SECURITY CLASS *(This page)*	22. PRICE
	UNCLASSIFIED	

EPA Form 2220-1 (9-73)

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/1-78-060		

4. TITLE AND SUBTITLE	5. REPORT DATE
Toxaphene Composition and Toxicology	September 1978
	6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
John E. Casida and Mahmoud Abbas Saleh	

9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
Pesticide Chemistry and Toxicology Laboratory Department of Entomological Sciences University of California Berkeley, CA 94720	1EA615
	11. CONTRACT/GRANT NO.
	R-803913

12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
Health Effects Research Laboratory RTP,NC Office of Research and Development U.S. Environmental Protection Agency Research Triangle Park, N.C. 27711	14. SPONSORING AGENCY CODE EPA 600/11

15. SUPPLEMENTARY NOTES

Project Officer is Dr. Ronald L. Baron (919-541-2655)

16. ABSTRACT

The composition and metabolism of Toxaphene have been examined to aid in understanding the conditions under which this insecticide can be most effectively and safely used. Each of 8 Toxaphene samples manufactured by Hercules Chemical Co. from 1949 to 1975 shows the same 29 major peaks and in almost identical ratios. About 85% of the total peak area is accounted for by these 29 peaks which individually vary from 1 to 8% of the total. The 8 Toxaphene samples were easily differentiated from 12 samples of chlorinated terpenes from other manufacturers in the United States and abroad. There is surprisingly little variation in the acute toxicity of any sample.

Five major Toxaphene components (2,2,5-endo,6-exo,8,9,10-heptachlorobornane (I) and its 3-exo-chloro-, 8-chloro-, 9-chloro- and 10-chloro-derivatives) collectively account for up to 23% of the technical grade Toxaphene and up to 34% of those of chlorinated 2-exo,10-dichlorobornane. Chlorination of 2-exo,10-dichlorobornane provides a convenient source of I and other chlorinated bornanes. The toxicity to mice, houseflies and goldfish of the octachlorobornanes formed by introducing chlorine substituents into I, relative to I itself, generally decreases in the order: 9-chloro > 8-chloro > no added chlorine (i.e. I) > 3-exo-chloro, 5-exo-chloro or 10-chloro.

Fat from chickens and mammals treated orally with Toxaphene contains products similar in GLC characteristics to Toxaphene itself whereas liver and feces contain Toxaphene-derived products of greatly altered GLC properties. Toxaphene preparations and related chlorinated terpenes are mutagens in the histidine-requiring Salmonella typhimurium assay. The most potent mutagenic components, which are not identified, reside in the polar fractions on crystallization or solumn chromatography.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
insecticides metabolism composition(property) toxicity	Toxaphene	07 C 06 A, T

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	65
	20. SECURITY CLASS *(This page)* UNCLASSIFIED	22. PRICE

EPA Form 2220-1 (9-73)

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/1-78-063		

4. TITLE AND SUBTITLE	5. REPORT DATE
HEALTH EFFECTS ASSOCIATED WITH DIESEL EXHAUST EMISSION Literature Review and Evaluation	November 1978 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
J. Santodonato, D. Basu, P. Howard	
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
Syracuse Research Corporation Merrill Lane Syracuse, New York 13210	1AA601 11. CONTRACT/GRANT NO. 68-02-2800
12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
Health Effects Research Laboratory RTP,NC Office of Research and Development U.S. Environmental Protection Agency Research Triangle Park, N.C. 27711	14. SPONSORING AGENCY CODE EPA 600/11

15. SUPPLEMENTARY NOTES

Project Officer is Mr. James Smith (919-541-2909)

16. ABSTRACT

Engineering tests have shown a significant improvement in fuel economy in light duty vehicles equipped with diesel engines versus those equipped with gasoline engines. Automobile manufacturers are considering a major program for conversion to diesel engines in the automobile fleet by 1985. Available studies show rather large differences in emissions from diesel engine exhausts as opposed to gasoline engine exhaust. Conversion of a major portion of the automobile fleet to diesel engines may significantly change the ambient concentrations of both regulated and uregulated pollutants, and hence the potential human exposure pattern. Such changes may impact upon public health, and consequently require changes in air quality standards, and/or new emissions or air quality standards. An assessment of the current state of knowledge regarding the health effects from diesel exhaust emissions, and the identification of major research needs, are important factors which must be considered by the EPA under the 1977 Amendments to the Clean Air Act.

In order to accomplish this objective, the following information on diesel emissions has been reviewed in this document: physical and chemical characteristics; biological effects in animals and man; epidemiologic studies; knowledge gaps; and research needs.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
diesel fuels exhaust gases health toxicology reviews		06 F, T

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	163
	20. SECURITY CLASS *(This page)*	22. PRICE
	UNCLASSIFIED	

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/1-78-064		

4. TITLE AND SUBTITLE
DESCRIPTION OF THE CLEANS HUMAN EXPOSURE SYSTEM

5. REPORT DATE
November 1978

6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)
Arthur A. Strong

8. PERFORMING ORGANIZATION REPORT NO.

9. PERFORMING ORGANIZATION NAME AND ADDRESS
Clinical Studies Division
Health Effects Research Laboratory
U.S. Environmental Protection Agency
Research Triangle Park, N.C. 27711

10. PROGRAM ELEMENT NO.
1AA601

11. CONTRACT/GRANT NO.

12. SPONSORING AGENCY NAME AND ADDRESS
Health Effects Research Laboratory RTP,NC
Office of Research and Development
U.S. Environmental Protection Agency
Research Triangle Park, N.C. 27711

13. TYPE OF REPORT AND PERIOD COVERED

14. SPONSORING AGENCY CODE
EPA 600/11

15. SUPPLEMENTARY NOTES
Mr. Strong's telephone number is (919-541-2872)

16. ABSTRACT Legislative mandates require the Environmental Protection Agency to determine the levels of risk to the human population exposed to air pollutants and establish standards to limit that risk. Two stainless steel Controlled Environmental Laboratories (CEL) were constructed in the EPA Clinical Studies Laboratory Facilities in Chapel Hill, North Carolina to determine the pulmonary and cardiovascular health problems of humans exposed to ambient levels of selected air pollutants. Both gaseous and water soluble particulate pollutants can be generated in desired concentrations in accurately controlled air flows, temperatures, humidities, and light levels. Each CEL operates independently of the other, and the pollutants can be introduced either singly or in combinations. Four PDP-11/40 computers are required to automate all control, measurement, and data acquisition for the CEL environment and the physiological measurements of the test subjects. The exposure system was designed to house six test subjects for several weeks without interruption of the exposure insult.

A brief description of the exposure laboratories and the support systems including their functions is provided. The methodology used to measure and control the conditions in each CEL is included along with a list of the physiological capabilities.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
test chambers humans environmental tests laboratories air pollution	CLEANS	06 F, L 14 B

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	37
	20. SECURITY CLASS *(This page)* UNCLASSIFIED	22. PRICE

EPA Form 2220-1 (9-73)

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/1-78-065		

4. TITLE AND SUBTITLE	5. REPORT DATE
MECHANISMS OF PESTICIDE DEGRADATION	November 1978
	6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
Fumio Matsumura	

9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
Department of Entomology University of Wisconsin Madison, Wisconsin 53706	1EA615
	11. CONTRACT/GRANT NO.
	R-801060

12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
Health Effects Research Laboratory Office of Research and Development U.S. Environmental Protection Agency Research Triangle Park, N.C. 27711	14. SPONSORING AGENCY CODE EPA 600/11

15. SUPPLEMENTARY NOTES

Project Officer is Dr. Robert Moseman (919-541-2330)

16. ABSTRACT

This research project was initiated with the overall objective of determining (1) the chemical structures of toxic components of toxaphene, (2) to study anaerobic metabolism to degrade toxaphene and other pesticides, and (3) to understand toxic action mechanism of chlordimeform.

As a result of intensive efforts the molecular structures of three of the most toxic principles of toxaphene were identified. Together these comprise at least 70% of toxaphene's toxicity toward mice. This is the first time that the structure of toxic components of toxaphene became apparent despite the widespread use (over 1 billion pounds, which is comparable to DDT) of toxaphene in the last 3 decades. Toxaphene on the other hand degrades relatively faster than other chlorinated pesticides such as DDT and dieldrin. The reason for it is that toxaphene is susceptible to reductive degradative forces.

Chlordimeform was found to affect amine regulatory mechanisms in animals. Such actions explain some of the subtle effects of this pesticide on animals. Inasmuch as that biogenic amines are known to play many important biological roles such as controlling emotion, behavior and circulatory functions of the body.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
pesticides toxicity chlorohydrocarbons molecular structures	toxaphene chlordimeform	07 C 06 T

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	40
	20. SECURITY CLASS *(This page)* UNCLASSIFIED	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/1-78-066		

4. TITLE AND SUBTITLE	5. REPORT DATE
EFFECT OF INSECTICIDES ON BENZO(A)PYRENE CARCINOGENESIS	November 1978
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
Anthony J. Triolo	
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
Jefferson Medical College Thomas Jefferson University Philadelphia, PA 19107	1EA615
	11. CONTRACT/GRANT NO.
	R-803486
12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
Health Effects Research Laboratory RTP,NC Office of Research and Development U.S. Environmental Protection Agency Research Triangle Park, N.C. 27711	14. SPONSORING AGENCY CODE EPA 600/11

15. SUPPLEMENTARY NOTES

Project Officer is Dr. Thomas M. Scotti (919-541-2367)

16. ABSTRACT

The pesticides parathion, toxaphene, and carbaryl were tested for their ability to induce tumors in the forestomach and lungs of female Ha/ICR and A/J mice respectively. None of these pesticides, when fed alone in the diet of the mice, showed significant oncogenic activity. On the other hand, toxaphene enhanced benzo(a)pyrene (BP)-induced tumors and increased BP hydroxylase activity in the forestomach of the Ha/ICR mice and carbaryl enhanced BP-induced tumors and increased BP hydroxylase activity in the lungs of the A/J mice. In each instance, it is possible that toxaphene and carbaryl exhibited a cooncogenic effect in enhancing the BP-induced tumors. Conversely, toxaphene decreased the incidence of BP-induced tumors and inhibited BP hydroxylase activity in the lungs of the A/J mice. These results suggest that increased BP hydroxylase activity in tissues tends to enhance tumor formation and a decrease in the enzyme activity may have a protective effect against tumors. The relationship between enzyme inducibility and tumor formation may be due to the level of oncogenic epoxides formed in target organs. Further, studies of the formation of specific oncogenic epoxides of BP in tissues after treatment with these pesticides would help towards defining more clearly the relationship between BP hydroxylase inducibility and BP oncogenesis.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
neoplasms pesticides carcinoid tumors toxicology	oncogenesis carcinogenesis benzo(a)pyrene hydroxylase aryl hydrocarbon hydroxylase	06 F, T

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	38
	20. SECURITY CLASS *(This page)*	22. PRICE
	UNCLASSIFIED	

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/1-78-067		

4. TITLE AND SUBTITLE	5. REPORT DATE
STUDY OF CHILDREN'S BLOOD-LEAD LEVELS WITHIN FAMILIES	November 1978
	6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
Danica Prpic-Majjic	

9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
Institute for Medical Research and Occupational Health Zagreb, Yugoslavia	1AA601
	11. CONTRACT/GRANT NO. SFCP-JF-3-570-2

12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
Health Effects Research Laboratory Office of Research and Development U.S. Environmental Protection Agency Research Triangle Park, N.C. 27711	14. SPONSORING AGENCY CODE EPA 600/11

15. SUPPLEMENTARY NOTES

Project Officer is Dr. Robert J.M. Horton (919-541-2909)

16. ABSTRACT

Comparative studies of the biological indices of elevated exposure to lead in children and adults were conducted with the intention of reaching a better understanding of lead absorption in children. Three family groups were examined. Group 1 consisted of families who lived in the vicinity of a lead smelter and whose fathers were occupationally highly exposed to lead. Group 2 consisted of families settled in the same area, but whose fathers had no supplemental occupational exposure to lead. The third was the control group consisting of families who lived in an area with very low exposure and whose fathers were not occupationally exposed to lead. Families were selected with one child under 4 years and, if possible, another child of school age. In the environmental survey lead in air, dustfall, household-dust, and drinking-water were analyzed. Three biological parameters, erythrocyte δ-aminolevulinic dehydratase activity, erythrocyte protoporphyrin, and blood lead were determined. On the basis of these parameters the following sequence of lead absorption was established in family members living in an area with elevated lead exposure: fathers > school-age children ≈ children up to 4 years > mothers. Children with fathers occupationally exposed to lead had a slight additional lead exposure in comparison with children whose fathers had no supplemental occupational exposure to lead. It was found that the population living near a lead smelter, except for the fathers occupationally exposed to lead, had biological findings at the level of a "moderately elevated" exposure, while those occupationally exposed had "excessive" exposure.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
lead (metal) children blood analysis occupational diseases environmental surveys		06 F, T

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	153
	20. SECURITY CLASS *(This page)* UNCLASSIFIED	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/1-79-001		

4. TITLE AND SUBTITLE
EFFECT OF EXPOSURE TO PAN AND OZONE ON SUSCEPTIBILITY TO CHRONIC BACTERIAL INFECTION

5. REPORT DATE
January 1979

6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)
Gail B. Thomas, James D. Fenters and Richard Ehrlich

8. PERFORMING ORGANIZATION REPORT NO.

9. PERFORMING ORGANIZATION NAME AND ADDRESS
IIT Research Institute
Life Sciences Research Division
10 West 35th Street
Chicago, IL 60616

10. PROGRAM ELEMENT NO.
1AA601

11. CONTRACT/GRANT NO.
68-02-1273

12. SPONSORING AGENCY NAME AND ADDRESS
Health Effects Research Laboratory RTP,NC
Office of Research and Development
U.S. Environmental Protection Agency
Research Triangle Park, N.C. 27711

13. TYPE OF REPORT AND PERIOD COVERED

14. SPONSORING AGENCY CODE
EPA 600/11

15. SUPPLEMENTARY NOTES
Project Officer is Dr. Donald E. Gardner (919-541-2531)

16. ABSTRACT

The effects of peroxyacetyl nitrate (PAN) and ozone (O_3) on susceptibility of mice and guinea pigs to chronic and acute respiratory infections were studied. The agent used for the acute infectious disease was Streptococcus sp. whereas Mycobacterium tuberculosis served as the agent for chronic respiratory infection. A significant increase in mortality due to streptococcal pneumonia was seen upon a single 3-hr exposure to PAN in concentrations ranging from 14.8 to 28.4 mg/m^3. Multiple daily exposures to 4.9 or 7.4 mg/m^3 PAN 3 hr/day, 5 days/week for up to 3 weeks had no effect on mortality, survival rates, or ability to clear inhaled Streptococcus sp. from the lungs. Daily 3-hr exposures to 25.0 mg/m^3 PAN did not produce any marked changes in the chronic infection as measured by M. tuberculosis titers in the lungs. The diameter of erythemas, expressing the cutaneous delayed hypersensitivity reaction were persistently smaller in guinea pigs exposed to PAN than those exposed to air. Multiple exposures to 19.8 mg/m^3 PAN resulted ininitial elevation of antibody titers, but depression of titers during the later (12 to 15 week) observation period. A single exposure to the same concentration of PAN resulted in a significant increase in total number of cells lavaged from their lungs but somewhat decreased levels of adenosine triphosphate (ATP). Exposure to 7.4 mg/m^3 PAN 3 hr/day, 5 days/week for 2 weeks resulted in reduced total cell counts and a significant reduction of ATP levels in alveolar macrophages. Scanning electron microscopic observations of the respiratory tract showed that the nonciliated cells of the nasal cavities and tracheas of mice exposed to PAN were raised and sloughing and excess mucus was present. In older mice lung congestion was enhanced by PAN exposure. Exposures to ozone resulted in increased titers of M. tuberculosis in the lungs, depression of hypersensitivity reaction and elevation in serum antibody titers.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
peroxyacetic acid ozone respiratory infection toxicity sensitivity		06 F, T

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	40
	20. SECURITY CLASS *(This page)*	22. PRICE
	UNCLASSIFIED	

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

TECHNICAL REPORT DATA

(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/1-79-002		

4. TITLE AND SUBTITLE
Environmental Carcinogens and Human Cancer: Estimation of Exposure to Carcinogens in the Ambient Air

5. REPORT DATE
January 1979

6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)
Niren L. Nagda, Ph.D.

8. PERFORMING ORGANIZATION REPORT NO.
GEOMET Report Number HF-701

9. PERFORMING ORGANIZATION NAME AND ADDRESS
GEOMET, Incorporated
15 Firstfield Road
Gaithersburg, MD 20760

10. PROGRAM ELEMENT NO.
1HE775

11. CONTRACT/GRANT NO.
68-03-2504

12. SPONSORING AGENCY NAME AND ADDRESS
Health Effects Research Laboratory RTP,NC
Office of Research and Development
U.S. Environmental Protection Agency
Research Triangle Park, N.C. 27711

13. TYPE OF REPORT AND PERIOD COVERED
Final Task Report

14. SPONSORING AGENCY CODE
EPA 600/11

15. SUPPLEMENTARY NOTES
Project Officer is Dr. Carl Hayes (919-541-2242)

16. ABSTRACT

In this study, a methodology for ambient exposure analysis of carcinogens was developed based on a pilot study of the Detroit Metropolitan area. The specific aim of the analysis was to identify high and low exposure areas within the study area. Four known or suspected carcinogens and groups of carcinogens: BaP, trichloroethylene, nickel and its compounds, and cadmium and its compounds were studied. The analysis of ambient exposure to BaP consisted of the use of the Air Quality Display Model (AQDM) to simulate levels of BaP which might have existed during 1956 to 1960. The analysis for BaP involved a multistep procedure. In order to examine the accuracy of AQDM predicted BaP ambient concentrations, present conditions (1975-1976) were simulated and compared against known concentrations in the area. Next, BaP emissions for the period 1956-1960 were estimated by analyzing past trends for significant sources. This emissions data base, along with meteorological data for the same period, was used as an input to ADQM to predict historical exposure to BaP. The analysis for the other three carcinogens was less detailed than that for BaP. It was comprised of estimation of emissions and calculation of emission density for each of the three carcinogens. For nickel and cadmium, it also included a comparison of spatial variation in emissions with measured air quality patterns in the Detroit area. The results of this study were very encouraging in light of the scarcity of data on carcinogens. Excellent correlation between observed and estimated concentrations was obtained for BaP. In the case of nickel and cadmium, the estimated emission density patterns matched well with observed air quality patterns. Due to the lack of data on ambient concentrations, a similar comparison was not possible for trichloroethylene. The carcinogen exposure patterns developed in this study are being used in the selection of population samples for an epidemiological study of the area.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Carcinogens* Air pollution* Exposure* Mathematical model	Detroit Benzo-a-pyrene Cadmium Trichloroethylene Air Quality Display Model (AQDM)	06, F

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
Release Unlimited	Unclassified	150
	20. SECURITY CLASS *(This page)*	22. PRICE
	Unclassified	

EPA Form 2220-1 (9-73)

TECHNICAL REPORT DATA (Please read Instructions on the reverse before completing)		
1. REPORT NO. EPA-600/7-79-009	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE INTERAGENCY PROGRAM IN ENERGY-RELATED HEALTH AND ENVIRONMENTAL EFFECTS RESEARCH - Project Status Report		5. REPORT DATE January 1979 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Health Effects Research Laboratory Office of Health and Ecological Effects U.S. Environmental Protection Agency Research Triangle Park, N.C. 27711		10. PROGRAM ELEMENT NO. EHE625 11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS Office of Health and Ecological Effects Office of Research and Development U.S. Environmental Protection Agency Washington, DC 20460		13. TYPE OF REPORT AND PERIOD COVERED 14. SPONSORING AGENCY CODE EPA 600/11
15. SUPPLEMENTARY NOTES Project Officer is Mr. Jim Smith (919-541-2909)		

16. ABSTRACT

ABSTRACT

This report summarizes research supported by the EPA Health Effects Research Laboratory at Research Triangle Park, NC, under the Federal Interagency Energy/Environment R & D Program. The EPA has had the lead responibility for the planning, coordination and implementation of this program since fiscal year 1975.

Projects reported in this document are grouped under one of four major research areas. The first area is identification of hazardous agents associated with non-nuclear energy technologies. These projects involved the development of qualitative methods for the identification of hazardous materials. The second area is development of more rapid and sensitive methods to evaluate dose to man. These projects focused on the development of quantitative methods for measuring degree of toxicity of various pollutants. The third area is determination of the metabolism and fate of hazardous agents associated with energy technologies. These projects involved determination of the physiological activities of several known carcinogens. The fourth research area is evaluation of hazards to man. In addition to studies of the effects of certain pollutants on humans, several of the projects concerned preparation of standard pollutant samples for use in future studies to increase the comparability of results.

A list of additional studies funded under this program is included.

17. KEY WORDS AND DOCUMENT ANALYSIS		
a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
bioassay hazardous agents energy environments metabolism carcinogens		06 F, T
18. DISTRIBUTION STATEMENT RELEASE TO PUBLIC	19. SECURITY CLASS (This Report) UNCLASSIFIED 20. SECURITY CLASS (This page) UNCLASSIFIED	21. NO. OF PAGES 167 22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/9-78-027		

4. TITLE AND SUBTITLE	5. REPORT DATE
Application of Short-Term Bioassays in the Fractionation and Analysis of Complex Environmental Mixtures	September 1978
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Environmental Toxicology Division Health Effects Research Laboratory U.S. Environmental Protection Agency Research Triangle Park, N.C. 27711	10. PROGRAM ELEMENT NO. 1NE625
	11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS U.S. Environmental Protection Agency RTP,NC Office of Research and Development Health Effects Research Laboratory Research Triangle Park, N.C. 27711	13. TYPE OF REPORT AND PERIOD COVERED
	14. SPONSORING AGENCY CODE EPA 600/11

15. SUPPLEMENTARY NOTES

Project Officer is Dr. Michael Waters (919-541-2537)

16. ABSTRACT

This report is the proceedings of a symposium convened at Williamsburg, Virginia February 21-23, 1978. The volume consists of 24 formal presentations that amplify the three major topics discussed during the symposium: an overview of short-term bioassay systems; current methodology involving the collection and chemical analysis of environmental samples; and current research involving the use of short-term bioassays in the fractionation and analysis of complex environmental mixtures. The purpose of these proceedings is to present the state-of-the-art techniques in bioassay and chemical analysis as applied to complex mixtures and to foster continued advancement of this important area of collaborative research. Complex mixtures discussed include ambient air and water, waste water, drinking water, shale oil, synthetic fuels, automobile exhaust, diesel particulate, coal fly ash, cigarette smoke condensates, and food products.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Bioassay mixtures air shale oil exhaust emissions fly ash smoke food water	short-term bioassay	06, F

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	
	20. SECURITY CLASS *(This page)*	22. PRICE
	UNCLASSIFIED	

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/9-78-034		

4. TITLE AND SUBTITLE	5. REPORT DATE
SHORT-TERM TESTS FOR HEALTH AND ECOLOGICAL EFFECTS. Part I: Program Overview. Part II: Directory of Tests	November 1978
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Biochemistry Branch Environmental Toxicology Division Health Effects Research Laboratory Research Triangle Park, N.C. 27711	10. PROGRAM ELEMENT NO. 1LA629, EHE625, 1AA601 11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS Health Effects Research Laboratory Office of Research and Development U.S. Environmental Protection Agency Research Triangle Park, N.C. 27711	13. TYPE OF REPORT AND PERIOD COVERED 14. SPONSORING AGENCY CODE EPA 600/11

15. SUPPLEMENTARY NOTES

Project Officer is Dr. Michael Waters (919-541-2537)

16. ABSTRACT

This report is the proceedings of an Office of Health and Ecological Effects (OHEE), U.S. Environmental Protection Agency workshop held at the Research Triangle Park, North Carolina, in January of 1978.

The proceedings consists of eight papers. The first paper is the keynote address; the other seven papers overview the work being done in short-term testing for health and ecological effects by the various U.S. Environmental Protection Agency, Office of Health and Ecological Effects Laboratories.

Included with the proceedings in the Directory of Short-Term Tests for Health and Ecological Effects, which is also published separately as EPA-600/1-78-052. The directory, which was compiled as a result of the workshop, provides basic information about the individual short-term tests for health and ecological effects. The test systems are cross-indexed.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
environmental tests laboratories biological laboratories directories indexes (documentation)	short term tests	06 F, T

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	
	20. SECURITY CLASS *(This page)* UNCLASSIFIED	22. PRICE

EPA Form 2220-1 (9-73)

MS-77-104

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2. JOURNAL ARTICLE	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE ENHANCED PESTICIDE METABOLISM, A PREVIOUSLY UNREPORTED EFFECT OF DIETARY FIBRE IN MAMMALS		5. REPORT DATE 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) R. W. Chadwick, M. F. Copeland and C. J. Chadwick		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Environmental Toxicology Division Health Effects Research Laboratory U.S. Environmental Protection Agency Research Triangle Park, N. C. 27711		10. PROGRAM ELEMENT NO. 1EA615 11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS Health Effects Research Laboratory RTP, NC Office of Research and Development U.S. Environmental Protection Agency Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED 14. SPONSORING AGENCY CODE EPA 600/11

15. SUPPLEMENTARY NOTES
Published in: Food Cosmet. Toxicol. 16:217-225, 1978

16. ABSTRACT

The effects of various dietary fibres on the metabolism of the organochlorine insecticide, lindane, were compared. Groups of six weanling female Sprague-Dawley rats were fed either a synthetic low-residue diet (LRD), LRD + 10% pectin, LRD + 10% agar, LRD + 10% cellulose, or Purina Lab Chow for 28 days. The animals were then dosed orally with 2·87 mg lindane (containing 1·66 μCi{U-^{14}C}lindane) and were killed 24 hr later. A smaller proportion of administered radioactivity was recovered in the excreta and selected tissues from the rats fed the LRD diet than from other groups and the fate of the radioactivity not accounted for was investigated in a second experiment using rats fed either LRD unsupplemented, LRD + 10% pectin or the standard chow diet. Pectin and the dietary fibre contained in Purina Lab Chow caused significant alterations in the metabolism of lindane. A significant increase in the excretion of radiolabelled products, a higher level of conjugated chlorophenols and polar metabolites, a significant alteration in the proportions of the excreted chlorophenols and significant stimulation of the enzymes involved in lindane metabolism indicated that dietary fibre such as pectin or the plant fibre in Purina Lab Chow can significantly affect the metabolism of xenobiotics in mammals.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pesticides Metabolism Mammals Biochemistry		06F, T

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	
	20. SECURITY CLASS *(This page)* UNCLASSIFIED	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

MS-78-002

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2. JOURNAL ARTICLE	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE: A Micro Derivatization Technique for the Confirmation of Trace Quantities of Kepone		5. REPORT DATE 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S): R. F. Moseman, M. K. Ward, H. L. Crist, and R. D. Zehr		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Environmental Toxicology Division, Health Effects Research Laboratory, Office of Research and Development, Research Triangle Park, N.C. 27711		10. PROGRAM ELEMENT NO.: 1EA615 11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS: Health Effects Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Research Triangle Park, N.C. 27711 RTP, NC		13. TYPE OF REPORT AND PERIOD COVERED 14. SPONSORING AGENCY CODE: EPA 600/11

15. SUPPLEMENTARY NOTES

Published in: Journal of Agricultural and Food Chemistry 26 (4):965-968, 1978

16. ABSTRACT

A rapid and simple procedure has been devised for the confirmation of nanogram quantities of Kepone that is sensitive to part per billion levels in environmental and biological samples. Electron-capture gas chromatography of the perchlorinated derivative enabled confirmation often not possible by other techniques such as gas chromatography combined with mass spectrometry. Conversion of Kepone to mirex was accomplished by a high-temperature closed-tube reaction. Mirex that might have been present in the original sample extract was separated from Kepone by a micro Florisil column cleanup step. The absence of mirex in cleaned-up sample extracts was verified during the electron-capture gas chromatographic quantitation for Kepone. The conversion of Kepone to mirex was quantitative, allowing for the estimation of Kepone by a separate technique. Thus, considerable confidence is added to analytical results. Details of the methodology and results obtained are discussed.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Toxicology Pesticides Kepone		06F, T

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
Release to Public	unclassified	
	20. SECURITY CLASS *(This page)* unclassified	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

MS-78-035

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2. JOURNAL ARTICLE	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE: THE IDENTIFICATION OF THREE PREVIOUSLY UNREPORTED LINDANE METABOLITES FROM MAMMALS		5. REPORT DATE 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S): Robert W. Chadwick, Joseph J. Freal, G. Wayne Sovocool, Charles C. Bryden and M. Frank Copeland		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Environmental Toxicology Division Health Effects Research Laboratory U.S. Environmental Protection Agency Research Triangle Park, NC 27711		10. PROGRAM ELEMENT NO. 1EA615 11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS Health Effects Research Laboratory RTP, NC Office of Research and Development U.S. Environmental Protection Agency Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED 14. SPONSORING AGENCY CODE EPA 600/11

15. SUPPLEMENTARY NOTES

Published in: Chemosphere 8:633-640, 1978

16. ABSTRACT

Previously unreported metabolites from the urine of rats treated with lindane have been identified as configurational isomers of 2,4,5,6- and 2,3,4,6-tetrachloro-2-cyclohexen-1-ol. In addition, an intermediate metabolite from the incubation of lindane with liver preparations, under N_2, has been identified as the configurational isomer γ-3,4,5,6-tetrachlorocyclohex-1-ene. The pathways leading to these metabolites appear to have an important role in the metabolism of lindane by mammals.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Metabolism Mammals Identifying Chemical analysis		06F, M, T

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	
	20. SECURITY CLASS *(This page)*	22. PRICE
	UNCLASSIFIED	

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

MS-78-054

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2. JOURNAL ARTICLE	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE: EFFECT OF URBAN OZONE LEVELS ON LABORATORY-INDUCED RESPIRATORY INFECTIONS		5. REPORT DATE 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S): Frederick J. Miller, Joseph W. Illing and Donald E. Gardner		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Statistics and Data Management Office Health Effects Research Laboratory U.S. Environmental Protection Agency Research Triangle Park, NC 27711		10. PROGRAM ELEMENT NO. 1AA816 11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS Health Effects Research Laboratory RTP, NC Office of Research and Development U.S. Environmental Protection Agency Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED 14. SPONSORING AGENCY CODE EPA 600/11

15. SUPPLEMENTARY NOTES

Published in: Toxicol. Let. 2:163-169, 1978

16. ABSTRACT

The effect of the time of exposure to an aerosol of viable microorganisms on the incidence of respiratory infections associated with a 3 h exposure to ozone (O_3) was studied. The 157 and 196 $\mu g/m^3$ (0.08 - 0.1 ppm) levels of O_3 used occur regularly in some urban communities. The studies reported here show that the susceptibility of mice to a laboratory-induced infection can be maximally enhanced if the infectious challenge is concurrent with the exposure to O_3.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Ozone Infectious diseases Respiratory infections Toxicology		06F, T

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	
	20. SECURITY CLASS *(This page)*	22. PRICE
	UNCLASSIFIED	

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

MS-77-055

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2. JOURNAL ARTICLE	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE: SIMILARITY BETWEEN MAN AND LABORATORY ANIMALS IN REGIONAL PULMONARY DEPOSITION OF OZONE		5. REPORT DATE 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S): Frederick J. Miller, Daniel B. Menzel, and David L. Coffin		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Statistics and Data Management Office, Research Triangle Park, NC 27711 and Division of Pharmacology, Duke University Medical Center, Durham, NC 27710		10. PROGRAM ELEMENT NO. 1AA816 11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS: Health Effects Research Laboratory RTP, NC; Office of Research and Development; U.S. Environmental Protection Agency; Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED 14. SPONSORING AGENCY CODE EPA 600/11

15. SUPPLEMENTARY NOTES

Published in: Environ Res. 17:84-101, 1978

16. ABSTRACT

Predicted pulmonary ozone (O_3) dose curves obtained by model analysis of the transport and removal of O_3 in the lungs of guinea pigs, rabbits, and man indicate that a general similarity exists among these species in the shapes of the dose curves. An overview of the major features of the lower airway mathematical model used is presented. This model predicts that the respiratory bronchioles receive the maximum O_3 dose. For exposures corresponding to tracheal O_3 concentrations greater than 100 $\mu g/m^3$ (0.05 ppm), the predicted respiratory bronchiolar dose for rabbits was found to be twice that for guinea pigs and 80% of that for man. Sensitivity analyses are presented for model parameters relating to the treatment of the chemical reactions of O_3 with the mucous layer. The role of tidal volume in the determination of pulmonary uptake of O_3 in man is examined. The consistency and similarity of the dose curves for the three species lend strong support to the validity of extrapolating to man the results obtained on animals exposed to O_3.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Ozone Respiratory infections Toxicology Lung		06F, T

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	
	20. SECURITY CLASS *(This page)* UNCLASSIFIED	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE