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November 19, 1980

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Document Control Officer
Chemical Information Division
Office of Toxic Substances (WH-557)
Environmental Protection Agency
401 M Street, S. W.
Washington, D. C. 20460

Gentlemen:

Subject: Section 8(e) Toxic Substances Control Act
N-ethyl Perfluorooctylsulfonamido Ethanol and
N-ethyl Perfluoroheptylsulfonamido Ethanol

Please find attached the following information and test results relating to the subject chemicals:

(1) Protocol for Oral Teratology Study in Rats.
(2) Preliminary report, 3M memo, dated November 12, 1980.

Preliminary information from the ongoing teratology study cited in (2) above indicates that the subject chemicals are teratogenic in rats. These preliminary findings lead us to submit the attached information pursuant to Section 8(e) of the Toxic Substances Control Act and EPA's statement of interpretation published in the FEDERAL REGISTER, March 16, 1978.

As noted on page 584 of an article published in the October 1980 American Industrial Hygiene Journal, entitled "Health Status of Plant Worker Exposed to Fluorochemicals -- A Preliminary Report", this publication and the attached information reflects, in part, 3M's testing and monitoring program designed to "...evaluate the overall impact of exposure of fluorochemicals on the health of workers". Although this preliminary information cited in (2) indicates that the subject chemicals are most probably animal teratogens our employee records and the epidemiology data described in the aforementioned publication indicate that to date no human health problems have been observed nor disease patterns detected which are attributable or related to fluorochemical exposure. This publication also describes the industrial hygiene measures undertaken in further reducing employee exposure.

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"N-ethyl perfluorooctylsulfonamido ethanol and N-ethyl perfluoroheptylsulfonamido ethanol" is the specific chemical description for two homologs reported under the TSCA inventory as designated by CAS Numbers 1691-99-2, and 68555-73-7. The mixture of these two chemicals is designated as in the attached reports, an intermediate used by 3M in the production of various finished fluorochemicals products sold by 3M. Since it is an intermediate, these chemicals may be present in various finished fluorochemical products as trace impurities. Approximately of these two alcohols are produced per year at our Decatur, Alabama plant involving 120 people potentially exposed on an intermittent basis. Chemical reaction occurs in a closed system.

We plan to inform, by mid-December, all those 3M employees who have a potential of significant exposure to the subject chemicals, summarizing these findings and outlining our recommendations for handling and using these chemicals. We are by copy of this letter advising NIOSH of these new but preliminary teratogenic findings. When significant new information becomes available to us, we plan to advise those employees accordingly.

In line with our ongoing testing and monitoring program on fluorochemicals, this is to advise the Agency of the following work planned for initiation in the near future:

(1) A second teratogenic study designed to further evaluate these findings in both rats and rabbits.
(2) Lifetime feeding studies in rats.
(3) Developing industrial hygiene procedures designed to further reduce the exposure to plant employees.

Since certain of the information provided herein is considered confidential business information, we are providing a sanitized version of this report for the public file. In addition, we have deleted from the confidential submission inconsequential information such as the names of 3M employees for the purpose of protecting their privacy.

At such time that the teratogenic study is completed, a final written report will be provided pursuant to this submission. In the interim should additional correspondence be necessary on this matter, please contact:

Larry Magill
Manager, Regulatory Affairs Department
Commercial Chemicals Division
3M
3M Center, 223-6S 04
St. Paul, MN 55144
Phone No. (612) 733-7062

Yours truly,

L. D. DeSimone
Group Vice President

dea

Attachments

c: Anthony Robbins, M. D.
Director, NIOSH
Park Lawn
5600 Fishers Lane
Rockville, MD 20855

TITLE: Protocol for Oral Teratology Study of in Rats
(Experiment Number 0680TR0010).

OBJECTIVE: A teratology study will be used to evaluate the embryotoxic and teratogenic effects of orally administered to pregnant rats during the period of organogenesis. The procedure complies with the general recommendations of the FDA issued in January, 1966 ("Guidelines for Reproduction Studies for Safety Evaluation of Drugs for Human Use"). The study will be conducted according to the 1978 Good Laboratory Practice regulations and Safety Evaluation Laboratory's Standard Operating Procedures.

SPONSOR: 3M Commercial Chemical Division, St. Paul, Minnesota.

TESTING FACILITY: Safety Evaluation Laboratory
St. Paul, Minnesota.

STUDY DIRECTOR:

START OF DOSING: Mid August, 1980.

TEST SYSTEM: Eighty-eight sexually mature, time mated Sprague-Dawley derived female rats from Charles River Breeding Laboratory will be housed in hanging stainless steel cages with wire mesh floors and fronts in a temperature and humidity controlled room. This strain of rats will be used because of historical control data and time mated females are readily available. Purina Laboratory Chow and water will be available ad libitum. The lights will be on a 12 hour light/dark cycle.

TEST SYSTEM IDENTIFICATION: Each animal will be ear tagged and that number will be indicated on the outside of the cage.

RANDOMIZATION: The animals will be assigned cages according to a computer-generated random number table.

CONTROL ARTICLE: Corn oil.

TEST ARTICLE:

ANALYTICAL SPECIFICATIONS: The test article, composition and purity will be determined by the Sponsor (3M Commercial Chemical group) prior to the start of the study and at the end of dosing.

DOSAGE LEVELS AND EXPERIMENT DESIGN: The test article will be suspended in corn oil daily. The test article suspension and control article will be administered by oral intubation to the rats on days 6 through 15 of gestation according to the following:

Dose Group	Dose Level	Group Size
High	75 mg/kg/day	22 ♀
Mid	37.5 mg/kg/day	22 ♀
Low	25 mg/kg/day	22 ♀
Control	0 mg/kg/day	22 ♀

The oral route of administration will be used because toxicity has been defined by this route in a rangefinder study. No dietary contaminants are known to interfere with the test article.

The animals will be observed daily from day 3 through day 20 of gestation for abnormal clinical signs. Body weights will be recorded on days 3, 6, 9, 12, 15 and 20 of pregnancy and the rats dosed accordingly using a constant dose volume of 5 ml/kg of body weight.

The females will be killed on day 20 and the ovaries, uterus and its contents will be examined to determine: number of corpora lutea, number of fetuses (live and dead), number of resorption sites, number of implantation sites, pup weight and gross abnormalities. Approximately one-third of the pups will be fixed in Bouin's solution for subsequent free-hand sectioning by the Wilson technique to determine any visceral abnormalities using a dissecting microscope. The remaining approximately two-thirds of the pups will be fixed in ethyl alcohol for subsequent skeletal examination after clearing and staining with alizarin red.

DATA ANALYSIS AND FINAL REPORT: The proposed statistical methods to be used for analysis of the data are: Dunnett's t test for dam and pup weights, number of fetuses, number of resorption sites, number of implantation sites and number of corpora lutea; Chi-square for percent abnormalities. The proposed date for the final report is 2-3 months after detailed pup examinations have been completed (approximately first quarter, 1981).

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Date

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Date

PAGE 0007

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November 12, 1980

cc:

TO:

FROM:

SUBJECT: Teratogenicity of Two Fluorochemical [illegible]unds in Rats
(Study numbers 680TR0008 and 680TR0010)

Preliminary results from rat teratology studies on . and indicate a teratogenic effect on the embryonal eye. The developmental eye abnormality was seen at all dose levels except the control groups. The range of morphological appearances observed under the dissecting microscope varied from a slight discoloration on the lens near the anterior margin to a dark colored oval area, often containing a cleft, extending from beneath the lens epithelium to halfway through the lens posteriorly. Histologically, the discolorations were primarily due to the presence of lens vesicle remnants or abnormal primary lens fibers in the embryonal nucleus of the lens. In addition to the developmental eye abnormalities observed, the high and mid dose groups had fetuses with cleft palates and sternebrae changes.

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