

MAR 16 1963

K. L. ...

March 14, 1963

TO: Members of the Personal Products Standard Methods Sub-Committee
Aerosol Division
Chemical Specialties Manufacturers Association

At the December meeting in Washington, considerable concern was expressed by members of this Committee about the toxicity potentials of some of the newer propellant mixtures, such as those containing vinyl chloride, and of vapor pressure depressant additives, such as methylene chloride, chlorethene, and trichloroethylene.

As a result of the discussion, certain members of the Committee volunteered to submit toxicological information on some of these propellants or additives that might be available from their companies. Appreciation is expressed for the enclosed copy of a letter and memorandum on this subject provided by R. J. Scott of Union Carbide. If there are any specific questions regarding this information, it is suggested that Bob Scott be contacted directly.

Since the CSMA May meeting is only about two months away, I would appreciate your sending to my attention any special subjects or needs for new methods that should be placed on our agenda. I shall look forward to seeing all of you at our forthcoming meeting.

Steve Goff

S. R. Goff
Chairman

SRG:jlh
Enclosure

ASI 000015726



UNION CARBIDE CHEMICALS COMPANY

DIVISION OF UNION CARBIDE CORPORATION

SAW MILL RIVER ROAD AT ROUTE 100C, P. O. BOX 65, TARRYTOWN, NEW YORK

TECHNICAL SERVICE
LABORATORY

December 12, 1962

Mr. S. R. Goff, Chairman
CSMA Personal Products Subcommittee
c/o Toni Company
Merchandise Mart
Chicago, Illinois

Dear Steve:

In response to your request at the CSMA meeting last week for information on the toxicology of vinyl chloride, I am sending you the enclosed memorandum which was prepared by Dr. T. W. Nale, Medical Director of Union Carbide Corporation. The information contained in Dr. Nale's memorandum has been submitted to the FDA, and as I mentioned at the meeting, the FDA has informed us that they would not disapprove a product because it contains the UCON Vinyl Chloride propellant blend. This does not, however, exempt the product from FDA requirements.

Extra copies of this letter and Dr. Nale's memorandum are enclosed for distribution to the subcommittee members, if you so desire.

Very truly yours,

R. J. Scott/bm
Enclosure

ASI 000015727

March 7, 1962

VINYL CHLORIDE

Vinyl chloride (monochlorethylene) has been used and handled safely for many years in industry. It is gaseous at ordinary temperatures and has a weak sweetish odor. It has a very slight irritating effect and is narcotic in its action. At one time it was suggested as an anesthetic agent. According to Schaumann¹, the narcotic limiting concentration for humans is 7 - 10 vol. % (70,000 - 100,000 p.p.m.), and above 12 vol. % (120,000 p.p.m.) it is dangerous. After absorption, vinyl chloride is eliminated very quickly and is not cumulative.

In the published list of Threshold Limit Values for 1961 as adopted by the American Conference of Governmental Industrial Hygienists, 500 parts per million is given as the concentration of vinyl chloride in air considered safe for an eight-hour exposure.

Most of the studies of the toxicity of vinyl chloride have consisted of acute and subacute exposures of small animals. These are not considered adequate as a basis for conclusions as to possible chronic effects, although human cases of chronic poisoning have not been reported. In some twenty-five years of experience in our own chemical industry, we are not aware of any human poisonings due to exposure to vinyl chloride.

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A report on "The Toxicity of Vinyl Chloride as Determined by Repeated Exposure of Laboratory Animals" by T. R. Torkelson, F. Oyen, and V. K. Rowe was published in the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION JOURNAL (Vol. 22, No. 5, pp. 354-361, October, 1961). In this study groups of

laboratory animals were exposed up to six months to either 500, 300, 100, or 50 p.p.m. of vinyl chloride in air. Detectable changes occurred at all but the lowest concentration. It is of interest that the only effect noted after daily seven-hour exposures to 100 p.p.m. for six months was a slight increase in the average weight of the rat livers. The effects noted in animals at 500 p.p.m. were only slight to moderate; growth, mortality, and general appearance were unaffected. The data presented in this article indicate that there is little likelihood of injury to be expected if repeated daily seven-to-eight-hour exposures are limited to 100 p.p.m. or less.

Application as an Aerosol Propellant

In the proposed application and usage as an additive to an aerosol propellant, the suggested mixture is 22% vinyl chloride and 78% of a 50/50 mixture of fluorocarbons 11 and 12. The following calculation was made of an exaggerated condition:

A 16-ounce container of a hair spray would contain 70% of the propellant mixture, or 11.2 ounces. Of this, 22%, or 2.46 ounces, is vinyl chloride. This corresponds to 67,618 milligrams.

The entire contents are sprayed into a room of 15' x 15' x 9', or 2,025 cubic feet, which equals 58,317.5 liters.

67,618 milligrams divided by 58,317.5 liters equals 1.1 milligrams of vinyl chloride per liter of air. One milligram of vinyl chloride per liter is equal to 391 parts per million. One and one-tenth times 391 gives 430 parts per million, the concentration of vinyl chloride in such a room.

This concentration is very far below the 70,000 to 100,000 p.p.m. necessary to produce an anesthetic effect. It is below the presently accepted threshold limit of 500 p.p.m. In actual use such a spray would be applied only in bursts and not continually. It would seem that there is a large factor of safety.

Vinyl chloride would not be a skin irritant because the liquid would evaporate rapidly if it were spilled on the skin. Its use in industry has not indicated it to be a causative factor in production of skin sensitizations. Since it is gaseous at normal temperatures, test procedures such as patch tests are not practicable.

To prevent polymerization, 25 parts per million of methyl ether of hydroquinone are added to the vinyl chloride used in the propellant mixture. This is a very small amount, especially when it is considered that only 2.46 ounces of vinyl chloride might be used in a 16-ounce containers. It would be approximately 1.84 milligrams in the 2.46 ounces of vinyl chloride. Our laboratories have found the single oral LD₅₀ dosage to rats of methyl ether of hydroquinone to be 1.63 grams per kilogram. It is also of interest that in the Landsteiner intradermal test on guinea pigs no sensitization was produced.

ASI 000015730

Thomas W. Nale, M. D.

REFERENCE

- 1 K. B. Lehmann and F. Flury, TOXICOLOGY
AND HYGIENE OF INDUSTRIAL SOLVENTS,
The Williams and Wilkins Company, Baltimore,
1943, page 171.

ASI 000015731