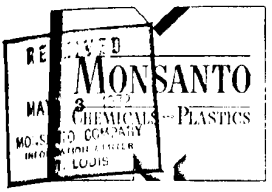
Plasticizer



ORTHO-NITROBIPHENYL
(Toxicity Data)

Monsanto Technical Bulletin No. 0-D-700

August 10, 1951

Development Dept., Organic Chemicals Division
Monsanto Chemical Co., St. Louis 4, Mo.

GENERAL STATEMENT

The following data pertaining to the toxicity of Ortho-Nitrobiphenyl are based on reports which have appeared in "The Journal of Industrial Hygiene and Toxicology".(1) Tests on rats and rabbits, as experimental animals, show that Ortho-Nitrobiphenyl is toxic to the following extent:

> A single, lethal, oral dose (LD_{50}), administered as a 25% solution in olive oil is 1.23 grams per kilogram for rats and 1.58 grams per kilogram for rabbits. Indicative of the fact that the method of preparing the compound for administration has a marked influence on the rate and extent of its absorption, the LD_{50} in the case of a 30% suspension of Ortho-Nitrobiphenyl in 1.5% aqueous methyl cellulose, administered orally, is 4.11 grams per kilogram for rabbits.

EFFECT ON THE SKIN

Repeated application of Ortho-Nitrobiphenyl (as a 25% solution in olive oil) to the abdominal skin of rabbits induces no signs of local irritation nor does it appear to cause systemic illness.

Patch tests on a group of 200 individuals, in which the Ortho-Nitrobiphenyl was applied as a 5% solution in Acetone, resulted in no positive reactions. The conclusion drawn is that according to the test and applying the material as a 5% solution in Acetone, Ortho-Nitrobiphenyl is neither a primary irritant nor does it appear to be a sensitizing agent.

(1)The Journal of Industrial Hygiene and Toxicology, Vol. 29, No. 1, pp. 1-13, Jan., 1947.

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Furthermore, nothing contained herein shall be construed as a recommendation to use any product in conflict with existing patents covering any material or its use.

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INHALATION

Inhalation experiments indicate that vaporized Ortho-Nitrobiphenyl is not safe in a concentration of 0.3 to 0.5 milligrams per liter of air. The maximum safe concentration has not been determined.

EFFECT OF LETHAL DOSES

The administration of single, lethal, oral doses of Ortho-Nitrobiphenyl to rats and rabbits caused unsteadiness, an increased rate of respiration, marked muscular weakness, dyspnea, and death in coma in from one to eighteen days.

SUGGESTED INTERPRETATION

ONB possesses some degree of toxicity, but this makes it by no means unique when plasticizers and solvents are considered in general. The toxicity is of the same order as that of tricresyl phosphate and triphenyl phosphate.

The ingestion of Ortho-Nitrobiphenyl or the inhalation of vapor, mist or dust must be avoided through proper engineering and safety measures incident to good housekeeping. Finished formulations which may be doubtful as to their ultimate application should be tested, and contact with food or other possible avenues of ingestion should be avoided unless properly designed tests prove that such an application is safe.

Each new use requires careful consideration not only of the new product but its use and conditions of use. The inherent properties of Ortho-Nitrobiphenyl indicate that it is worthy of serious consideration in plasticizer applications.

In the event that this statement does not cover a particular case, we shall be glad to expand upon it in detail upon request and within the limitation of the available data.

The data set out herein is from reports received by us. We believe in the competency of the investigators but interpretation and a proper use of toxicological data to suit not only the product but a given set of conditions are essential and must be made by the user.

law:wa-750-851 Printed in U.S.A.

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