Monsanto INDUSTRIAL CHEMICALS CO.

FROM (NAME & LOCATION): R. H. Munch - St. Louis General Offices - T1B

DATE: March 7, 1974

cc: W. R. Richard - T3A
Q. E. Thompson - T3B
P. G. Benignus - B2SC

SUBJECT: TOXICITY OF HEXACHLOROBUTADIENE

REFERENCE:

TO: H. A. Vodden
Louvain-la-Neuve

Your February 1974 Environmental Monthly progress report states that Brush Electrical has asked for help in opposing the use of hexachlorobutadiene (HBD) in transformer fluids because of its toxicity. I believe that Bill Richard has already sent you two pieces of data on this subject.

1) A report by Younger Laboratories on Monsanto Project Number Y-67-55, Sample Number 65

2) A copy of a letter and an accompanying preliminary data sheet on hexachlorobutadiene from Mr. R. A. Miller of Hooker Industrial Chemicals.

The data in (1) do not make use of HBD seem too bad; those in (2) suggest that it would be highly imprudent to use the material. I have therefore looked for more information.

It turns out that HBD is frequently found associated with hexachlorobenzene which is under investigation in this country because of the fact that flesh of meat animals from parts of Louisiana, Texas, California and Colorado has been found to be so highly contaminated that it is unfit for human consumption. Excerpts from a report by Midwest Research Institute to the Environmental Protection Agency are attached. Reading these, you will note the following concerning HBD:

1) It was considered important enough as a toxic substance to include in this study.

2) That it is a by-product of a variety of industrial chlorination processes.

3) There are no significant uses of HBD in this country.

4) That it is considered highly toxic, capable of producing severe kidney damage in test animals.

5) Several references to toxicity studies are given. A copy of parts of one of these, The Subacute Inhalation Toxicity of 109 Industrial Chemicals by J. C. Gage of Imperial Chemical Industries, is also enclosed. This gives a "Provisional Operational Limit" for safe use of HBD as 1 ppm. We note that Chem Abstract 72-97852b states that HBD is toxic to Daphnia magna and Leucaspius delineatus, causing fish to die even after transfer to clean water. Concentration levels given in this reference should be checked since they are given in mg/liter in one place and mg/ml in the other. The original Chem Abstract reference contains the same discrepancy.

6) All companies which have by-product HBD dispose of it by incineration, cracking, deep well injection or in land fills.

My conclusion from all this is that HBD is, like other chlorinated hydrocarbons, much more toxic by inhalation or skin absorption than by ingestion. The fact that its boiling point is about 110°C lower than Aroclor 1242 would make it easier to achieve toxic levels in air in confined spaces so that danger of poisoning by inhalation would be greater. HBD is a water insoluble, lipid soluble, material which is toxic to aquatic organisms such as daphnia and fish. It would probably be as bad as, or worse than, PCB's in this respect. The data would seem to indicate that it would be much safer to continue use of the chlorinated biphenyl and chlorinated benzene materials.

R. H. Munch

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