

July 23, 1969

Mr. A. Bruce Pyle
Assistant Bureau Chief
Department of Conservation
and Economic Development
P. O. Box 1809
Trenton, New Jersey

Dear Mr. Pyle:

In connection with your recent request for more specific information on PCB, I have enclosed several items that may be of interest.

The first is a table showing the physical characteristics and properties of our Aroclors, the trade name for our polychlorinated biphenyls.

The numerical designation of these materials is meaningful. The 1200 series are biphenyls chlorinated to the extent indicated by the last two numerals. For example, Aroclor 1242 is biphenyl chlorinated to the extent of 42%; Aroclor 1254 is biphenyl chlorinated to 54%.

The 5400 series are terphenyls chlorinated to the extent of the last two numerals. Thus Aroclor 5460 is terphenyl chlorinated to 60%. The 2500 and 4400 materials are mixtures of biphenyls and terphenyls chlorinated to 65%.

We have typed on the bottom of the table the results of acute toxicity studies. These indicate the approximate lethal dose in rats when administered orally and the minimum lethal dose when the samples were applied to the unbroken skin of rabbits. You will note that the samples were administered undiluted or as various concentrations in corn oil depending on the physical form and solubility of the sample.

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The second enclosure refers to the only published data that we now have concerning possible toxicity to fish. This enclosure is a 1957 report from the U. S. Fish and Wildlife Service showing the results of studies to determine the possible effects of chemicals to larval lampreys and fishes. The enclosure includes a copy of the title page, the page explaining the table and that portion of the table which indicates that four of the Aroclors have no effect on trout, bluegill and larval lampreys at a concentration of 5 ppm in a 24 hour test period.

The only chronic toxicity data that we have refers to the inhalation of vapors of Aroclor 1242 and 1254. Enclosure three is a reprint describing the chronic inhalation studies and enclosure four is a Hygiene Guide published by the American Industrial Hygiene Association which prescribes safe handling techniques for the use of these materials in industry.

Based on available data, manufacturing and use experience, we do not believe the polychlorinated biphenyls to be seriously toxic. At the same time we have also recommended precautions to avoid repeated and prolonged skin contact and secondary avoidance of inhalation of vapors when the materials are heated. As indicated by the distillation ranges in enclosure one, these products have extremely low vapor pressure and thus present little vapor inhalation hazard at ambient temperatures.

I don't know that I can add a great deal to your question to the use of these materials without repeating the comments in the statement which Tom Ford sent you. Their dielectric characteristics lead to usage as insulating fluids for transformers and capacitors. Transformer application is in sizes applicable to sub-stations rather than the small transformer on lines for reducing voltage for household use.

The plasticizer type application PCB's are incorporated into a polymer as an integral part of the solid material. This is the case whether the polymer is then used as an adhesive special elastomer or individual surface coating.

Contrary to some reports from the press, the PCB's are not used in rubber tires, lipstick, or the common plastic containers or films used for industrial or household packaging.

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We have a considerable research effort underway to determine the toxicity of several of the PCB's in rats and dogs. We are also including three generation reproduction studies in rats. Also underway are studies with fowl to determine the possible chronic effect on the birds themselves, egg size and production, hatchability of the eggs and viability of the chicks. We will also do studies to determine any possible effect on egg shell thickness and calcium and phosphorus metabolism.

We have attempted to establish a program for determination of the possible biodegradation of the polychlorinated biphenyls but research of this type is not yet underway.

Re-emphasizing a point we attempted to make in the statement Tom sent you, we are unable at this time to conceive of how the PCB's can become wide spread in the environment. It is certain that no applications to our knowledge have been made where the PCB's would be broadcast in the same fashion as the chlorinated hydrocarbon pesticides have been. I am sure there will be much more research undertaken to clarify some of the questions that early research efforts have raised and you may be sure that we will participate in a number of these.

If I can be of any further assistance after you have reviewed this letter and the enclosures, please let me know.

Sincerely,

Elmer F. Wheeler
Manager, Environmental Health

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