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CHEMICAL MANUFACTURERS ASSOCIATION



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GERALDINE V. COX, Ph.D.
Vice President
Technical Director

September 19, 1984

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FYI-0794-000926

Mr. Arthur Stern
Executive Secretary
Interagency Testing Committee
TS-792
Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

Dear Mr. Stern:

On behalf of the Chemical Manufacturers Association's Rubber Additives Program Panel, I am enclosing comments on EPA's Chemical Hazard Information Review on mercaptobenzothiazole. The Panel would welcome the opportunity to meet with the ITC to discuss these comments.

Please call Robert J. Fensterheim of my staff (202-887-1189) for any additional information.

Sincerely,

Geraldine V. Cox

Enclosure

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COMMENTS ON THE MERCAPTOBENZOTHAZOLE INFORMATION REVIEW

Submitted to the
INTERAGENCY TESTING COMMITTEE
and the
ENVIRONMENTAL PROTECTION AGENCY

by the
CHEMICAL MANUFACTURERS ASSOCIATION
Rubber Additives Program Panel

September 19, 1984

Summary of Concerns

The Chemical Manufacturers Association's Rubber Additives Program Panel has reviewed the Mercaptobenzothiazole Information Review dated December 30, 1983, submitted by CRCS, Inc., Reston, VA to EPA's TSCA Interagency Testing Committee (ITC). The Panel continues to be concerned about the lack of critical scientific review which can lead to speculative conclusions that are not supported by data. Much of the information cited is from abstracts or Eastern European and Russian articles which generally are not peer-reviewed to assure scientific validity. It is difficult to evaluate this information since the methods and primary data are not presented. The Panel believes that a more careful, critical review and evaluation of these results should be conducted before the conclusions are relied upon by the ITC and EPA.

A second area of concern is the information and conclusions offered on exposure and environmental release. These sections of the Information Review rely heavily on a review document (Santodonato, 1976) which does not reflect current advances in manufacturing technology and workplace practices or current product usage. Several of the specific comments which follow note the difference between current use and statements made in the review.

The Rubber Additives Panel hopes that the following specific comments will be helpful to the ITC and the EPA in their evaluation and assessment of the data and conclusions presented in the MBT Information Review.

Specific Comments

The following comments are listed by Section, page and paragraph of the Information Review.

Overview - Summary of Hazard Potential

Page vi, Paragraph 1:

The statement that "Sizable quantities of mercaptobenzothiazole compounds are released to the environment" is a gross generalization which is not supported by quantitative values.

Chemical and Physical Information - Exposure Estimates - Production

Page 2, Line 3:

Mercaptobenzothiazole is produced at The Goodyear Tire & Rubber Co., Chemical Division, Akron, Ohio, not Niagara Falls, New York.

Page 4, Paragraph 1:

Although the statements made in this paragraph are correct, it should be noted that major advancements in tire technology and compounding have resulted in tires with a more extended period of tread-life.

Chemical and Physical Information - Exposure Estimates - Use

Page 6, Paragraph 3:

Based on information available to the CMA Panel members, MBT is not now generally used in the production of automobile and small truck tires, which represents the largest tire market in the United States.

Chemical and Physical Information - Exposure Estimates - Occupational Exposure

Page 7, Paragraph 2:

The work of Taft and Stroman fails to consider the effect of morpholine or of a morpholino - MBT accelerator which has been shown to be a sensitizer in human studies. The industrial experience of several companies does not indicate a problem with irritation/sensitization potential for MBT from exposures encountered in the workplace. Studies conducted with animal and human patch tests did not provide any evidence for a primary irritation/sensitization activity for MBT (Monsanto Company, unpublished report).

Chemical and Physical Information - Exposure Estimates - Comment

Page 7, Paragraph 3:

The statement that worker exposure "should occur" is misleading. Current workplace practices throughout the chemical industry provide appropriate protective equipment to minimize or completely eliminate exposure.

Chemical and Physical Information - Exposure Estimates - Comment

Page 8, paragraph 1:

Human exposures to MBT from use of consumer products have not been reasonably demonstrated. Therefore, the statement that consumers are expected to be exposed should either be deleted or necessary supporting data provided.

Chemical and Physical Information - Releases

Page 9, Paragraph 2 and 4:

The statements made in these two paragraphs are speculative and are not supported by data. Leaching of a material from an article is dependent on factors such as pH, temperature, solubility, availability of the material in the article, and surface area of the article. Environmental releases of MBT resulting from the leaching of discarded tires and rubber products have never been demonstrated. Even if releases did occur, it would be minimal due to the unavailability of free MBT. MBT or MBT based accelerators generally become irreversibly bound to the vulcanized rubber. In the case of an efficient low sulfur curing system, this bonding is considerable. Furthermore, any remaining free accelerator would be entrapped within the rubber network.

Biotransformation

Page 11, Figure

S³⁵O in the figure should read ³⁵SO

Genotoxicity

Page 12, Paragraph 3:

Revazova (1968) is cited on p. 12 and in the references. However, the information presented in the Information Review is not taken from the original article but from a previous review document (NTIS PB-256 662, 1976). Where possible, CMA encourages the ITC and EPA to review original articles.

Teratogenicity, Embryotoxicity and Fetotoxicity

Page 13, Paragraphs 1,2,3:

Studies by Korhonen et al (1982 and 1983), using 3-day chicken embryos, appear to indicate that MBT produces embryotoxicity and malformations when injected into eggs. This, however, does not answer the critical question regarding the bioavailability of MBT to the mammalian fetus in vivo. Since many factors such as dose, route of exposure, metabolism and species differences can influence the ability of a chemical to cross the placental barrier, only in vivo mammalian studies can provide insight into the teratogenic, embryotoxic and fetotoxic potential of a chemical. Therefore, the effects noted in the chicken embryo should not be considered an indication of embryotoxicity in mammalian species.

In vivo dominant lethal studies in rats have been conducted by Aleksandrov (1974 and 1982). Embryotoxicity and pre- and post- implantation losses were noted in both studies. These two reports appear to be separate and distinct studies and not simply a republication of old data. The available detail of the methodology in the 1974 paper and the presentation of data in both is limited.

The referenced reproductive and teratology study on MBT by Hardin et al (1981) is a summary report without a conclusive presentation of data. The results need to be cautiously considered since i.p. route of exposure may subject the chemical to completely different metabolic handling than the more realistic inhalation or oral routes.

Reproductive Effects

Page 15, Paragraph 1:

Lehman (1965) is reported as "Studies by ---". This is inaccurate. The data is actually a summary of unpublished data (1957) from Niagara Chemical Division, Food Machinery and Chemical Corporation.

Environmental Information - Environmental Entry and Concentrations - Environmental Release

Page 17, Paragraph 1:

MBT is manufactured in a closed, continuous system. Any environmental releases would be accidental or incidental; consequently, there would be no duration of release of the product into the air or water. Packaging and end-product processing would be controlled by workplace practices which are designed to protect the worker and the environment. MBT will readily complex with various metal ions forming salts; consequently, there would be adequate removal of MBT and its salts by the primary or secondary effluent systems routinely utilized by industry and publicly owned treatment works.

Page 17, paragraph 2:

There is no supporting data to indicate that MBT will readily leach into water from discarded rubber products. (See more extensive discussion on page four relating to "Chemical and Physical Information Releases".)

Environmental Information - Environmental Entry and Concentration -
Environmental Concentration

Page 18, Paragraph 1:

It should be noted that MBT is chemically degradable, thus the levels of MBT indicated here are not significant and would not represent any environmental concern. Furthermore, results from an unpublished study by Monsanto indicate that sunlight photolysis of a 1.1 ppm MBT aqueous solution has a half-life of 3.7 hours at midday in August (Monsanto Company, unpublished report). In the dark, MBT has a half-life in aqueous solution of about 100 hours.