

US EPA ARCHIVE DOCUMENT



R.E.D. FACTS

Sodium and Zinc Salts of 2-Mercapto- benzothiazole

Pesticide Reregistration

All pesticides sold or distributed in the United States must be registered by EPA, based on scientific studies showing that they can be used without posing unreasonable risks to people or the environment. Because of advances in scientific knowledge, the law requires that pesticides which were first registered years ago be reregistered to ensure that they meet today's more stringent standards.

In evaluating pesticides for reregistration, EPA obtains and reviews a complete set of studies from pesticide producers, describing the human health and environmental effects of each pesticide. The Agency imposes any regulatory controls that are needed to effectively manage each pesticide's risks. EPA then reregisters pesticides that can be used without posing unreasonable risks to human health or the environment.

When a pesticide is eligible for reregistration, EPA announces this and explains why in a Reregistration Eligibility Decision (RED) document. This fact sheet summarizes the information in the RED document for reregistration case 2380, the sodium and zinc salts of 2-mercaptobenzothiazole.

Use Profile

This case includes two active ingredients, the sodium and zinc salts of 2-mercaptobenzothiazole, which are used as fungicides, microbiocides and bacteriostats. These salts are used as preservatives for adhesives, latex and oil paints, paper products, metal working cutting fluids and textile fibers.

Sodium 2-mercaptobenzothiazole is used in the form of a soluble concentrate or liquid to control mold, mildew, bacteria and fungi which cause aqueous industrial products to degrade. The metal working cutting fluid use of the sodium salt of 2-mercaptobenzothiazole is the only use pattern where effluent containing the chemical is discharged into aquatic environments, potentially exposing non-target aquatic organisms, including endangered species. This use pattern exceeds the acute Level of Concern (LOC) for endangered aquatic organisms. The Agency, therefore, has determined that effluent containing sodium 2-mercaptobenzothiazole should

not be discharged into streams and other waterways where endangered aquatic organisms are known to reside. When the Agency completes its Endangered Species Program, additional precautionary labeling may be required to mitigate the risk to endangered species.

Zinc 2-mercaptobenzothiazole is used in the form of a soluble concentrate or liquid and wettable powder to control mold, mildew, bacteria and fungi which degrade aqueous industrial products, fabrics, and yarns; and slime-forming bacteria and fungi in industrial water systems.

There are no registered food uses for either the sodium or zinc salts of 2-mercaptobenzothiazole.

Regulatory History

Sodium 2-mercaptobenzothiazole was first registered as a pesticide in the United States in 1949 in an industrial preservative product. Currently, only one product is registered, for use in wood and paper/paperboard treatment and as a preservative in metal working cutting fluids, emulsions, textiles and pastes.

Zinc 2-mercaptobenzothiazole was first registered as a pesticide in the United States in 1955 in an industrial preservative product. Currently, two products are registered for use as preservatives in adhesives, textiles, paints, coatings and paper products.

The parent compound, acid of 2-mercaptobenzothiazole, was registered as a pesticide active ingredient in 1956. However, all products containing that chemical have since been canceled.

Human Health Assessment

Toxicity

Zinc 2-mercaptobenzothiazole has been placed in Toxicity Category III, which indicates moderate to low acute toxicity, for acute skin and eye effects. However, the sodium salt is placed in Toxicity Category I, indicating the highest degree of acute toxicity, for skin and eye effects because it is extremely acidic (with a Ph of 11.5).

The acid of 2-mercaptobenzothiazole is classified as a non-quantifiable "Group C" carcinogen; a possible human carcinogen. A linear, multi-stage model for cancer risk assessment was not appropriate because the use of this pesticide is not likely to result in repeated human exposure over a significant portion of the human life span. Margins of Exposure (MOEs) were calculated to quantify the risk to applicators/mixers/loaders. The MOEs for the preservative and metal working cutting fluid uses of zinc and sodium 2-mercaptobenzothiazole exceed 100 (the margin considered acceptable) by several orders of magnitude. Therefore, additional exposure studies were not warranted, and the Agency required data on acute, developmental and subchronic toxicity and mutagenicity only.

Occupational and Residential Exposure

The methods of application for products containing sodium or zinc 2-mercaptobenzothiazole that include open pouring of liquid concentrate,

and open pouring of powder into adhesives and paints, present the potential for dermal and inhalation exposure to applicators. Dermal exposure is the primary route of exposure of sodium and zinc 2-mercaptobenzothiazole.

EPA was concerned about the risks of dermal and inhalation exposure associated with the application of sodium 2-mercaptobenzothiazole for the metal working cutting fluid use, and required a dermal exposure study to assess the risks to workers. The study was designed to reflect typical work practice involving the biocide in industrial use. The final assessment of the study indicated that some absorption into the skin occurred. However, since there are no special toxicological concerns about the sodium or zinc salts, EPA is not imposing Personal Protective Equipment (PPE) requirements on use of the products.

Post-application exposure from treated paint, adhesives, textiles and other treated industrial products are not considered significant because of the low concentration/dilution factor to the treated products. There are no residential uses of sodium or zinc 2-mercaptobenzothiazole. Therefore, the potential for any significant residential exposure is very low.

Human Risk Assessment

The sodium and zinc salts are not registered for any food or feed related uses, so no dietary risks are posed. The potential for residential exposure and risk is very low.

Workers (mixers, loaders and applicators) may be exposed to these pesticides, especially during open pouring of liquid and powder formulations. However, the Agency has determined that use of these pesticides is not likely to result in repeated human exposure over a significant portion of the human life span. The establishment of active ingredient based PPE requirements is not warranted at this time. The PPE for pesticide handlers will be based on the acute toxicity of the end-use product.

Environmental Assessment

Environmental Fate

A hydrolysis study has been required on the technical grade of sodium 2-mercaptobenzothiazole for industrial use products where effluent is potentially discharged into aquatic environments. While the Agency has required the study to be based on the industrial use pattern, major environmental exposure to the sodium salt is not expected. The Agency will use the results of the study to confirm this assessment and the degradation rate of the active ingredient and products formed during hydrolysis.

Ecological Effects Risk Assessment

2-Mercaptobenzothiazole is almost nontoxic to birds on an acute oral basis and is only slightly toxic to birds on a dietary basis. However, it is highly toxic to freshwater fish and moderately toxic to aquatic invertebrates. The use patterns of the sodium and zinc salts, except for sodium

2-mercaptobenzothiazole's use in metal working cutting fluids, indicate that they will not pose risks to avian and aquatic species.

Unlike agricultural situations, where aquatic organisms can be exposed to pesticides via runoff or spray drift, nontarget aquatic organisms would be exposed to industrial microbiocides through a point source discharge. The metal working cutting fluids use of the sodium salt is the only use pattern which may result in an effluent discharge into aquatic environments. It therefore poses the potential for exposure to nontarget aquatic organisms, including endangered species.

EPA's aquatic risk assessment indicates that minimal risk is posed to freshwater aquatic organisms in receiving streams at mean flow rates. However, under high exposure conditions, a high acute and chronic risk is posed to freshwater aquatic organisms. The high exposure scenario also exceeds the LOC for endangered freshwater fish and invertebrate species. Therefore, effluent containing sodium 2-mercaptobenzothiazole should not be discharged into streams and other waterways where endangered aquatic organisms are known to reside.

Additional Data Required

A hydrolysis study has been required to confirm the environmental assessment by determining the degradation rate of sodium 2-mercaptobenzothiazole and products formed during hydrolysis. EPA also is requiring product-specific data including product chemistry and acute toxicity studies, revised Confidential Statements of Formula (CSFs), and revised product labeling for reregistration of products containing sodium or zinc salts of 2-mercaptobenzothiazole.

Product Labeling Changes Required

The labels of all registered pesticide products containing sodium and zinc salts of 2-mercaptobenzothiazole must comply with EPA's current pesticide labeling requirements. The following statement also must appear on the labels of sodium 2-mercaptobenzothiazole end use products with the metal working cutting fluid use:

Effluent Discharge Labeling Statement - "Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA."

When the Agency completes the Endangered Species Program, additional precautionary labeling may be required to mitigate the risk to endangered species.

**Regulatory
Conclusion**

The use of registered products containing sodium or zinc salts of 2-mercaptobenzothiazole will not pose unreasonable risks or adverse effects to humans or the environment, provided that these products are used in accordance with the restrictions on product labeling. Therefore, all uses of these products are eligible for reregistration. Sodium or zinc salts of 2-mercaptobenzothiazole products will be reregistered once the confirmatory generic data, the required product-specific data, Confidential Statements of Formula and revised labeling are received and accepted by EPA.

**For More
Information**

EPA is requesting public comments on the Reregistration Eligibility Decision (RED) document for sodium and zinc salts of 2-mercaptobenzothiazole during a 60-day time period, as announced in a Notice of Availability published in the Federal Register. To obtain a copy of the RED document or to submit written comments, please contact the Pesticide Docket, Public Response and Program Resources Branch, Field Operations Division (7506C), Office of Pesticide Programs (OPP), US EPA, Washington, DC 20460, telephone 703-305-5805.

Following the comment period, the sodium and zinc salts of 2-mercaptobenzothiazole RED document will be available from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161, telephone 703-487-4650.

For more information about EPA's pesticide reregistration program, the sodium and zinc salts of 2-mercaptobenzothiazole RED, or reregistration of individual products containing sodium and zinc salts of 2-mercaptobenzothiazole, please contact the Special Review and Reregistration Division (7508W), OPP, US EPA, Washington, DC 20460, telephone 703-308-8000.

For information about the health effects of pesticides, or for assistance in recognizing and managing pesticide poisoning symptoms, please contact the National Pesticides Telecommunications Network (NPTN). Call toll-free 1-800-858-7378, between 8:00 am and 6:00 pm Central Time, Monday through Friday.