



R.E.D. FACTS

Chlorinated Isocyanurates

Pesticide Reregistration

All pesticides sold or used 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 undue hazards to human health or the environment.

When a pesticide is eligible for reregistration, EPA announces this and explains why in a Reregistration Eligibility Document, or RED. This fact sheet summarizes the information in the RED for the chlorinated isocyanurates, which include the following five antimicrobial compounds:

- dichloro-s-triazinetrione
- potassium dichloro-s-triazinetrione
- sodium dichloro-s-triazinetrione
- trichloro-s-triazinetrione
- sodium dichloro-s-triazinetrione dihydrate

Use Profile

The chlorinated isocyanurates are registered for use as disinfectants, sanitizers, algacides, fungicides, fungistats, bactericides, bacteriostats, microbicides and microbistats. These five compounds are used primarily as disinfectants and algicides in swimming pools and to a lesser extent in industrial cooling water systems. Minor uses include sanitizing and disinfecting food and non-food contact surfaces and sanitizing laundry.

Regulatory History

The chlorinated isocyanurates first were registered in the United States in 1958 for use as disinfectants, sanitizers, algicides and fungicides. In 1980, EPA issued a Data Call-In requiring additional toxicity data to assess the potential for kidney damage from exposure to these compounds. The Agency issued a Registration Standard for the chlorinated isocyanurates in May 1988 which evaluated the kidney toxicity data and required additional information to support the indoor and aquatic non-food uses. Currently, technical and end use products are registered containing chlorinated isocyanurates as active ingredients.

Human Health Assessment

Toxicity

The chlorinated isocyanurates have low acute oral and dermal toxicity but are very irritating to the eyes, and have been placed in Toxicity Category I (indicating the highest level of acute toxicity) for this effect. They are very mild skin irritants and are not considered to be skin sensitizers.

A subchronic toxicity study showed effects in the urinary bladders of male mice and rats. Chronic toxicity studies (2-year feeding studies) using rats and mice showed no oncogenic effects at any dose level. The chlorinated isocyanurates are not teratogenic or mutagenic. Metabolism studies show that they are rapidly absorbed, distributed and excreted unmetabolised.

Dietary Exposure

No exposure to the chlorinated isocyanurates is expected through the diet. Therefore, no tolerances (maximum residue limits) or exemptions from the requirement of a tolerance are established or required for these compounds. Their use as food and non-food contact surface sanitizers is regulated by the Food and Drug Administration (FDA), which has established food additive regulations as necessary (please see 21 CFR 178.1010). Their use in commercial egg washing is regulated by the U.S Department of Agriculture.

No international Codex Maximum Residue Levels are established for the chlorinated isocyanurates.

Occupational and Residential Exposure

Some occupational and residential exposure to the chlorinated isocyanurates can be expected based on their currently registered uses, primarily in swimming pools and to a lesser degree in industrial cooling water systems. However, because the compounds are of low toxicity (except for acute eye irritation), occupational and residential exposure monitoring data are not required. Current product labeling protects swimmers by prohibiting reentry into treated swimming pools/spas with greater than 3 parts per million (ppm) chlorine.

Human Risk Assessment

The chlorinated isocyanurates do not appear to cause acute (except eye irritation), subchronic or chronic toxicity. Dietary exposure to these compounds is not expected, and only limited residential and occupational exposure is anticipated. Current product labeling warns users that these compounds are very irritating to the eyes, and prohibits swimmers' reentry into treated pools if chlorine levels exceed 3 ppm. Therefore, the chlorinated isocyanurates' human health risks are adequately mitigated by product label precautions.

Environmental Assessment

Environmental Fate

All of the chlorinated isocyanurates form hypochlorous acid when dissolved in water. A weak acid and oxidizing agent, hypochlorous acid reacts readily with ammonia, amines, sulfides, sulfites, and nitrites present in the water. Antimicrobial activity results from the oxidation reactions with microbial enzyme systems. Isocyanuric acid and cyanuric acid remain and, under anaerobic conditions, degrade rapidly to carbon dioxide and ammonia. These products are highly soluble in water and would be rapidly excreted by aquatic organisms; therefore, no accumulation in mammals, fish or nontarget aquatic organisms is likely.

Ecological Effects

The chlorinated isocyanurates are practically nontoxic to birds. However, they are very highly toxic to coldwater fish, highly toxic to warmwater fish, highly toxic to freshwater invertebrates, and very highly toxic to estuarine and marine organisms.

Environmental Risk Assessment

Nontarget organisms may be exposed to the chlorinated isocyanurates through indirect discharges or effluents, or through accidental releases or spills. EPA does not conduct hazard assessments for these exposures, but is requiring relevant precautionary labeling for all chlorinated isocyanurate products used where an effluent may occur (please see Product Labeling Changes Required, below).

Additional Data Required

Additional generic product chemistry data are required for reregistration of certain technical or manufacturing use chlorinated isocyanurate products.

Product-specific data, including product chemistry, acute toxicology and in some cases efficacy studies, also are required for reregistration.

**Product Labeling
Changes Required**

The labels of all registered chlorinated isocyanurate products must comply with EPA's current pesticide labeling requirements. Any product label which allows both manufacturing and end use must be amended to specify only one use or the other.

Any chlorinated isocyanurate product used where an effluent may occur must bear the following Environmental Hazard label statement:

"This pesticide is toxic to fish and aquatic organisms. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or public waters unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product to sewer systems without previously notifying the sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA."

A summary of the label additions/changes required for chlorinated isocyanurate technical or manufacturing use products appears in the RED.

The following additions/changes are required in the labels and labeling of chlorinated isocyanurate end-use products:

- þ Include the reentry statement, "Reentry into treated swimming pools/spas is prohibited above levels of 3 ppm of chlorine."
- þ Products with commercial egg wash treatment on the label, as well as sanitizing solutions for food contact surfaces, must be in compliance with FDA requirements. The directions for use in sanitizing eggs must be similar to language prescribed in the RED.
- þ Label claims must be revised to reflect the nominal concentration of the active ingredient.

**Regulatory
Conclusion**

þ All registered pesticide products containing chlorinated isocyanurates as active ingredients are not likely to cause unreasonable adverse effects in people or the environment, and are eligible for reregistration. These products will be reregistered once any required generic data, product-specific data and revised labeling are received and accepted by EPA.

þ Registered products containing chlorinated isocyanurates as well as other active ingredients will be reregistered once the other active ingredients also are determined to be eligible for reregistration.

**For More
Information**

EPA is requesting public comments on the Reregistration Eligibility Document (RED) for the chlorinated isocyanurates 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 or to submit written comments, please contact the Public Response and Program Resources Branch, Field Operations Division (7506C), Office of Pesticide Programs (OPP), US EPA, Washington, DC 20460, telephone 703-305-5805.

In the future, the chlorinated isocyanurates RED 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 the chlorinated isocyanurates or about EPA's pesticide reregistration program, please contact the Special Review and Reregistration Division (7508W), OPP, US EPA, Washington, DC 20460, telephone 703-308-8000. For information about reregistration of individual chlorinated isocyanurate products, please contact the Registration Division (7505C), OPP, US EPA, Washington, DC 20460, telephone 703-305-7964.

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, 24 hours a day, seven days a week, or fax your inquiry to 806-743-3094.