

US EPA ARCHIVE DOCUMENT



R.E.D. FACTS

Disodium cyanodithioimido- carbonate (DCDIC)

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 3065, disodium cyanodithioimidocarbonate or DCDIC.

Use Profile

Disodium cyanodithioimidocarbonate or DCDIC is a microbicide/microbistat used in water treatment systems. Specifically, it is used as an industrial biocide and slimeicide to control slime-forming bacteria, algae and fungi in food processing water systems (cane and beet sugar mills), pulp and paper mill water systems, other commercial/industrial water cooling systems, and secondary oil recovery injection water. DCDIC is formulated as a soluble concentrate/liquid, and is applied through use of a measuring container, metering pump or drip-feed device.

Current use practice limitations prohibit discharge of effluent containing DCDIC into sewage systems without notifying the sewage plant authority, and into lakes, streams, ponds, estuaries, oceans or public waters except in accordance with an NPDES permit.

Regulatory History

DCDIC was registered in the U.S. as early as 1957 for use as an industrial bactericide and slimicide. EPA issued a reregistration Phase 4 Data Call-In (DCI) in September 1992, requiring product chemistry, toxicology, ecological effects and environmental fate data. Currently, 57 pesticide products are registered which contain the active ingredient DCDIC.

Human Health Assessment

Toxicity

DCDIC generally is of moderate acute toxicity but causes eye irritation and has been placed in Toxicity Category I (indicating the greatest degree of acute toxicity) for this effect. DCDIC is in Toxicity Category II for acute oral and primary dermal effects, and Toxicity Category III for acute dermal and inhalation effects. (Toxicity Category I indicates the greatest degree of acute toxicity and Category IV the least.)

In a subchronic toxicity study using rats, dermal irritation was observed at all doses but systemic effects were noted only at the highest dose levels. No gross internal organ effects were observed at any dose.

In two developmental toxicity studies using rabbits and rats, DCDIC caused both maternal and fetal effects at and above mid-dose. No definitive determination could be made as to whether the fetal effects observed were caused by DCDIC directly or occurred indirectly as a result of maternal toxicity.

DCDIC was not mutagenic in two out of three required studies. Although EPA does not believe that there is a genetic risk, the Agency is requiring that the third study be repeated as confirmatory information.

Dietary Exposure

Food additive tolerances (maximum limits for residues in processed foods) have been established by the Food and Drug Administration (FDA) for the sugar beet and sugar cane mill uses of DCDIC (please see 21 CFR 173.320). EPA defers to FDA regarding this dietary exposure to DCDIC. Additional food additive tolerances have been set for residues of DCDIC in food grade paper, paperboard (21 CFR 176.300) and adhesives (21 CFR 175.105). However, these uses are neither active nor supported for reregistration.

Occupational and Residential Exposure

Pesticide handlers--mixers, loaders and applicators--may be exposed to DCDIC when adding it to the metering pumps and measuring containers of food processing or industrial water systems.

EPA's exposure assessment, which considered combined dermal and inhalation exposure, indicates that the highest risk appears to result from the open pour application of this pesticide to cooling tower water. The margin of exposure (MOE) for this use pattern is only 38, significantly less than the 100-fold margin believed to be acceptable. However, due to the worst-case assumptions involved in the analysis, the actual risk to workers is expected to be at least 10% less, making the MOE 380 or more. Risks of developmental

toxicity to workers are expected to be low when appropriate protective equipment and clothing are used.

To mitigate acute as well as chronic toxicity hazards during open pouring of DCDIC, use of personal protective equipment (PPE) is required including protective eyewear, chemical resistant gloves, footwear, socks, a long-sleeved shirt, long pants and a respirator.

Post-application exposure is minimal posing negligible risk to workers. Residential exposure and risk to homeowners are not expected, based on the pesticide's use patterns.

Human Risk Assessment

Although DCDIC has two food uses (sugar beets and sugar cane), both are under FDA's purview. EPA defers to FDA regarding DCDIC's dietary risk.

The open pouring method of applying DCDIC to cooling tower water appears to pose the greatest risk of developmental toxicity to applicators. However, EPA's worst case exposure assessment probably results in an overestimate of risk; the actual risk to workers is expected to be low when appropriate protective equipment and clothing are used, as required by the RED document. Post-application exposure and risk are likely to be minimal. Residential exposure and risk to homeowners are not anticipated based on DCDIC's use patterns.

Environmental Assessment

Environmental Fate

The secondary oil recovery use of DCDIC normally would require extensive data regarding potential ground water impacts. However, properly encased injection wells preclude contact between materials placed down the well and any aquifer in the area; so EPA believes the chemical is not likely to present a hazard to ground water through this use. Other aquatic industrial uses carry National Pollutant Discharge Elimination System (NPDES) permit restrictions, limiting industrial discharges to acceptable levels for each site.

Ecological Effects

DCDIC is practically nontoxic to birds, no more than slightly toxic to freshwater and estuarine/marine fish, and moderately to highly toxic to aquatic/estuarine invertebrates.

Ecological Effects Risk Assessment

Because of its current use patterns, DCDIC is not likely to be found at levels of concern in the terrestrial environment, or to pose risks to birds.

EPA used a Tier Ic Estimated Environmental Concentration (EEC) model to assess residue levels occurring immediately downstream from industrial discharge sites. High exposure and typical exposure scenarios were developed for each use site. Typical exposure case EECs do not exceed levels of concern for any use sites; however, high exposure case EECs exceed levels

of concern for aquatic invertebrates at some industrial cooling towers and sugar mills. Thus, freshwater aquatic invertebrates may be at risk from effluent at high exposure sites. Similarly, estuarine and marine aquatic invertebrates may be at risk from effluent at high exposure industrial cooling tower and oil recovery sites.

While the use of DCDIC as a pesticide is regulated by EPA's Office of Pesticide Programs (OPP) under the federal pesticide law, FIFRA, the discharge of effluent containing DCDIC to surface waters is regulated under the NPDES permit program administered by EPA's Office of Water (OW) with the states. The NPDES process takes local conditions into account in issuing permits for the discharge of pollutants to bodies of water. EPA's OPP and OW will share information and cooperate in overseeing the use of biocides such as DCDIC.

Endangered Species

The high exposure case scenarios described above exceed the levels of concern for endangered fish at certain industrial sites, and those for endangered aquatic invertebrates at all sites. Effluent containing DCDIC should not be discharged into aquatic habitats where endangered species are known to live.

EPA is working with the U.S. Fish and Wildlife Service to develop a program to identify pesticides whose use may cause adverse impacts on threatened and endangered species, and to implement mitigation measures that will eliminate the adverse impacts. This program will require labeling that directs users to county-specific bulletins for information about use restrictions to protect endangered and threatened species in the county.

Additional Data Required

The generic data base for DCDIC is substantially complete. However, for confirmatory purposes, EPA is requiring an additional mutagenicity study and data indicating the products of hydrolysis. The Agency also is requiring product-specific data, including product chemistry and acute toxicity studies, as well as revised Confidential Statements of Formula and revised labeling for reregistration.

Product Labeling Changes Required

All end-use products containing DCDIC must comply with EPA's current pesticide product labeling requirements. In addition:

Effluent Discharge Statement - All end-use (and manufacturing use) products that may be contained in an effluent discharged to the waters of the U.S. must bear the following revised effluent discharge 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 EPA."

PPE Requirements - All end-use product labels must bear the following statement:

"For open pouring of this product, workers must wear eyewear, chemical-resistant gloves, footwear, socks, long-sleeved shirt, long pants and a respirator with either an organic-vapor-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C) or a canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G)."

Regulatory Conclusion

The use of currently registered products containing DCDIC in accordance with approved labeling will not pose unreasonable risks or adverse effects to humans or the environment. Therefore, all uses of pesticide products containing DCDIC are eligible for reregistration.

Although there is some concern about potential effects on aquatic organisms exposed to effluent from industrial use of DCDIC, discharge of such effluent generally will not cause unreasonable adverse effects on the environment. EPA's OPP and OW will share information to improve the regulation of DCDIC's use at specific sites across the country.

Products containing DCDIC will be reregistered once the required confirmatory generic data, product-specific data, revised Confidential Statements of Formula and revised labeling are received and accepted by EPA, and after the other active ingredients in these products also are determined to be eligible for reregistration.

For More Information

EPA is requesting public comments on the Reregistration Eligibility Decision (RED) document for DCDIC 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 DCDIC 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 DCDIC RED, or reregistration of individual products containing DCDIC, 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.