



# R.E.D. FACTS

## Sodium and Calcium Hypochlorite Salts

### **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 from pesticide producers and reviews a complete set of studies showing 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 sodium and calcium hypochlorite salts.

### **Use Profile**

Sodium and calcium hypochlorite are chlorinated inorganic disinfectants used in laundries, swimming pools, ponds, drinking water, and other water and wastewater systems; on food and non-food contact surfaces; and as a postharvest, seed or soil treatment on various fruit and vegetable crops. The hypochlorites control bacteria, fungi, and slime-forming algae that can cause diseases in people and animals.

### **Regulatory History**

Sodium and calcium hypochlorite, better known as bleach, are widely used compounds whose chemical and toxicological properties are extensively documented in published literature. These chemicals were first registered for use as pesticides in 1957.

EPA issued a Registration Standard for sodium and calcium hypochlorite in February 1986. The Agency concluded that no additional scientific data would be necessary to register or reregister products that contain sodium hypochlorite from 5.25% to 12.5%, or calcium hypochlorite from 65% to 70%, as long as the products contain no other active

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ingredients, contain no inert ingredients other than water, and bear Toxicity Category I labeling. EPA still supports these basic findings.

## **Human Health Assessment**

### **Toxicity**

All toxicology data requirements for sodium and calcium hypochlorite were satisfied when the Registration Standard was issued in 1986. No additional health effects data are required.

Sodium and calcium hypochlorite are extremely corrosive and can cause severe damage to the eyes and skin. They have been assigned to Toxicity Category I, indicating the highest degree of toxicity, for these acute effects.

No subchronic or chronic studies on sodium and calcium hypochlorite are needed, due to their simple chemical nature and structure. In the presence of oxygen, these compounds react easily with organic matter and convert readily into sodium chloride (table salt) and calcium chloride (road salt). Widely used in disinfecting water supplies for nearly a century, the hypochlorites have been proven safe and practical to use.

One concern with the use of sodium and calcium hypochlorite in treating water and waste water systems is that they may result in the formation of trihalomethanes in drinking water. Several trihalomethanes are considered potential carcinogens. However, EPA's Office of Drinking Water has addressed this potential risk by setting a Maximum Contaminant Level of 100 parts per billion (ppb) for trihalomethanes in drinking water. Using this standard, public water supply systems will be able to maintain levels of trihalomethanes within acceptable limits.

### **Dietary Exposure**

Residues of sodium and calcium hypochlorite may remain on certain food crops as a result of their disinfectant uses. However, these residues pose no known hazard to human health.

Preharvest and postharvest uses of calcium hypochlorite on all agricultural commodities are exempted from the requirement of a tolerance, or legal residue limit, because they pose no known hazard to the public health (please see 40 CFR 180.1054). Similarly, EPA will propose to exempt crop uses of sodium hypochlorite from tolerance requirements. (Sodium hypochlorite is among those few substances "generally recognized as safe," or GRAS. Please see 40 CFR 180.2.)

Food additive regulations are established for several food processing uses of the hypochlorites. Sodium hypochlorite may be used in washing and lye peeling of fruits and vegetables (please see 21 CFR 173.315). Sodium or calcium hypochlorite may be used as a final sanitizing rinse on food processing equipment (see 21 CFR 178.1010).

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The 1986 Registration Standard required that food additive tolerances be obtained for calcium hypochlorite in sugar syrup and raw sugar; however, these additional tolerances were not obtained. Registrants now must delete these uses from the appropriate calcium as well as sodium hypochlorite labeling within eight months or face enforcement action.

### **Other Routes of Exposure**

The use of protective clothing, including safety glasses or goggles and chemical-resistant gloves, is still required while handling and applying products that contain sodium or calcium hypochlorite as the active ingredient, due to the acute toxicity of these products.

In addition, reentry levels must be met before entering swimming pools or hot tubs/spas treated with sodium or calcium hypochlorite, and reentry intervals must be observed before using sprayed or fogged food and non-food contact surfaces.

### **Human Risk Assessment**

Based on the toxicity profile and exposure scenarios for calcium and sodium hypochlorite, EPA concludes that the risks from chronic and subchronic exposure to low levels of these pesticides are minimal and without consequence to human health. Acute exposure to high concentrations can cause eye and skin injury. However, these risks are mitigated by precautionary labeling that requires protection of eyes and skin while using these pesticides.

### **Environmental Assessment**

All environmental fate and ecological effects data requirements for sodium and calcium hypochlorite have been satisfied since the Registration Standard was issued in 1986. Upon reevaluating these data, EPA has concluded that the currently registered uses of the hypochlorites will not result in unreasonable adverse effects to the environment.

### **Environmental Fate**

The environmental fate data requirements for the hypochlorite salts are primarily satisfied by the document, Ambient Water Quality Criteria for Chlorine, by J. Tobler, et. al., U.S. EPA, June 1981.

In fresh water, the hypochlorites break down rapidly into non-toxic compounds when exposed to sunlight. In seawater, chlorine levels decline rapidly; however, hypobromite (which is acutely toxic to aquatic organisms) is formed. EPA believes that the risk of acute exposure to aquatic organisms is sufficiently mitigated by precautionary labeling and National Pollutant Discharge Elimination System (NPDES) permit requirements.

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## Ecological Effects

Sodium and calcium hypochlorite are low in toxicity to avian wildlife, but they are highly toxic to freshwater fish and invertebrates. However, uses that result in point source discharges of hypochlorite-containing effluents are regulated through issuance of site-specific NPDES permits. This program ensures that the amount of hypochlorites discharged at each site will not pose significant adverse effects on non-target organisms.

## Additional Data Required

The generic data base for sodium and calcium hypochlorite has been reviewed and found to be complete for reregistration.

EPA has adequate product-specific data for products that meet the criteria of the 1986 Registration Standard, and is requiring no further data for their reregistration.

Product-specific data are required only for pesticide products containing sodium or calcium hypochlorite that do not meet the criteria of the 1986 Registration Standard, that is,

- products with a percent of active or inert ingredients that fall outside the ranges specified by the Standard;
- products with inert ingredients other than water; and
- products containing additional active ingredients (mixtures).

## Product Labeling Changes Required

The labels of end-use products containing sodium or calcium hypochlorite must be amended as follows:

È Any product label that currently allows both end use and manufacturing use must be amended to specify only one use or the other.

È Because they have the potential to cause serious eye and skin damage if accidentally spilled, all products assigned to Toxicity Category I due to eye and/or skin effects must bear the Statement of Practical Treatment on the front panel. They also must continue to require use of protective clothing during application.

È The "If Swallowed" statement must say: "IF SWALLOWED, drink large amounts of water. DO NOT induce vomiting. Call a physician or poison control center immediately."

È Since food additive tolerances were not established as previously required, the sugar syrup and raw sugar uses of sodium and calcium hypochlorite must be deleted from product labeling within eight months or EPA will initiate appropriate enforcement action.

È To protect aquatic life, products with uses that result in discharge into the aquatic environment must include a statement on the label indicating that the product is toxic to fish and aquatic organisms. They also must bear a statement prohibiting discharge of effluent

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containing the product into bodies of water, without an National Pollutant Discharge Elimination System (NPDES) permit.

**Regulatory  
Conclusion**

È All pesticide products containing sodium and calcium hypochlorite are eligible for reregistration, except calcium hypochlorite products used on sugar syrup and raw sugar. Since the required food additive tolerances were not obtained, these uses now must be deleted from product labeling.

È Products that meet the criteria of the 1986 Registration Standard will be reregistered when revised labeling and confidential statements of formula are received and accepted by EPA.

È Products that do not meet the criteria of the 1986 Registration Standard will be reregistered only when product-specific data, revised labeling and confidential statements of formula are received and accepted by EPA.

**For More  
Information**

EPA is requesting public comments on the Reregistration Eligibility Document for sodium and calcium hypochlorite salts 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), U.S. EPA, Washington, D.C. 20460, telephone 703-557-2805. Please note that in the future, the RED will be available from NTIS, at the address and telephone number below.

To obtain a copy of the February 1986 Registration Standard for sodium and calcium hypochlorite salts, please contact the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA. 22161, telephone 703-487-4650. Request document #PB87-103222.

For more information about sodium and calcium hypochlorite, or about EPA's pesticide reregistration program, please contact the Special Review and Reregistration Division (7508W), OPP, U.S. EPA, Washington, D.C. 20460, telephone 703-308-8000. For information about reregistration of individual hypochlorite products, please contact the Registration Division (7505C), OPP, U.S. EPA, Washington, D.C. 20460, telephone 703-557-5447.

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.