United States Environmental Protection Agency
Pesticides And Toxic Substances (H-7508W)
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EPA R.E.D. FACTS

Carbon

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, 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 about carbon presented in the RED for carbon and carbon dioxide.

Use Profile

Carbon is formulated with several other pesticide active ingredients (sodium and potassium nitrates and sulfur), and used as a rodenticide, predacide and insecticide in six pyrotechnic fumigant gas cartridge products. When the cartridges are ignited and placed in pest burrows, they produce carbon monoxide and other gases which asphyxiate target pests, including pocket gophers, moles, ground squirrels, prairie dogs, rats, skunks, woodchucks, red foxes, coyotes, and ground wasps.

Carbon is naturally-occurring and ubiquitous in the environment. In addition to the pesticide uses described here, it has many other non-pesticidal uses.

Carbon is a nonmetallic element found in all organic and many inorganic compounds. Pure carbon exists in three forms: as a black powder, as graphite, and as diamond crystals. Carbon is the principal component in charcoal and coal.

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Regulatory History

The first pyrotechnic cartridge pesticide product containing the active ingredient carbon was registered in 1948. Several reported injuries, including one fatality attributed to gross misuse, prompted EPA to propose cancellation of these products in 1982. However, the registrants kept these products on the market by submitting upgraded labeling and data on the burning characteristics of cartridges. Since then, four more injuries have been reported to EPA, all involving misfiring of ignited cartridges. Through the Data Call-In Notice issued in conjunction with this RED, the Agency is imposing several data requirements to obtain more information on quality control and product safety.

Human Health Assessment

Toxicity

The toxicology studies on carbon available in the open literature are adequate to assess the risk to humans; all of EPA's usual toxicology data requirements have been waived. Carbon is a natural component of all organic chemicals and all living organisms. One form of carbon, activated charcoal, is given orally as an adsorbent for treatment of accidental drug poisoning.

The real, functional, pesticidally active ingredients of the pyrotechnic fumigants are the pyrolysis products of the carbon and other components. The toxic properties of carbon bear no relationship to the toxicity of these pyrolysis products.

Applicator Exposure

Based upon reported incidents, the primary human hazard posed by use of the pyrotechnic fumigant products is dermal burns to applicators, which occur when flares ignite prematurely. Applicators also may be exposed to the gaseous fumes from these products if they do not cover burrows properly after inserting lit cartridges, or remain too close to covered burrows. However, if used properly, these products should pose very low inhalation and dermal exposure hazards to people.

Human Risk Assessment

The toxicity data usually required for pesticide registration are not required for this use of carbon. A basic component of all living organisms and all organic chemicals, carbon is truly ubiquitous. Human exposure to carbon through use of the pyrotechnic fumigants is expected to be negligible.

Environmental Assessment

EPA is not requiring any environmental fate or ecological effects data on carbon. All the usual data requirements have been waived.

Environmental Fate

The physical and chemical properties of carbon, a naturally occurring substance, are well understood. Burning carbon with sodium and potassium nitrates results in simple organic and inorganic compounds, mostly in the form of gases, which diffuse through burrow openings or into the soil. Exposure of the environment is limited and localized, however, so environmental fate studies are not required.

Ecological Effects

Since the gas cartridges are applied below the surface of the ground, avian and aquatic species are not exposed. However, any organism in a properly treated burrow is likely to be killed. Endangered species that inhabit burrows are at potential risk. As a result of several earlier consultations with the Fish and Wildlife Service, EPA already requires endangered species labeling to protect the six species identified as being at risk. Another ongoing consultation may bring about the need for further label revisions in 1992.

Additional Data Required

The generic data base supporting reregistration of carbon is determined to be complete for reregistration. However, submission of product-specific acute toxicity, efficacy and product chemistry data are being required by the Data Call-In Notice issued in conjunction with this RED.

Product Labeling Changes Required

The labels of end-use products containing carbon must comply with EPA's current pesticide labeling requirements. In addition, the Agency soon will issue detailed guidance on labeling for gas cartridge products, which will address concerns regarding applicator safety and protection of non-target and endangered organisms.

Regulatory Conclusion

- All registered pesticide products containing carbon can be used without causing unreasonable adverse effects in people or the environment. Therefore, they are eligible for reregistration.
- The six end-use pyrotechnic fumigant products containing carbon will be reregistered once product-specific data and revised labeling are received and accepted by EPA, and

once any data and labeling needed for the other two active ingredients in these products (potassium and sodium nitrate and sulfur) also are received and accepted.

For More Information

EPA is requesting public comments on the Reregistration Eligibility Document for carbon and carbon dioxide 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 (H-7506C), Office of Pesticide Programs (OPP), US EPA, Washington, DC 20460, telephone 703-557-2805.

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