Product Safety Summary

Calcium Peroxide

CAS No. 1350-79-9

This Product Safety Summary is intended to provide a general overview of the chemical substance. The information on the summary is basic information and is not intended to provide emergency response information, medical information or treatment information. The summary should not be used to provide in-depth safety and health information. In-depth safety and health information can be found on the Safety Data Sheet (SDS) for the chemical substance.

Names

- Calcium peroxide
- Calcium dioxide
- Calcium superoxide

Product Overview

Solvay Chemicals, Inc. does not sell calcium peroxide directly to consumers. Most calcium peroxide is used as a dough conditioning aid or for soil remediation (decontamination). When used in doughs, calcium peroxide is decomposed during baking. Some calcium peroxide is used in toothpastes as a whitener. Calcium peroxide can be used in agriculture to release oxygen into soils or as a seed pretreatment. It also stimulates the aerobic microbial degradation of hydrocarbons in contaminated groundwater and soil. Consumers would be exposed to only very small amounts of calcium peroxide in consumer product applications such as toothpastes.

Calcium peroxide is a solid chemical used as a source of oxygen or hydrogen peroxide. When placed in water, calcium peroxide begins to decompose and release oxygen. When treated or dissolved in acids, calcium peroxide forms hydrogen peroxide. Calcium peroxide is a pale yellow, granular or powdered solid oxidizer.

Exposure to calcium peroxide can cause irritation to the skin, eyes, and respiratory tract. Ingestion should be avoided at all concentrations.

Calcium peroxide is not persistent in the environment and slowly decomposes to form calcium hydroxide and oxygen.

Manufacture of Product

- Calcium Peroxide is made by addition of hydrogen peroxide to slaked lime (calcium hydroxide), then drying to form a powder.

$$Ca(OH)_2 + H_2O_2 \rightarrow CaO_2 + 2H_2O$$

- Calcium peroxide naturally decomposes very slowly to form calcium hydroxide and oxygen. Depending upon the environment, the decomposition proceeds according to the reactions below:

$$2CaO_2 + 2H_2O \rightarrow 2Ca(OH)_2 + O_2$$

or

$$CaO_2 + 2H_2O \rightarrow Ca(OH)_2 + H_2O_2$$
$$2H_2O_2 \rightarrow 2H_2O + O_2$$

- Solvay Chemicals, Inc. imports calcium peroxide which is manufactured by affiliated Solvay companies outside of North America.

Product Description

Calcium peroxide (CaO_2) is manufactured and sold as a pale yellow, odorless powder or granules. Typical physical properties are provided in Table 1.

Table 1: Typical physical properties for Calcium peroxide

Decomposition Temperature	> 527ºF (275ºC)
Bulk Density	28 – 34 lbs./ft^3 (450-550 kg/m^3)
Flash Point	Non- flammable
Solubility in Water	1.65 g/L @ 68ºF (20ºC)
pH	11.7 (1% aqueous suspension)

Product Uses

The majority of calcium peroxide exported to the United States is used as a dough conditioner by the baking industry or for bioremediation (decontamination) of groundwater or soil. A small amount is used in toothpaste as a whitener or for oxygenation of water bodies.

Exposure Potential

- **Workplace Exposure** - Exposures can occur at a calcium peroxide manufacturing facility or a manufacturing, packaging or storage facility that handles the product. Exposure may also occur in the event of a transportation incident. Persons involved in maintenance, sampling and testing activities, or in the loading and unloading of calcium peroxide containers are at greater risk of exposure. Following good industrial hygiene practices will minimize the likelihood of exposure; however, persons involved in higher risk activities should always wear proper personal protective equipment such as protective gloves, goggles and a hard hat. In instances where the potential for dusting is high, proper respiratory protection should also be worn.

- **Consumer Exposure to Products Containing Calcium Peroxide** - Although Solvay Chemicals, Inc. does not sell calcium peroxide directly to consumers, a few of its uses are in consumer products. When used as a dough conditioner in baking, the calcium peroxide is decomposed to calcium hydroxide in the finished product (bread). In toothpastes, the calcium peroxide decomposes during use in the presence of water form a small amount of hydrogen peroxide which then whitens the teeth. In both of these applications, the amount of calcium peroxide a consumer may encounter is too small to cause any adverse effects. The user should always use any calcium peroxide containing products in strict compliance with the manufacturer's use and/or label instructions.

- **Environmental Releases** - Spills of calcium peroxide should be contained and isolated from waterways, sewer drains, and any flammable or combustible materials. Small spills should be swept up, and placed in a compatible container. Never replace any spilled or contaminated calcium peroxide back in the original container. Any remaining residues should be diluted with large amounts of water. Dispose of waste, rinsate or residues in accordance with applicable local, state or federal regulations. Do not use adsorbents to soak up calcium peroxide washings. Absorbents and adsorbents may contain organics that can react with calcium peroxide. Rinse calcium peroxide contaminated combustibles such as cloth or paper towels with water until they are free of residual calcium peroxide. Persons attempting to clean up calcium peroxide spills should wear proper personal protective equipment (see guidelines in Workplace Exposure section of this document or Safety Data Sheet).

- **Fires** - Fires involving calcium peroxide should be extinguished with large amounts of water. Containers of calcium peroxide involved in a fire should be cooled with water sprays taking care not to contaminate the contents inside with water. Wet or damp calcium peroxide may start to decompose and release heat causing any nearby combustibles to catch fire. If the container begins to discolor or vent violently, emergency responders should evacuate the area.

For additional information concerning calcium peroxide emergency response procedures, please consult the Safety Data Sheet.

Health Information

Calcium peroxide is found in small concentrations in some consumer products. Exposure to larger quantities may cause symptoms related to skin or inhalation irritation. Calcium peroxide can produce the following adverse health affects:

- **Contact** - Skin exposure can cause symptoms ranging from minor skin irritation or itching to redness and swelling. Eye exposure to calcium peroxide may result in severe eye irritation, and burns.
- **Inhalation** - The inhalation of calcium peroxide dusts can cause nose and throat irritation or coughing. Repeated or prolonged exposures may cause shortness of breath, tightness of chest or nosebleeds.
- **Ingestion** - The ingestion of calcium peroxide may cause bloating, belching, irritation of the mouth and throat, nausea, vomiting, abdominal pain and diarrhea.
- **Other Effects** - The International Agency for Research on Cancer (IARC) has not classified calcium peroxide as a carcinogen (cancer causing).

For more information on health effects and routes of exposure, or for information concerning proper first aid measures, please consult the Safety Data Sheet.

Environmental Information

Calcium peroxide does not naturally occur in the environment.

Calcium peroxide is not known to bioaccumulate or to persist in the environment for a prolonged time. The degradation products of calcium peroxide are calcium hydroxide and oxygen. For more ecological and environmental information concerning this product, please consult the Safety Data Sheet.

Physical Hazard Information

Calcium peroxide is an oxidizer and will support combustion. Calcium peroxide can cause fires when left in contact with combustible materials such as paper, wood or cloth, especially if wet or damp.

Exposure of calcium peroxide to impurities such as strong acids, bases, and transition metals (copper, manganese, chromium, etc.) and their salts can cause calcium peroxide decomposition. Calcium peroxide decomposition will result in the liberation of oxygen. Systems used to store or transport calcium peroxide must be properly vented and must have enough emergency venting capacity to allow the contents of the system to withstand a catastrophic decomposition event.

For more information concerning the physical hazards of this product, please consult the Safety Data Sheet. For information concerning the proper design of calcium peroxide systems, please contact Solvay Chemicals, Inc.

Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use and/or disposal of this chemical. These regulations can vary by city, state, country or geographic region. Information may be found by consulting the relevant Safety Data Sheet specific to your country or region.

Additional Information

- Solvay America, Inc. www.solvaynorthamerica.com
- Solvay Chemicals, Inc. www.solvaychemicals.us
- Solvay Chemicals, Inc. Safety Data Sheets
  www.solvaychemicals.us/EN/Literature/LiteratureDocuments.aspx
- Contact Solvay Chemicals, Inc. solvaychemicals.us@solvay.com
- NJ Department of Health & Senior Services Hazardous Substance Fact Sheets
  http://web.doh.state.nj.us/rtkhsfs/factsheets.aspx
- This summary was prepared in March, 2011
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