

Oregon Department of Human Services

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TECHNICAL BULLETIN

HEALTH EFFECTS INFORMATION

Prepared by:
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CALCIUM CARBONATE
"lime, limewater"

For more information contact:
Oregon Health Division
Environmental Toxicology Section
(503) 731-4015

Drinking Water Section
(503)731-4010

SYNONYMS:

Lime, ground limestone, dolomite, sugar lime, oyster shell, coral shell, marble dust, calcite, whiting, marl dust, putty dust

CHEMICAL AND PHYSICAL PROPERTIES:

- Molecular Formula: CaCO_3
- White solid, crystals or powder, may draw moisture from the air and become damp on exposure
- Odorless, chalky, flat, sweetish flavor
(Do not confuse with "anhydrous lime" which is a special form of calcium hydroxide, an extremely caustic, dangerous product. Direct contact with it is immediately injurious to skin, eyes, intestinal tract and respiratory system.)

WHERE DOES CALCIUM CARBONATE COME FROM?

Calcium carbonate can be mined from the earth in solid form or it may be extracted from seawater or other brines by industrial processes. Natural shells, bones and chalk are composed predominantly of calcium carbonate.

WHAT ARE THE PRINCIPLE USES OF CALCIUM CARBONATE?

Calcium carbonate is an important ingredient of many household products. It is used as a whitening agent in paints, soaps, art products, paper, polishes, putty products and cement. It is used as a filler and whitener in many cosmetic products including mouth washes, creams, pastes, powders and lotions. It is widely present naturally and as an additive in food and beverage production for dietary calcium, for adjustment of pH and as a stabilizer. It is also widely used as a calcium source in animal feeds. It is used in fertilizers and soil conditioners and in many industrial processes. It is also widely used in medications, as an antacid as a bulking agent and whitener. Calcium carbonate is also used in water treatment to reduce acidity and to increase alkalinity of naturally acid waters.

IS CALCIUM CARBONATE NATURALLY PRESENT IN DRINKING

WATER?

Yes, because calcium and carbonates are common natural substances, they are present in many natural soils, in groundwater, in plants and in animal tissues. Water supplies in limestone areas and in desert climates usually have high levels of calcium carbonate. Water supplies from acidic formations contain very little calcium or carbonate.

IS CALCIUM CARBONATE HAZARDOUS TO HEALTH?

Only in concentrated solid form or in very concentrated solutions is calcium carbonate potentially harmful. Direct eye or skin contact with pure crystals or powder can produce irritation. Inhalation of crystals or powder can be irritating to the respiratory tract. Prolonged contact with concentrated solutions of calcium carbonate has a drying effect on skin. Dilute solutions of calcium carbonate are generally harmless, and may be beneficial.

DO NOT CONFUSE CALCIUM CARBONATE WITH ANHYDROUS OR UNSLAKED LIME WHICH IS A SPECIAL FORM OF CALCIUM HYDROXIDE (RATHER THAN CALCIUM CARBONATE) AND MUST BE HANDLED WITH EXTREME CARE.

WHAT ARE TYPICAL LEVELS OF CALCIUM AND CARBONATE IN FOOD PRODUCTS?

Calcium levels in foods vary enormously. High calcium foods such as milk and other dairy products contain calcium levels of 320 to 8000 parts per million. Soy products and dark, leafy vegetables have calcium levels similar to milk products. Persons taking therapeutic doses of antacid, and persons taking calcium dietary supplements often take a gram (1000 mg) or more of calcium per day in addition to the foods they eat.

Carbonate levels in food and beverages are also highly variable. Carbonated soft drinks contain 2700 to over 10,000 ppm. Commercial bottled waters contain 11 to 3000 ppm carbonate. Water exposed to air for prolonged periods will develop carbonate levels up to 250 ppm by dissolving carbon dioxide from the air.

HOW MUCH CALCIUM CARBONATE IS ADDED TO WATER FOR CORROSION CONTROL?

Generally calcium carbonate for corrosion control is added to water at rates between 1 and 40 ppm. These additions are very small compared to the amounts of sodium and carbonate already present in many waters, and compared to the amounts present in beverages and foods.

ARE THERE LEGAL LIMITS FOR THE AMOUNT OF CALCIUM OR CARBONATE IN DRINKING WATER?

No, because calcium and carbonate are naturally present in water, are usually beneficial and pose no hazard at the low levels normally found, there are no regulatory limits. The US Food and Drug Administration considers this salt to be generally recognized as safe for addition to foods and beverages for nutrient enhancement, for bulking, for coloration, for alteration of acidity and for stabilization purposes. The Oregon Health Division recommends that carbonate (measured as calcium carbonate or "hardness") in drinking water not exceed a level of 240 ppm.

WHERE CAN I GET ADDITIONAL INFORMATION?

Specific questions about the treatment and quality of your drinking water should be addressed to your water provider. You also can obtain further information from the Health Division by calling the above telephone numbers.