



CHLORINE DIOXIDE AND CHLORITE

What are CHLORINE DIOXIDE AND CHLORITE?

Chlorine dioxide is a man-made gas that is yellow to reddish-yellow in color, with an unpleasant odor similar to chlorine. When chlorine dioxide is added to water, it forms chlorite.

Where can chlorine dioxide and chlorite be found and how are they used?

Paper plants use chlorine dioxide to bleach paper. Public drinking water suppliers use low levels of chlorine dioxide to kill harmful bacteria and organisms.

How can people be exposed to chlorine dioxide and chlorite?

You could be exposed to chlorine dioxide and chlorite through:

Drinking water purified with chlorine dioxide and chlorite.

Touching chlorine dioxide and chlorite by being in the air they have contaminated. Both chemicals are gases that break down in air.

Eye Contact by being in the air that chlorine dioxide and chlorite have contaminated. Employees of pulp and paper mills or water treatment plants can have a high exposure if they work where chlorine dioxide and chlorite are used as disinfectants.

How do chlorine dioxide and chlorite work?

Both chlorine dioxide and chlorite break down quickly when they enter the body. Chlorine dioxide changes to chlorite ions, small groups of atoms with an electric charge. These ions further break down into chloride ions that leave the body within hours or days through the urine.

How can chlorine dioxide and chlorite affect my health?

Breathing air containing chlorine dioxide gas can irritate your nose, throat and lungs. There is no evidence that chlorine dioxide or chlorite affects reproduction in humans. Most people will not be exposed to enough chlorine dioxide or chlorite to suffer significant and long-lasting damage. Exposure to very high levels can cause breathing problems. No studies have been done on cancer caused by exposure to chlorine dioxide or chlorite.

How is chlorine dioxide and chlorite poisoning treated?

There is no treatment for chlorine dioxide or chlorite poisoning. Sometimes providers use a medicine to open the airways in the lungs. They may suggest other treatments depending on the amount and length of exposure.

What should I do if exposed to chlorine dioxide and chlorite?

If chlorine dioxide or chlorite gets on your skin, take off your clothes quickly. Wash your skin with lots of soap and water.

If you eat or drink something with chlorine dioxide or chlorite in it, get medical help right away.

If you breathe chlorine dioxide or chlorite, go to an area with fresh air. Get medical help right away. If needed, rescue breathing or cardio-pulmonary resuscitation (CPR) should be given.

24/7 Emergency Contact Number: 1-888-295-5156

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What factors limit use or exposure to chlorine dioxide and chlorite?

Workplaces using these chemicals should maintain safe practices to limit exposure. Chlorine cylinders should be stored in covered spaces with a source of fresh air. They should be kept away from chlorinators, heat and items that catch fire easily. Cylinders should always be stored standing up with the valve on top. Workers should be trained in the right way to handle the cylinders. Special wrenches should be used to engage the cylinder valves.

Workers who use chlorinators should work in a separate room with fresh air, with the door closed. Consider wearing respirators, and definitely wear protective clothing. Self-contained breathing units should be placed outside the room for emergency use. It is recommended that a non-opening window be in the wall next to the door, so the room can be viewed without entering it. Employees should wash very well after using chlorinators, and then again at the end of the work shift.

Chlorine dioxide is a chemical compound with the formula ClO_2 and the chlorite ion, or chlorine dioxide anion, is ClO_2^- .

Is there a medical test to show whether I've been exposed to chlorine dioxide and chlorite?

There is a test to show chlorite in tissues, blood, urine and waste matter. However, this test cannot determine how much chlorite exposure occurred, or if there will be harmful effects.

Technical information for chlorine dioxide and chlorite (chlorine dioxide anion)

CAS Number: 91-20-3

Chemical Formula: chlorine dioxide – ClO_2 chlorite – ClO_2^-

Carcinogenicity (EPA): Chlorine dioxide and chlorite are not classifiable as to human carcinogenicity because of inadequate data in humans and animals.

MCL (Drinking Water): 0.8 milligrams per liter for chlorine dioxide
1.0 milligrams per liter for chlorite

OSHA Standards: 0.1 parts per million (ppm) of air for chlorine dioxide or chlorite (0.3 mg/m^3)

NIOSH Standards: 0.1 parts per million of air for chlorine dioxide

ACGIH: 8 hr. Time Weighted Average (TWA): 0.1 ppm

References and Sources

Agency for Toxic Substances and Disease Registry (ATSDR). 2004. *Toxicological profile for Chlorine Dioxide and Chlorite - draft for public comment*. Atlanta, GA: U.S. Department of Health and Human Services.

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