

Understanding Gases

Chlorine Dioxide



Chlorine dioxide is an orange to yellow coloured gas, with a strong chlorine smell.

It is known for its disinfectant and antibacterial characteristics, specifically its capacity to cleanse drinking water and destroy bacteria.



Chlorine dioxide is used across a plethora of applications, including the medical, healthcare, chemical, industrial, but always as a killer of biological agents.



When mixed with water chlorine dioxide forms a reactive ion called chlorite ion. Limits are generally placed on the concentration of chlorite ions in water, which limits the use of chlorine dioxide, however it is a very effective killer of many biological agents – better than chlorine for example.



It is also an oxidiser which in high concentrations can spark fires, or intensify existing ones, as well as cause explosions if confined and heated under pressure.

What are the dangers of chlorine dioxide?

As it is a disinfectant, chlorine dioxide is harmful in large volumes. It is used in very small amounts to kill a range of bacteria and viruses in water facilities, however when consumed in any concentration above 1ppm it can cause substantial damage to human health.

Consumption can cause harm to the body's red blood cells and affect the lining of the stomach. It irritates the eyes and skin, and can cause severe burns to the tissue it comes into direct contact with. The ENT system is also affected, and the airways can be harmed with excessive exposure, leading to chest and lung based conditions such as bronchitis, wheezing, and pulmonary edema. As it is toxic, chlorine dioxide also creates extensive coughing, headaches, and pain.

How do you detect chlorine dioxide?

Chlorine dioxide is recognisable by its intense odour, which is akin to the smell of bleach or chlorine in some cases. However, this smell alone is not sufficient enough to rely on for detection procedures, particularly since very low concentrations are still dangerous. As a result, a reliable and efficient chlorine dioxide gas detector is required to keep individuals aware of the chlorine dioxide levels in their working environment.

Although it is pungent in smell and recognisable in colour, only a chlorine dioxide gas detector can precisely monitor the concentration of chlorine dioxide gas. It can be detected in air or in water, when dissolved, in units of parts per million (ppm).

Although it is pungent in smell and recognisable in colour, only a chlorine dioxide gas detector can precisely monitor the concentration of chlorine dioxide gas. It can be detected in air or in water, when dissolved, in units of parts per million (ppm).

What should you do if you are exposed?

For skin that has been exposed to chlorine dioxide, immediate sanitation procedures should begin, to cleanse the skin with water and/or mild soap. All affected clothing should also be removed immediately.

In the case of an individual breathing in chlorine dioxide gas, it is important for them to be moved to an area with fresh air at once. If their breathing has been affected greatly, or has stopped completely, artificial respiration should be performed and medical attention administered. When swallowed, chlorine dioxide can cause real harm, so the individual should be given large quantities of water to cleanse the system. To note, induced vomiting should not be undertaken.



Orange to yellow coloured gas, with a strong chlorine smell.



Harmful in large volumes, causing the most harm to the skin, nervous system, eyes, and respiratory system.



For skin that has been exposed to chlorine dioxide, immediate sanitation procedures should begin, to cleanse the skin with water and/or mild soap.