



CHLORINE DIOXIDE: What You Can't Tell From the Name

While chlorine dioxide has chlorine in its name, its chemistry is radically different from that of chlorine. It has to do with the way electrons interact with one another. As we all learned in high school chemistry, we can mix two compounds and create a third that bears little resemblance to its parents. For instance, by mixing two parts of hydrogen gas with one of oxygen - liquid water is formed. We should not be misled by the fact that chlorine and chlorine dioxide share a word in common. The chemistries of the two compounds are completely different

Chlorine dioxide and chlorine – because of their fundamentally different chemistries – react in distinct ways with organic compounds, and as a result generate very different by-products. It's this difference that explains the superior environmental performance of chlorine dioxide in a number of industrial applications.

Chlorine and chlorine dioxide are oxidising agents – electron receivers. Chlorine has the capacity to take in two electrons, whereas chlorine dioxide can absorb five. This property, along with the complex but well-known ways chlorine combines with certain organic materials, to form chlorinated organics that cause numerous environmental problems, explains the superiority of chlorine dioxide based products.

Aromatic compounds have atoms arranged in rings and they may have other atoms, such as chlorine, attached to these rings, to form a chlorinated aromatic. Within the group of chlorinated aromatics, which can be toxic to some organisms, are the infamous dioxins.

Chlorine dioxide's behaviour as an oxidising agent is quite dissimilar. Instead of combining with the aromatic rings, chlorine dioxide breaks these rings apart. In addition, as the use of chlorine dioxide increases, the generation of chlorinated organics falls dramatically. Chlorine dioxide's chemistry also explains why it is such an effective oxidant, or bleaching agent. It's 2.5 times more powerful than chlorine gas, and also much more selective.

In water treatment applications, chlorine dioxide, because of its more powerful action, has broad spectrum activity over a wide range of micro-organisms, and has the ability to penetrate biofilms, and other heavily contaminated areas, where chlorine treatment is simply not effective. Because of its increased efficiency, far less of the chlorine dioxide product need be used, eliminating waste, and reducing handling costs and risk

Chlorine dioxide has been shown to be, more powerful, easier to use, and more environmentally friendly than equivalent chlorine treatments