



Halo acetic acids

Halo acetic acids are a group of disinfection byproducts formed in water by a reaction between organic matter, which is naturally present, and oxidation products formed mainly during disinfection of water with chlorine or bromine.

Formation of halo acetic acids

Halo acetic acids are chemical byproducts formed organic material during the disinfection of water with chlorine, chloramine, chlorine dioxide, and ozone. Chlorine has been used for nearly two hundred years for controlling pathogens in drinking, swimming, and wastewater, and for cleaning and disinfecting household surfaces and the “bleaching” of textiles.

Which halo acetic acids are formed, depends not only on the organic material, but also on the inorganic material in the drinking water. With chlorine and bromine, a total of nine different halo acetic acids can be formed.

Environmental use in the Netherlands

Halo acetic acids form an important group of chlorinated disinfection byproducts. Acetic acids consist of one carbon atom to which three hydrogen atoms are attached, which are attached to a carboxyl group. In halo acetic acids, the hydrogen atoms are partially replaced with halogen atoms. Halo acetic acids are

nonvolatile compounds and dissolve well in water. The concentration in water is determined by the pH of the water: at a low pH, more halo acetic acids are formed.

Halo acetic acids are found in various environments, such as river water, rain water, sewage, sea water, and even in conifer needles.

Harmful to society

Halo acetic acids are proven to be mutagenic, cytotoxic, genotoxic, and teratogenic. In addition, recent research has shown that halo acetic acids can affect the activity of pyruvate dehydrogenase and can affect the cellular metabolism.

Dichloroacetic acid and trichloroacetic acid have been proven to be carcinogenic to animals. Dichloroacetic acid in particular is believed to be a strong carcinogen. In addition, chloroacetic acids cause plant growth to decline; trichloroacetic acid is even used as an herbicide.

Legislation

The health effects of halo acetic acids are not fully known. They are suspected of increasing the risk of cancer in humans. Because of these health effects, the US EPA (United States Environmental Protection Agency) prescribes a standard of 60 µg/L for the sum of five of the halo acetic acids in drinking water, namely; MCAA, DCAA, TCAA, MBAA, and DBAA (US EPA, 2002). In the Dutch Water Decree, there are no standards for the content of halo acetic acids in drinking water (Waterleidingbesluit, 2001). The World Health Organization (WHO) Guidelines for Drinking-water Quality also do not give standards for halo acetic acids (WHO, 2004).

An earlier study by Parvez S. et al., found HAZ levels above the legal limit in thirty-five percent of water samples. In the Eurofins laboratory, values above the reporting limit were found in more than 20% of the samples.

Eurofins' offerings

Reporting limit: 9 mg/l in drinking water, and 10 mg/l for other surface water, groundwater, wastewater, seawater matrices.

Bromochloroacetic acid (BCAA)	5589-96-8
BromineDiChloroacetic acid (BDCAA)	71133-14-7
DiBromoacetic acid (DBAA)	631-64-1
ChlorDiBromoacetic acid (CDBAA)	5278-95-5
DiChloroacetic acid (DCAA)	79-43-6
MonoBromoacetic acid (MBAA)	79-08-3
Mono-Chloroacetic Acid (MCAA)	79-11-8
TriBromoacetic acid (TBAA)	75-96-7
Trichloroacetic acid (TCAA)	76-03-9
Dalapon (DCPA)	75-99-0

More information

Samples can be collected at the desired location or at a depot. Eurofins' logistic services can be reached at 0800-0991180 or logistiek@etbnl.eurofins.com.

For additional information regarding analyses, reporting, rates, delivery times, service and more, please contact the designated contact person or the customer service during office hours.

Over Eurofins Environment Testing

Eurofins Environment Testing Netherlands is part of Eurofins Scientific and your partner for environmental testing.

Our goal is to help you achieve your objectives. With efficient and qualitative analysis techniques we support your business processes. Our customer service is at your disposal with specialized knowledge and extensive experience. You can make use of our own packaging and logistics service. Our reliable couriers take care of sample transfer on site and transport the samples to the relevant laboratory the same day.

Eurofins Environment Testing Netherlands is committed to protecting the environment. With our products and services, we support the responsible use and minimization of substances harmful to humans and the planet. Examples include hormones, pesticides, dioxins and heavy metals. By reducing the usage of water, raw materials and energy, we contribute to sustainability. Our laboratories have developed special programs to minimize environmental risks, such as a safe use of chemicals and waste disposal.