HALAMID® MEASURING CONCENTRATIONS AND NEUTRALIZATION

Halamid® is an active chlorine compound, (but not a hypochlorite releasing compound), thus you can easily determine Halamid® concentration in water by measuring the active chlorine content in solution.

To determine the Halamid® concentration, you need a method able to measure both the “free chlorine” and the “total chlorine” concentrations in water. Different equipment is available to measure Halamid® concentration in aqueous solutions. On request we will recommend the most suitable system for your own application.

Definitions

Free chlorine is the proportion of chlorine present in the form of Cl_2, HClO and ClO-.

Bound chlorine is present in the form of chloramines as well as organic chloramines (such as Halamid®). In Halamid® solutions, the only bound chlorine product is Halamid® itself.

Total chlorine is the sum of free and bound chlorine.

The three concentrations are expressed as mg Cl_2/l (ppm).

Halamid®: active chlorine content

To start with, it is important to understand that Halamid® has a theoretical active chlorine content of 25.2%. This can be explained as follow:

The reaction between Halamid® and iodide liberates iodine:
$C_7H_7SO_2NHCl + 2\ HI \Rightarrow C_7H_7SO_2NH_2 + I2 + HCl$

$C_7H_7SO_2NHCl$ = Halamid®

This is comparable to the reaction of free chlorine with iodide:
$Cl_2 + 2\ HI \Rightarrow I_2 + 2\ HCl$

The amount of active chlorine is expressed in terms of elemental chlorine that would have similar oxidizing power. Thus with Halamid®, one atom of chlorine (one molecule of Halamid®) liberates as much iodine as two atoms of elemental chlorine (Cl_2).
So for the pure Halamid® (chloramine-T trihydrate, M = 281.7), the active chlorine is:
2x(35.5/281.7) = 25.2%

(35.5 is the molar mass of Cl_2)

This 25.2% active chlorine content is for the pure trihydrate form. It can slightly vary depending of the amount of crystalline water.

Therefore the Halamid® concentration in solution is directly related to the active chlorine one. Active chlorine being easy to determine, the main methods to measure Halamid® concentration are based on the active chlorine measurement.

Measurement of Halamid® concentrations

To determine the residual Halamid® concentration in water:

- Measure free chlorine concentration.
- Measure total chlorine concentration.
- Calculate (total chlorine) – (free chlorine). This is the bound chlorine concentration in your water (expressed as mg Cl_2/l).
- Multiply this value by 3.97. This will give you the residual Halamid® concentration expressed as its initial form (the tri-hydrate compound).

To make it easier, you can multiply the bound chlorine concentration by 4 instead of 3.97. The error on the final concentration is then less than 1%.

Remark: Halamid® solutions contain only a negligible quantity of free chlorine.

Neutralization

It is sometime necessary to neutralize Halamid®, for example in microbiological efficacy test to control the reaction time or before discharge of a Halamid® solution. The easiest way is to add a reducing agent to the Halamid® solution. Thiosulfate is certainly the most widely used compound for this.

Use biocides safely. Always read the label and product information before use.

Halamid® is an Axcentive product available in various packages, from 2 kg buckets to 1000 kg big bags.

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