



HALAMID® AND AOX

The presence of Absorbable Organic Halogens (AOX) in the environment is a worldwide concern.

Some of the general properties of AOX compounds are:

- at least one Carbon-Chlorine bond (C-Cl) in their molecule
- poor biodegradability
- accumulation in the environment and higher organisms
- high toxicity towards a lot of higher organisms.

The result of these properties is that the AOX compounds are a concern to the environment.

AOX compounds are either directly released into the environment due to human activity or can be formed in the environment by a number of active chlorine products.

Halamid®, although containing an active chlorine atom, proves to be a safe choice with respect to AOX.

Is Halamid® itself an AOX compound?

- No, because the Chlorine atom in Halamid® is directly bound to the Nitrogen atom
- No, because Halamid® is readily biodegradable
- No, because Halamid® does not accumulate in the bio-system

Does Halamid® form AOX compounds during its application?

Chlorinating abilities of Halamid®, sodium hypochlorite and sodium di-chloro-isocyanurate (DCIC) were compared. An equimolar or a ten times molar excess of chlorinator (oxidizing agent) was added to a 100 mg/l phenol (C₆H₅-OH) solution. This excess of chlorinator favors a complete chlorination of phenol (a chemical easily chlorinated) into trichloro-phenol. After fixed time intervals the solution is analysed for its AOX content. Complete chlorination to trichloro-phenol would theoretically result in an AOX content of 113 mg/l.

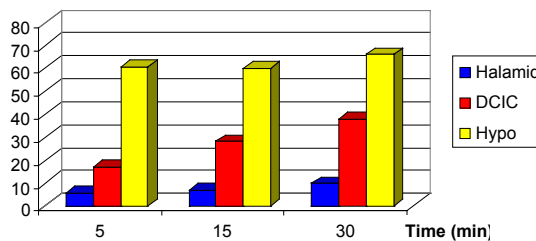
References:

M. Hahn, H.H. Rüttinger, R. Thamm, Labor Praxis, August, 22-27, (1995)
H.H. Rüttinger, R. Thamm, SÖFW-journal, 122 15/96, 1054 – 60 (1996).

AOX formation under neutral conditions

For pH 6-7 the results are shown below.

AOX formation at pH 6-7, molar ratio phenol / chlorinator = 1/10

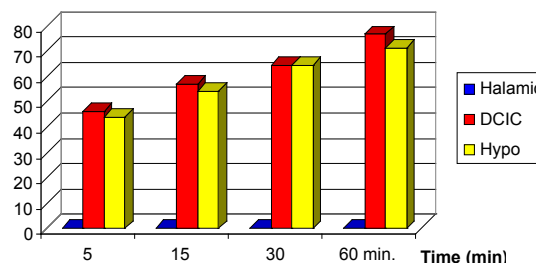


The results show that at pH 6-7 hypochlorite is a very fast chlorinator, quickly coming to a maximum value of approx. 60 % of the theoretically possible amount of AOX (113 mg/l). Dichloro-isocyanurate is a somewhat slower chlorinator, but after 30 minutes almost 40 % of the theoretical possible amount of AOX is formed. Halamid® however, under these -for AOX formation- very favorable conditions, forms less than 10 % of the theoretical possible amount of AOX after 30 minutes.

AOX formation under weakly alkaline conditions

Similar experiments as described above were performed under weakly alkaline conditions (pH 12). The results are presented below.

AOX formation at pH 12, molar ratio phenol / chlorinator = 1/10



At this pH, the chlorinating properties of hypochlorite are somewhat slower and AOX formation reaches 63 % of the maximum amount after 1 hour. With dichloro-isocyanurate AOX load reaches of 66 % of the theoretical maximum after 1 hour. Halamid® at this pH again forms hardly any AOX.

In conclusion, the possible release and formation of harmful AOX compounds into the environment is not an issue with Halamid® compared to known AOX formers such as hypochlorite and dichloro-isocyanurate.

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.

axcentive

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