

ANOXKALDNES

Tracer™ EDTA

Removal of EDTA with AnoxKaldnes™ Moving Bed Biofilm Reactors (MBBRs)

Industrial effluents can often be loaded with special and complex compounds. Some of these compounds are difficult to remove and can also be harmful to the environment and living organisms if left untreated. One example of such a compound is EDTA. EDTA or ethylenediaminetetra-acetic acid ($C_{10}H_{16}N_2O_8$) is a strong chelating agent commonly used in industrial applications due to the strong complexes it forms with many metal ions.

Why is EDTA of concern?

EDTA contributes to the wastewater chemical oxygen demand (COD) (close to the EDTA concentration value) and to the wastewater nitrogen content (approximately 10% of the EDTA concentration). Due to stricter demands for low COD and N discharge, as for many pulp and paper mills, removal of EDTA from the wastewater before discharge may be necessary in order not to exceed COD and N discharge limits. In some cases, there may also be specific discharge limits for EDTA itself since EDTA is potentially harmful in aquatic ecosystems.

Biological treatment of EDTA contaminated wastewaters

EDTA is considered to be slowly biodegradable. AnoxKaldnes has demonstrated the degradation and removal of EDTA in BAS™ and MBBR systems. The MBBR process is a fixed film process which uses carriers with a high protected surface area for biofilm development. As such, EDTA degrading bacteria are able to colonize the media and be retained in the reactor, providing a more compact and robust process for the removal of this contaminant.



Water contaminated with EDTA

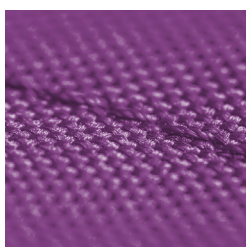
One major application of EDTA is within the pulp and paper industry when pulp bleaching is performed with hydrogen peroxide. EDTA is used in the bleaching process as a chelating agent to bind metal ions, such as ferric or manganese ions, in order to protect the hydrogen peroxide and avoid its decomposition into oxygen and water, which is catalyzed by metal ions. However, as a result of this process, EDTA and its metal complexes end up in the wastewater.

In wastewaters from the pulp and paper industry where EDTA is used, EDTA can be found in concentration ranging typically from 10 to 300 mg/L. EDTA is also used in other industries, such as food and beverage, textile, pharmaceutical and cosmetic industries.

Industrial applications for Tracer™ EDTA MBBRs



Pulp & paper



Textile



Food & beverage



Pharmaceuticals



Cosmetics

Using AnoxKaldnes technologies to remove EDTA

Since the early 2000's, AnoxKaldnes has conducted extensive bench and pilot-scale testing for Swedish pulp mills where one of the biggest challenges was to meet strict nitrogen and EDTA discharge limits. Now with several full-scale Tracer™ EDTA references, AnoxKaldnes nutrient-limited BAS™ and MBBR processes have demonstrated the removal of EDTA from pulp and paper mill industrial effluents.

Feel free to contact us for more information about how AnoxKaldnes Tracer™ technology creates new possibilities in biologically removing harmful compounds in industrial wastewater.

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