

ANOXKALDNES

Tracer™ Perchlorate

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

Industrial effluents can often be loaded with special and complex compounds that are uncommon in conventional biological wastewater treatment. These compounds, while difficult to remove, can also be potentially harmful to the environment and living organisms if left untreated. One of these compounds is perchlorate (ClO_4^-).

Biological treatment with perchlorate

Physico-chemical methods are non-selective, incur high costs and only transfer perchlorate from water to resins or concentrates. In contrast, biological treatment completely degrades perchlorate via dissimilatory perchlorate reduction. Bacteria obtain energy from the reduction of perchlorate into harmless chloride (Cl^-) and water in the absence of oxygen (nitrates and chlorates), and in the presence of a carbon and electron source. When neither oxygen nor nitrates are present, perchlorate can be used as the electron acceptor in the oxidation of the carbon source. Biological treatment of perchlorate can be about 50% less expensive than current state-of-the-art physico chemical technologies.

Why are perchlorate of concern?

Perchlorate is toxic to flora and fauna even at micro-gram levels. Perchlorate affects human health by interfering with iodine uptake by the thyroid gland, resulting in overall decreased production of thyroid hormones.

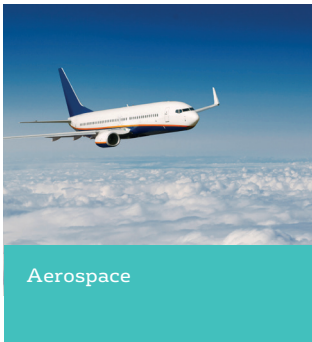
The thyroid regulates growth, development, and metabolism in the human body, and therefore, pregnant women, fetuses, and infants are at high risk. As a result, the level of perchlorate is becoming highly regulated in Drinking water and Groundwater by Water Health Advisory boards all over the world.



Water contaminated with perchlorate

Perchlorate occurs naturally in arid or dry environments as part of ammonium, potassium and sodium salts or phosphorus-containing minerals. However, perchloric acid and perchlorate salts are also artificially produced to be used in the manufacturing of rocket fuel, matches, signal flares, explosives, and fireworks. Perchlorate has become an inorganic contaminant of concern in drinking water, and in public drinking-water sources and distribution systems. For example, groundwaters in areas in close proximity to industries manufacturing perchlorate salts or using perchlorate in countries like France, the United States, China, Israel and Russia, present high risks of perchlorate contamination.

Industrial applications for Tracer™ Perchlorate MBBRs



Using AnoxKaldnes technologies to remove perchlorate

The technical feasibility of using Tracer™ Perchlorate MBBRs has been demonstrated for the treatment of perchlorate-contaminated effluents. Tracer™ Perchlorate MBBRs have the potential to be incorporated as single process solutions or in staged biological treatment processes depending on the treatment requirements and contaminants present.

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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