



EAOP® a radical solution for ...

Total Oxidation

The cleaning of waste waters that are not easily biodegradable or even have persistent diluted organic ingredients is almost not possible with common water treatment technologies

● Mostly incineration is the only possible solution to dispose this liquid waste. In order to avoid of transportation of these liquid wastes the EAOP® is a very efficient alternative to incineration disposal. The produced highly oxidative hydroxylradicals perform a »cold incineration« by oxidizing all organic compounds by water electrolysis. The residual water can be directly discharged in most cases.

An additional advantage of the Total Oxidation with EAOP® is the efficient reduction of halogenated hydrocarbons (AOX). In addition to oxidizing all organic compounds all inorganic compound will be transferred to its highest oxidation number if supported by cell design.

High potential for reaching waste water treatment goals has the Total Oxidation with EAOP® for production waste waters containing organophosphates (C-P) or

halogenated hydrocarbons (C-X (X = F, Cl, Br, I) occurring among other things during production of plastics, plasticizers, flame retardants, extinguishing agents, biocides or pesticides.

Based on the reliability and efficiency of the EAOP® with DIACHEM® diamond electrodes Bayer CropScience has been relying for their waste water treatment on this innovative technology since 2009. The goal of this application is the oxidation of phosphor (III)-molecules. The customized electrolysis cells treat up to 5 m³ per cell and hour.

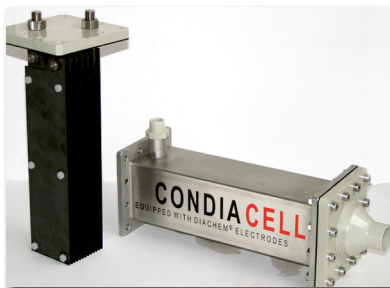
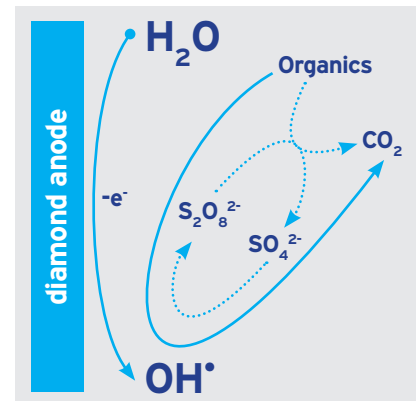
The demand in the EAOP® as an alternative technology with its specific properties is obvious by the amount of projects for customized treatment processes of German chemical industry applications that are running at the moment in cooperation with CONDIAS and its partners.



Technology

The EAOP® describes a mass transport limited oxidation with hydroxylradicals by simple water electrolysis.

Products of this process are the exhausting gases carbon dioxide (at the anode) and hydrogen (at the cathode) as well as mineralized water. For some applications it is helpful to use the oxidation of additives like sulfate/persulfate that are transferring the oxidation from the anode surface into the water volume



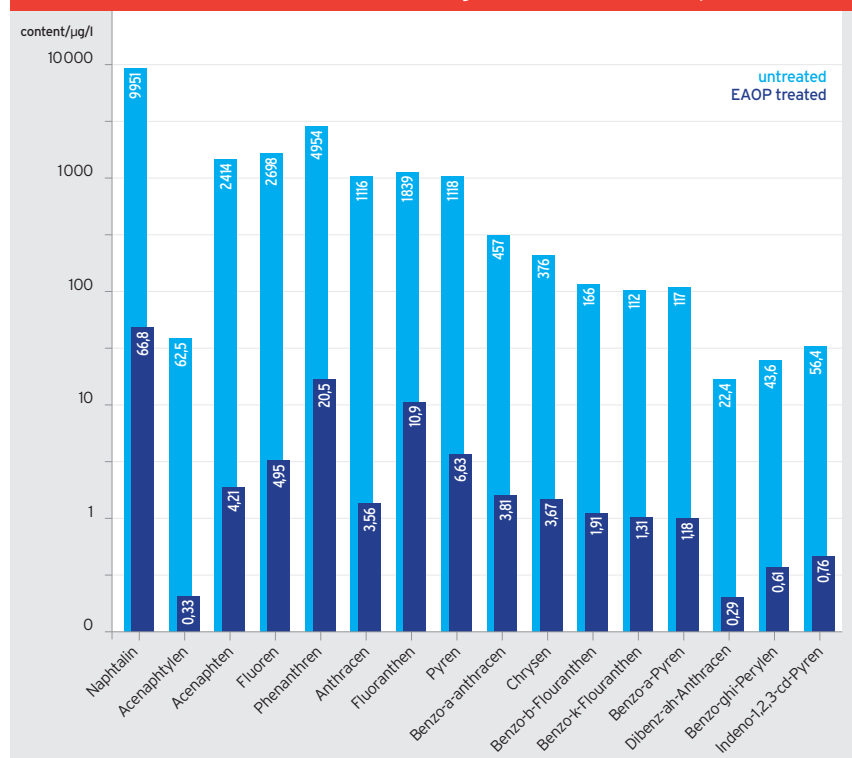
CONDIACELL® reactor with 5000 cm² active anode surface of DIACHEM® electrodes

The Total Oxidation with EAOP® and CONDIACELL® reactors includes a variation of processes and advantages:

- continuous or batch processes
- only current controlled
- low operating costs
- no additional chemicals are needed
- individual modular units for easy scale up
- low maintenance efforts
- easy process control

The EAOP® treatment reduces all organic contaminants by approx. 99% although the initial concentrations are partly already very low. This proves that the high oxidative power of the hydroxyl radicals leads to unspecific oxidation of all organics. That's why the accumulative parameter COD is used in theory and for estimations on organic waste reduction. These data can be used to calculate investment and operation costs in advance. During a feasibility study additional influences are investigated for developing a customized treatment concept.

Results of treatment of groundwater sample



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