

NEW CHEMICAL TECHNOLOGY FOR THE TREATMENT OF WASTEWATER: FLOX PROCESS

An effective, non toxic and cost competitive chemical process has been developed for the treatment of wastewater. Partners to develop the technology and/or to establish commercial agreements are sought.

The Challenge

At present, various methods for treatment of wastewater are known to remove contaminants in order to reuse the water, such as physico-chemical, biological or incineration methods. Advanced Oxidation Processes (AOPs) are in general efficient methods to remove organic contamination that are cheap to install but involve high operating costs due to the excess input of chemicals and/or energy required. Moreover, these methods have some important drawbacks regarding their complexity and, sometimes, their safety and/or efficiency.

The Technology

A new technology for treatment of bio-refractory, difficult wastewaters, has been developed to solve these drawbacks. FLOX process can consume either H₂O₂ or ozone. It is as much effective as conventional AOPs (e.g. Fenton process), but it is able to work in a wide pH range (up to neutral) at lower costs because the lower consumption of several chemicals and the non requirement of any energy consumption, except the energy required for generating the ozone in case of using this oxidizer.

Innovative advantages

- It does not need such an acidic pH as the Fenton process does, so the consumption of acids and bases for subsequent neutralization is much lower.
- It can be carried out at room temperature (unlike incineration) and at atmospheric pressure (unlike wet oxidation or supercritical oxidation).
- Unlike the Fenton process and other AOPs, an excess of chlorides, bicarbonates, bisulfates or other radical scavenger substances or the presence of solids in suspension are not a problem for carrying out the process.
- Neither conductivity of the water (unlike electrochemical processes) nor water color or transparency (unlike the photochemical processes, with visible light or UV lamps) has any effect on said process.
- The process does not require special materials (such as certain electrodes in electrochemical processes).
- The process rapidly and efficiently removes total organic carbon (TOC), chemical oxygen demand (COD), suspended matter, color, odor, cloudiness, ammoniacal nitrogen and toxicity. The treated water is also disinfected by its germicidal action.
- The only investment cost worth pointing out is the ozone generator, only in case ozone is used as oxidizer.
- Operating costs are noticeably lower than those of incineration (due to the huge amount of energy required to evaporate all the water to be incinerated) or those of AOPs, which consume higher amounts of expensive oxidizers.

Current stage of development

The technology has been successfully applied in the laboratory to real wastewater samples and is ready to scale-up to industrial scale.

Applications and Target Market

Flox technology is effective in the oil industry, chemical, pharmaceutical, metallurgical, automotive, residues (landfill leachates), food and beverage and concentrate recovery, among other industries.

Reference number

MKT16_FLOX_C

**Useful for remove
Aromatics, VOCs,
SVOCs, PAHs,
Anilines, ammonia and
nitrogen compounds**



**Combines AOP and
another physico-
chemical treatment in a
single step.**



**FLOX is also an
alternative to hazardous
waste disposal**

Business Opportunity
Technology available for
licensing

Patent Status
Priority application

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