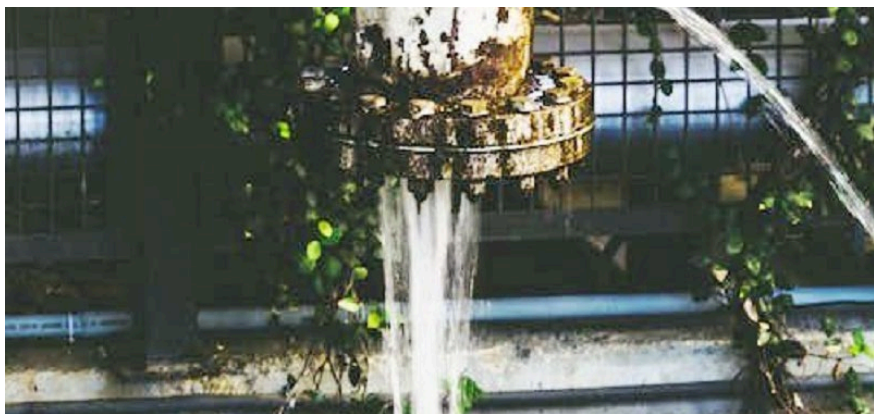


Technology Offer

CSIC/PT/071

Rapid decontamination and disinfection of wastewater



Supported photocatalyst based on titanium oxide (TiO₂) that allows remediation of pesticides in half the time than commercial ones. In addition, it is effective for the elimination of microorganisms. It is therefore ideal for the decontamination and disinfection of aqueous effluents.

Intellectual Property

Priority patent application filed.

Stage of development

Technology tested in lab.

Intended Collaboration

Licensing and/or co-development

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Market need

Heterogeneous photocatalysis is an alternative for the treatment of contaminated water. In this sense, the use of TiO₂ particles in suspension has proven to be efficient in the non-selective photodegradation of organic pollutants, but the impossibility of separating and recovering the solid from the treated effluent hinders its real application.

An alternative would be the immobilization of the photocatalyst on supports that allow its easy recovery and reuse. However, the deposition of the photocatalyst on a support often leads to a drastic loss of activity, making the process unfeasible.



Proposed solution

The developed photocatalyst is based on TiO₂ particles with iron oxide nanospheres. The photocatalyst particles are immobilized on glass fibers allowing for easy recovery and reuse.

The design allows for complete photodegradation in only 120 min. when acting on a pesticide mixture, which is less than half the time required by its commercial counterparts. In addition, the immobilized photocatalyst shows mineralization above 85%, revealing effective photodegradation of most of the intermediate compounds produced during decomposition of pesticides. It ensures the harmlessness of the final effluent. It also has a proven biocidal effect.

Competitive advantages

- It is twice faster than its commercial counterpart.
- Easy to obtain and reproducible to industrial scale.
- Possibility of recovery and reuse without losing its activity.
- Proven effectiveness in remediation and bioremediation of wastewater.