

New chemical method makes it easier to extract pollutant pesticides from water

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Credit: Asociacion RUVID

Researchers from the Department of Analytical Chemistry and the Institute of Materials Science (ICMUV) of the University of Valencia (UV) have developed a method for the detection in water of PFRs (organophosphate flame retardants), compounds used in pest control that cause serious health and environmental problems due to their accumulation.

Enric Pellicer, researcher in training at the Department of Analytical Chemistry and first author of the article where the method is explained, highlights: "This work is one more example of the great versatility of mesoporous silica materials for the retention of organic compounds of very diverse sizes and characteristics. This offers a great variety of applications, including its use for the extraction of contaminants such as flame retardants."

Carolina Belenguer, José Manuel Herrero and Adela Mauri also participated in this article by the UV.

PFRs are considered a more sustainable alternative to traditional pesticides. However, they are considered emerging pollutants because their release and persistence in the environment has shown that they can have carcinogenic effects. These compounds are mainly used in the [agricultural industry](#) and the main route of transmission is through the digestive tract.

The method developed by the research team at the University of Valencia and published in Journal of Chromatography is based on the solid phase extraction of the PFRs present in environmental water samples and uses a combination of titanium and silica as absorbent. This works in a similar way as a filter, selecting the particles of interest.

Compared to the procedures used so far, this method is more efficient, simple, economical and respectful with the environment, since it can be

reused a minimum of three times and it requires less amounts of sorbent. On the other hand, although the volumes of environmental samples that are analyzed with it are lower, it has been observed that the extraction levels are comparable or improved with respect to the other methods.

More information: Enric Pellicer-Castell et al, Enhancing extraction performance of organophosphorus flame retardants in water samples using titanium hierarchical porous silica materials as sorbents, *Journal of Chromatography A* (2021). [DOI: 10.1016/j.chroma.2021.461938](https://doi.org/10.1016/j.chroma.2021.461938)

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