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Photocatalytic Materials Immobilized On Recycled Supports as Alternative In the Degradation of Water Contaminants.

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Abstract **-** Global concern about water pollution has increased in recent times due to the cumulative harmful impact on the human health caused by the various toxic substances released into waters such as rivers and dams. Fresh water reduced availability for human consumption and its pollution have been paid so considerable attention due to their relevance in human consumption, agricultural and industrial use. In this context, the photocatalytic processes together with adsorption, have shown their utility due to features such as practical application, low-cost, harmless effects and sustainable decontamination effectiveness. This talk focuses on our group studies, where efforts being made to use recycled materials as supports for decontamination applications such as the removal of different pollutants (dyes, pharmaceutical contaminants, and pesticides) found in aqueous environments have been reported. Everyday materials such as polyethylene terephthalic (PET), polystyrene spheres (PS), agave fibers, waste glass substrate and cellulose from natural plants have been employed as supports for immobilizing catalysts. The present work offers a discussion of the ways through which photocatalytic nanomaterials have been immobilized or produced, employed characterization techniques, removal efficiencies achieved during photocatalytic degradation These new practical tools stand as novel sustainable strategies for the removal of emerging contaminants reusing waste flexible materials.
Keywords**:** Photocatalysis; recycled supports; catalyst immobilization; contaminant removal; water purification.

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References

[1] J. Oliva *et al*., "A sustainable composite of rice-paper/$BaMoO_4$ nanoparticles for the photocatalytic elimination of the recalcitrant 2,6-dichlorobenzamide (BAM) pesticide in drinking water and its mechanisms of degradation." *Environ. Sci. Pollut. Res.* 29, 59915–59929 (2022).

[2] E. Valadez-Renteria *et al*, "*Novel sustainable composites made of car's waste and sodium titanate for the efficient photocatalytic removal of the bromophenol blue dye: study under solar and UV–Vis light"*. Environ Sci Pollut Res 29, 76752–76765 (2022).

[3] P. C. Hernandez-Del Castillo *et al*, "*An eco-friendly and sustainable support of agave-fibers functionalized with graphene/TiO_2:SnO_2 for the photocatalytic degradation of the 2,4-D herbicide from the drinking water*". J. Environ. Manag. 317, 115514 (2022).

[4] E. Valadez-Renteria *et al*, "*A novel and stretchable carbon-nanotube/Ni@TiO_2:W photocatalytic composite for the complete removal of diclofenac drug from the drinking water*" J. Environ Sci, 126, 575-589 (2023).

[5] P.C. Hernandez -Del Castillo *et al*, "*Efficient visible photocatalytic degradation of 4-CP herbicide using immobilized TiO_2:Ni on glass substrate*". Topics Catal., 65, 1139-1148 (2022).

[6] E. Valadez-Renteria *et al*, "*A novel floating compound based on a plastic sphere coated with tin titanate for the removal of the herbicide fomesafen*" J. Clean. Prod. 379, 117057 (2023)