Upcycling biomass waste into Fe single atom catalysts for pollutant control

10.03.2022 - Plants contaminated by heavy metals and antibiotic abuse are two major issues currently facing human sustainable development, as they directly affect food security and drinking water safety. Both pollutants are environmentally persistent and toxic, and can cause potential and long-term negative effects to human health as well as the ecological environment. Rising concerns regarding the addressed issues have all stimulated the search for a more sustainable, eco-friendly solution.

Recent advances in the deconstruction of Fe-contaminated biomass waste to obtain Fe-SAC containing FeN4 active sites as a photocatalyst to remove antibiotics, which embodies the concept of sustainable development and pollutants control.

Utilizing heavy metal contaminants for catalytic degradation of antibiotics is one particularly promising strategy for processing both contaminants conceptionally. Fe single-atoms confined by a hierarchical porous carbon framework have been fabricated successfully from Fe-contaminated biomass waste ferns for the efficient photocatalytic removal of six typical antibiotics.

Recently, Prof. Kai Yan from Sun Yat-Sen University and Dr. Wenhao Luo from Dalian Institute of Chemical Physics have developed a sustainable methodology to promote the sustainable utilization of biomass waste for the efficient remediation of antibiotic pollution.

This work demonstrates that utilizing Fe-contaminated biomass waste ferns is an appealing and facile strategy for the synthesis of highly active and stable single atom catalysts, and is relevant for pollutant control among other applications.

Original publication:

Xin Li et al.; "Upcycling biomass waste into Fe single atom catalysts for pollutant control"; Journal of Energy Chemistry; Volume 69, June 2022, Pages 282-291