

Advanced sustainable materials derived from the valorization of agri-food and industrial waste, creating value and new business models based on the circular economy.

Recovery of industrial waste in a sustainable and profitable way

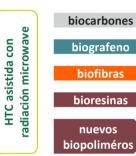
We assist our clients in finding new business opportunities through recycling and valorization of materials and waste using processes like hydrothermal carbonization (HTC) assisted with microwaves, pyrolysis, and other proprietary know-how processes.



...and the creation of state-of-the-art materials for technology companies.

Materials engineering enhances performance through changes or modifications to the material. We create composite biomaterials and biobased biocomposites using polymers, biographene, natural fibers, etc.

We impart various properties to these composite biomaterials such as strength, conductivity, thermal stability, sensitivity to stimuli, hydro-thermophotochromism, photoluminescence, etc.





colulosa funcionale



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Machine learning and neural networks

Our upcoming patents are based on experimental development of HTC (hydrothermal carbonization) processes assisted with microwaves, utilizing available variables such as precursor characteristics, prior physical treatment, temperature and its gradient, pressure, residence time, phases, catalysts, etc., all tailored to achieve the desired target material. We initially employ active learning, which relies on a small dataset, selection of the learning model (regression algorithms, decision trees, neural networks, SVM), initial training, model evaluation, selection of informative instances, labeling, model update, iterative evaluation, and a stopping criterion.

Currently, we are applying this model to enhance the adsorption surface of activated carbon and optimize the number of phases efficiently. The significant advantage lies in the substantial reduction of the number of iterations required to achieve the best result, leading to cost savings and improved operational efficiency.



laboratory and contracts with OPIS

