

NEWSLETTER 02

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OUR RESEARCH COMMITMENT TOWARDS THE DEVELOPMENT OF NEW CATALYTIC MATERIALS FOR INDUSTRIAL WASTE UPGRADING

Waste management is of immense importance for our societies: from inception to final disposal. In this line, since its start in Spring 2020, the Franco-Spanish TRIPyr project is interested in the valorization of industrial residues related to agri-food (fatty residues) and pesticide (lindane) enterprises. The present letter, focused on the TRIPyr academic partners, opens a series of publications to introduce the Consortium members and their activities in this project.

Three laboratories constitute TRIPyr's research core: ICIQ, CHESO and LHFA, bringing their expertise and know-how on the design of sustainable transformations thanks to the use of catalysis, mimicking the natural enzymatic processes.

A catalyst is a substance able to change the pathway of a chemical reaction by increasing its rate and decreasing energy consumption, while not being consumed during the process. This allows the catalyst to act repeatedly, so not only it is needed in a small amount, but it can also be recycled and reused. Many types of catalytic materials and waste-upgrading reactions can be conceived, the only limit is the imagination of the chemists! Within the frame of the TRIPyr project, the researchers are focused on using different types of catalysts, from molecules to nanoparticles, in order to transform the raw materials into target products of interest, such as drugs and (bio)polymers, while reducing the carbon footprint associated to human activities.

On the Spanish side, in Tarragona, ICIQ is engaged in the development of molecular organocatalysts and organometallic catalytic materials (namely, compounds that combine both organic molecules and metals). Besides, the ICIQ researchers aim at developing these materials with abundant and non-expensive metals (Iron, Nickel, Aluminium) in order to overcome any potential shortage associated to classical catalysts, currently used in industrial processes.



Corinne Trabbia (Left) and Ekaterina Mamontova (Right)

On the French side, in Toulouse, LHFA researchers focus on the design of metal catalysts at nanometric scale (10^{-9} m), used to size viruses, proteins or antibodies. Such catalytic materials, constituted of assemblies of atoms, exhibit a unique reactivity, coming from the synergy between these atoms and the high-surface area of nanosystems. Thus, the reactivity of nanoparticles obtained from abundant earth metals (Copper, Cobalt, Nickel) can provide novel strategies for the activation of recalcitrant bonds, frequently present in the residues, leading to waste transformation under mild conditions.

Based in Zaragoza, CHESO group contributes to this project with its expertise in heterogeneous catalysis, facilitating a reaction to occur at the interface between phases, thus enabling an easy recycling. The development of such recoverable catalytic systems and green solvents yields new synthetic possibilities in the conversion of chlorinated pesticides and fatty wastes.

Complementary in their backgrounds, the research groups commit to develop new eco-responsible processes in the recovery of different industrial waste products for their further validation at a pilot scale in the frame of TRIPyr, ultimately leading to their implementation in industry.

To know more about the TRIPyr project and its Consortium, visit : www.tripyr.eu

TRIPYR RECRUITMENT: WELCOME TO THE NEW MEMBERS!

TRIPyr promotes the recruitment of young researchers for training them in the development of circular chemistry, project management and scientific dissemination. We welcome to the LHFA team, Corinne Trabbia, PhD Student, and Ekaterina Mamontova, Project Officer. Thanks for joining the ECOCENE association, Emilie Tisé, communication assistant. The skills, experience and creativity of our new members will help to realize the TRIPyr project !

TO YOUR AGENDA !

May 2-5, 2021, Toulouse
European conference on inorganic reaction mechanisms

June 21-25, 2021, Albi
Summer School in Catalysis

July 4-9, 2021, Toulouse
XIX International Symposium on Silicon Chemistry

September 5-7, 2021, Tarragona
13th Spanish-Italian Symposium on Organic Chemistry (SISOC-XIII)

