

NEWSLETTER 08

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TRIPYR, A FRUITFUL POCTEFA PROJECT FOR THE VALORIZATION OF WASTES SHOWING A STRONG ENVIRONMENTAL IMPACT IN THE TRANS-PYRENEAN REGIONS

TRIPyr, a POCTEFA project with the goal to develop novel (nano)catalytic approaches to enable the valorization of lindane and fatty wastes as feedstock in a circular chemistry approach. Industrial use of such wastes presented an excellent opportunity to develop the next generation of catalysts made from Earth abundant elements.

The meeting counted with the participation of all TRIPyr partners: (CHESO (Zaragoza), ICIQ (Tarragona), LHFA-CNRS (Toulouse), MEPI (Toulouse), SAPOVAL (Albi) and ECOCENE (Pau)). They presented the results achieved during a two-day event held at the University of Pau and Pays de l'Adour in Pau (France) on May 2-3, 2022, including a visit to the facilities of the Institute of Analytical Sciences and Physico-Chemistry for Environment and Materials (IPREM).

As in the previous meeting, invited speakers from both academia and industry participated to the event: Prof. Luigi Vaccaro (University of Perugia, Italy), Dr. Pascual Oña (Instituto de Tecnología Química, Valencia, Spain) and Dr. Coralie Jehanno (Polyker, San Sebastian, Spain).

The ICIQ, CHESO and LHFA-CNRS research labs have developed innovative catalytic methods to valorize industrial residues impacting the trans-Pyrenean area into value added products. They have also contributed to boost this circular strategy, not only from a fundamental research point of view but also by hiring young researchers and contributing to their training in sustainable chemistry and processes.

Design of novel catalysts, including nanomaterials, has been conceived for upgrading pesticide and fatty wastes.

One target has focused on the conversion of gamma-hexachlorocyclohexane (γ -HCH), the chlorinated compound and main component of the Lindane toxic pesticide, into useful alicyclic and aromatic intermediates. Another approach has targeted the catalytic conversion of fatty acids from the agri-food industry, especially crude duck fat residues, into polyesters and polyhydroxyurethanes using molecular catalysts. Furthermore, the total hydrogenation of fatty residues provided by SAPOVAL has been achieved with supported nanocatalysts based on Earth abundant transition metals (Nickel, Cobalt).

Scale up processes, both discontinuous (AIN) and continuous flow intensification (MEPI) strategies could be studied for the synthesis of nanomaterials and catalytic hydrogenation processes.

OUTLOOK

The collaboration between academic research laboratories (CHESO, ICIQ and LHFA-CNRS), technological centers (MEPI and AIN) and the company SAPOVAL in the framework of TRIPyr has provided the complementary expertise not only to develop innovative catalyst research capable to transform real wastes at laboratory scale, but also to study the scaling up and implementation of such strategies in batch and through flow chemistry intensification.

The valorization of wastes present in the Trans-Pyrenean regions via the development of innovative strategies has been at the heart of TRIPyr to reduce the industry reliance on imported raw materials by improving competitiveness, strengthening sustainability and also reducing risks.

