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Sustainable chemical engineering of renewable resourcesM A Martin-Luengo¹, M Yates¹, M Ramos², F Plou¹, A M Martinez Serrano¹, V Zurdo¹ and A Civantos³¹Consejo Superior de Investigaciones Científicas, Spain²Universidad Politécnica de Madrid, Spain³Complutense University of Madrid, Spain

The use of agro-industrial wastes is a prime target of utmost importance nowadays, because solutions to environmental pollution problems are crucial to achieving sustainable development and this approach can have a significant contribution towards the so called Renewable Raw Materials (RRM). This topic is considered today as one of the main scientific goals at international level, given its social, economic and environmental interest. Using waste to obtain useful materials avoids the expense of others often non-renewable materials, among many other benefits. Research groups are working on the application of the philosophy called cradle to grave in which companies may be able to convert their wastes into useful materials for themselves or others, thus closing a cycle of obvious benefits. Furthermore, the developed processes are based also on avoiding the use of toxic substances to the environment and achieve maximum economy and reduction of energy expenditure, i.e., by using renewable vs. conventional energy demanding ways of activation. Given their origin, the materials derived can be considered Ecomaterials. Some of the processes that have been implemented in our research group are: (1) Immobilization of enzymes and their use in biocatalytic processes (biodiesel and nutraceuticals production). (2) Renewable biomaterials are being used as matrices for regenerative medicine, based on analysis of their toxicities and their ability as scaffolds for cell growth. (3) Conversion of liquid wastes to fine chemicals and biohydrogen, avoiding the need to use petroleum derivatives. (4) Catalysts for environmental protection and (5) MultivalORIZATION of agriwastes.

Biography

M A Martin-Luengo has studied Chemistry in the Autonomous University of Madrid, Spain. At Consejo Superior de Investigaciones Científicas (CSIC), Spain; she presented her Masters work on Oxidation Catalysts and her PhD on Hydrogenation Catalysts. As a Postdoctoral grant holder of the CSIC she has worked in Brunel University, UK and in the University of Louvain la Neuve, Belgium. She has worked as a Fellowship IA with the Scientific Engineering Research Council, UK, on Fischer-Tropsch and from 1992 she is permanent Scientific Staff of CSIC, Spain. She has participated in more than 25 research projects, 100 scientific papers and chapters of books, 120 congresses and several patents. She is a Chartered Chemist of RSC and Member of ACS and the Spanish Societies of Catalysis and Clays. Presently she carries out studies on sustainable issues, searching for the use of renewable materials, energies and chemical processes, especially giving priority to countries with deprived economies.

mluengo@icmm.csic.es

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