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Green extraction of food ingredients and natural products: Moving from academia to innovative and large-scale applications

This presentation will introduce a new and innovative area in the frontiers of chemistry, biology, and processing: green extraction with special emphasis on natural products. Green Extraction is a part of the sustainable development concept; its history, concept, principles, and fundamentals will be described. We will pay special attention to the strategies and the tools available to make biorefinery greener. The representation will present the innovative research in this area these past five years in terms of innovative techniques (microwave, ultrasound, pulsed electric field...) and alternative solvents (ionic liquids, sub and supercritical fluid, agro solvents, water...) applied to this new area green extraction of natural products with special examples applied to biorefinery concept. A general definition of green chemistry is the invention, design, and application of chemical products and processes to reduce or to eliminate the use and generation of hazardous substances. In relation of green extraction of natural products, this definition can be modified as follows: "Green Extraction is based on the discovery and design of extraction processes which will reduce energy consumption, allows the use of alternative solvents and renewable natural products, and ensure a safe and high-quality extract/product". The listing of the six principles of green extraction of natural products should be viewed as industry and scientists as a direction to establish an innovative and green label, charter and standard, and as a reflection to innovate not only in process but in all aspects of solid-liquid extraction. The principles have been identified and described not as rules but more as innovative examples to follow discovered by the scientist and successfully applied by industry.

Biography

Farid Chemat is a Professor of Chemistry at University of Avignon, France; Director of GREEN Extraction Team (alternative extraction techniques and solvents); Co-Director of ORTESA LabCom research unit Naturex-UAPV and; Scientific Coordinator of France Eco-Extraction dealing with dissemination of research and education on green extraction technologies. His main research interests are focused on innovative and sustainable extraction techniques, protocols and solvents (especially microwave, ultrasound and bio-based solvents) for food, pharmaceutical, fine chemistry, biofuel, and cosmetic applications. His research activity is documented by more than 170 scientific peer-reviewed papers, 10 books and 10 patents.

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