



## Foreword

# International Symposium 'Green Chemistry' Poitiers, France, 19–22 May 2003

In various reports describing the future trends of science in France, Europe, Japan, USA, there are strong recommendations for 'caring for our planet'. At the beginning of the new millennium, the environment protection represents one of the important task forces of Science and Society. There are different ways for that purpose and the use of renewable raw materials is one of them. In *Chemistry: Europe and the future*, prepared by the Alliance for Chemical Sciences and Technologies in Europe (AllChem E), there was the following paragraph:

"The use of natural fats and oils, sugars and starch as raw materials in the chemical industry is both a challenge and an opportunity. It is a challenge because of the problem of integrating natural products, which often have very complex compositions, into modern processing and production pathways. These production processes are often limited by ecological and economical considerations and must produce marketable products. It is an opportunity because the use of natural products, which are renewable resources, can be seen as a long-term contribution to sustainable development."

Non-fossil raw materials are becoming an area of growing interest for oleoindustry. Up to now, oleoindustry was essentially focused on the chemistry of the functional group  $-\text{COO}-$  of the fatty derivatives, but more recently the modern synthetic methods such as the additions (radical, electrophilic, nucleophilic or catalysed by transition metals) on the double bond  $\text{C}=\text{C}$  of the fatty acids led to a broad range of new derivatives of the fatty substances, with interesting properties. In a similar way, functionalisation of the  $\text{CH}$  bonds of the alkyl chain (with high selectivity), the use of catalyst for the ester metathesis of fatty acids ( $\omega$ -unsaturated derivatives) and the epoxidation of un-

saturated fatty acids have been also extensively developed. It is interesting to note that due to the great contribution of the genetic for the production of new crops (without irreversible modifications), scientists expected new renewable raw materials with better quality, compatible with the modern industrial processes and able to allow the development of products with entirely new properties. Finally let us announce that the chemistry of the fatty substances is accompanied by production of a significant quantity of glycerol, a matter which should imperatively been developed. In the case of sugars, there are opportunities for new applications in medicine and crop protection as well as in cosmetics and in the production of fine chemicals.

In *Chemistry for the Third Millennium*, the Chemical Sciences department of the CNRS also wants to face these challenges and promote an 'Active chemistry'. One of the most engaged departments for the environment protection is associated with other departments (Life or Universe Sciences) and other research centres (CEA, INRA, IFREMER, etc.) in inter disciplinary programs, and three major actions: Green Chemistry (preventive chemistry, clean processes...) Curative Chemistry (decrease of pollutants emission, etc.) and Development of Analytical Techniques.

Finally, all over the world, the challenges of Science, and especially that of chemical industries are quite similar with a strong recommendation for an improved efficiency in all processes and in the use of alternative raw materials.

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