

New Syntheses with Oils and Fats as Renewable Feedstocks for the Chemical Industry

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Fats and oils are at present the most important renewable raw materials for the chemical industry and it can be expected that their importance will steadily increase in the future.^[1] Beginning with a discussion of the relevance of renewable raw materials for a sustainable development,^[2] the contribution will discuss current developments in oleochemistry. A large number of novel fatty compounds have been synthesized by C,C-bond forming addition reactions to the C,C-double bond of unsaturated fatty compounds. Radical reactions such as the solvent-free addition of α -halocarboxylic acid esters initiated by electron transfer e.g. from copper to give fat-derived γ -lactones are described as well as Lewis acid induced electrophilic addition reactions yielding new oleochemicals such as alkyl substituted 4-chlorotetrahydropyrans, primary homoallylic alcohols, β,γ -unsaturated ketocarboxylic acids and Diels-Alder additions.^[3] Finally, the question will be discussed which chemical reactions and processes have to be developed to enhance the application of fats and oils in the chemical industry, especially for the synthesis of base chemicals.

^[1] U. Biermann, W. Friedt, S. Lang, W. Lühs, G. Machmüller, J.O. Metzger, M. Rüsch gen. Klaas, H.J. Schäfer, M.P. Schneider, "New Syntheses with Oils and Fats as Renewable Feedstock for the Chemical Industry", *Angew. Chem.*, **2000**, *112*, 2292-2310, *Angew. Chem. Int. Ed.* **2000**, *39*, 2206-2224.

^[2] Jürgen O. Metzger, Marco Eissen, "Concepts on the contribution of chemistry to a sustainable development: Renewable raw materials", *C. R. Chimie*, **2004**, *7*, 569-581.

^[3] U. Biermann, J. O. Metzger, "Catalytic C,C-Bond Forming Additions to Unsaturated Fatty Compounds", *Topics in Catalysis*, **2004**, *38*, 3675-3677.