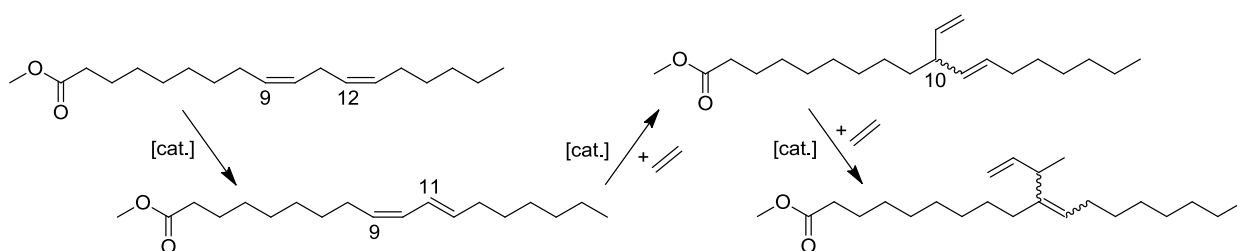


# Production of Branched Fatty Compounds in Miniplant Scale

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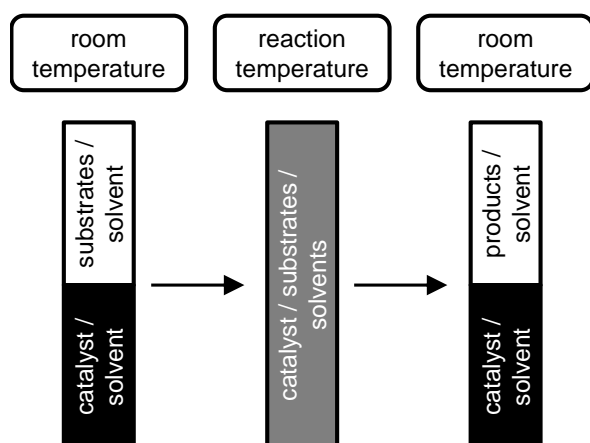
Dortmund, Germany

The advantageous chemical and physical properties of branched fatty derivatives are known since the 1950s [1]. Today branched fatty derivatives are produced in low production output by *Guerbet*-dimerization and as side products by di- or trimerization of fatty acids [2-3]. In this study we present the homogeneous catalyzed production of branched fatty derivatives by cooligomerization of linoleic acid derivatives with ethylene.



## Conjugation and cooligomerization of linoleic acid methyl ester with ethylene

For this production route a thermomorphic solvent system was developed to recycle the homogeneous catalyst [4]. At room temperature the fluid reaction mixture consists of two phases, a polar catalyst/solvent and a nonpolar substrate/product/solvent phase. At reaction temperature the fluid reaction mixture is single phased caused by the temperature dependent solubility. In this course, a production process was developed and a miniplant was designed and built to scale up the laboratory experiments into the continuous miniplant scale.



[1] J. Cason, W. Robert Winans; J. Org. Chem. **1950**, *15* (1), 139-147.

[2] U. Biermann, J.O. Metzger, Eur. J. Lipid Sci. Technol. **2008**, *110* (9), 805-811.

[3] F.D. Gunstone, Eur. J. Lipid Sci. Technol. **2001**, *103* (5), 307-314.

[4] A. Behr, L. Johnen, A.J. Vorholt, ChemCatChem **2010**, *2* (10), 1271-1277.