

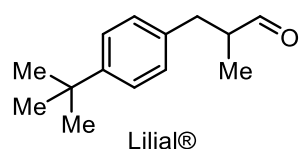
Hydrogenation and Hydroformylation Reactions for the Synthesis of New Perfumery Ingredients

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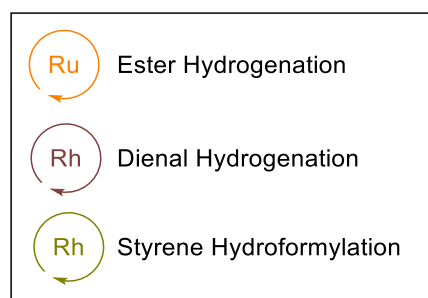
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Research into new industrial catalytic processes is a key focus of dsm-firmenich's S&R, forming a strategic pillar for sustainability goals. The development of industrial homogeneous catalytic hydrogenation processes began nearly 25 years ago with the synthesis of non-racemic cis-methyl dihydro-Jasmonate and has since become a well-established research area.[1, 2]

This presentation will highlight several catalytic processes for synthesizing important perfumery ingredients, especially Muguet-type aldehydes that have appeared in recent years to replace the highly used Lilial®.[3, 4]



Muguet Aldehydes Catalytic Processes



We will start with the two-step process for forming aldehydes from esters using robust, readily prepared ruthenium complexes for selective hydrogenation under mild conditions. This field has since advanced with new catalysts based on ruthenium, iron, cobalt, and manganese. Next, we will discuss new rhodium complex for the selective hydrogenation of conjugated dienals into gamma-delta unsaturated aldehydes, avoiding over-hydrogenated alcohol side products as an alternative to Claisen rearrangement. We will conclude by the direct synthesis of Muguet-type aldehydes via regioselective hydroformylation on styrene derivatives.

Literature:

[1] Dobbs, D. A.; Vanhessche, K. P. M.; Braz, E.; Rautenstrauch, V.; Lenoir, J.-Y.; Genêt, J.-P.; Wiles, J.; Bergens, S. H. *Angew. Chem. Int. Ed.* **2000**, 39, 1992-1995. [2] a) Saudan L. *Acc. Chem. Res.* **2007**, 40, 1309-1319. b) Saudan L. *Chimia* **2019**, 73, 684-697. [3] Carpenter, M. S.; Easter, W. M. GB798901, Givaudan SA (1956). [4] For a list of muguet aldehydes, see E. Ohrmann, V. Chandrasekaran, B. Hölscher, P. Kraft *Helv. Chim. Acta* **2023**, 106, e202300040.