

Towards More Efficient and Sustainable Processes in the Fine Chemical Industry

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The fine chemical industry is under a constant pressure to further improve current production processes and implement new technologies that allow radical new synthetic approaches or significantly improve existing synthetic routes.[1] This need is caused by continuously decreasing product prices and the need to stay competitive in a highly unpredictable market. Especially for products in the lower price segment, such as a variety of vitamins,[2] the large fluctuation in raw material prices and energy costs, significantly influence production prices. These market conditions make the realization of current and future sustainability targets (such as NetZero 2050 for DSM) even more demanding and ambitious.

The transformation of the fine chemical industry can be only achieved by the use of various technologies enabling “greener” production methods in the future, aiming at better energy efficiency, new starting materials, a more efficient down-stream processing, and naturally derived ingredients for the product form development. This talk will showcase various process modifications that effect process critical parameters and allow an adaptation towards more sustainable and efficient production processes, with deeper insights into specific products e.g., isoprenoids like vitamin A, E, carotenoids, and others.

- [1] Bonrath, Werner, Medlock, Jonathan, Müller, Marc-André and Schütz, Jan. *Catalysis for Fine Chemicals*, Berlin, Boston: De Gruyter, 2021. <https://doi.org/10.1515/9783110571189>.
- [2] Eggersdorfer, M., Laudert, D., Létinois, U., McClymont, T., Medlock, J., Netscher, T. and Bonrath, W. (2012), One Hundred Years of Vitamins—A Success Story of the Natural Sciences. *Angew. Chem. Int. Ed.*, 51: 12960-12990.