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Novel Application of a PEEK membrane reactor – Highly Stable Continuous Operation of Hydroamination Reaction of β-Myrcene with Morpholine

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Abstract

Still, the hydroamination of 1,3-dienes to form allylic amines in a continuous operation is a challenging task. In this work, we present the application of a membrane reactor by the implementation of a continuously operated hydroamination reaction of β-myrcene with morpholine. *Via* utilization of a Poly-Ether-Ether-Ketone (PEEK) membrane in a reaction vessel an integrity of reaction/separation in one unit was formed. Preliminary, the kinetics of the hydroamination reaction was determined and the characteristic properties of the membrane were detected. Incorporate all influences on the hydroamination reaction the optimal reaction conditions were modelled. Adjusting these results in the continuous flow reactor furnishes a high increase of the turn-over-number (TON) from 460 to 5135 compared to a batch process. The desired geranyl amines were obtained in very good yields higher than 80% and an excellent conversion of β-myrcene above 93% was reached in a long-time stable process.[1]

References

[1] D. Vogelsang, J. M. Dreimann, D. Wenzel, L. Peeva, J. da Silva Burgal, A. G. Livingston, A. Behr, A. J. Vorholt, *Catal. Sci. Technol.* **2017**, submitted.