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Hydrogenation of aliphatic alkenes in a high-temperature high-pressure packed-bed microreactor

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Heterogeneously catalyzed hydrogenation reactions under high pressure and at high temperature are especially interesting for the petrochemical industry. Hydrogenation reactions of aliphatic alkenes are preferably realized under such conditions in the presence of a solid catalyst. Working under these conditions also places high demands on the equipment even at the early laboratory stages where new processes are being developed and existing ones optimized. The reactor setup does not only need to withstand the high thermal, mechanical and chemical impact of the processes, but also has to provide a precise temperature control as well as short and well-defined residence times. This contribution presents results of the characterization of a new high-temperature high-pressure integrated packed-bed microreactor (MCTU 600 from Ehrfeld Mikrotechnik BTS GmbH) for lab-scale catalyst testing. As the model reaction we used the hydrogenation of C4-C5 aliphatic alkenes heterogeneously catalyzed by Pt/Al₂O₃ or Pd/Al₂O₃.