

Recycling of Spent FCC Catalysts – Production of Industrial Catalyst and Valuable Materials

M. S. Marschall, M. Ritschel, M. Hauck, O. Busse, J. J. Weigand
Technische Universität Dresden, Germany

Abstract

For the production of fuels and basic chemicals, the Fluid Catalytic Cracking (FCC) process uses 2,300 tons of catalyst per day. During the FCC process, the catalysts are subject to irreversible deactivation (poisoning, fouling etc.). The spent catalyst is known to be unusable for further cracking processes. Currently, the spent catalyst is either used as waste in cement processing or stored in landfills.

In literature, spent FCC catalysts are mainly recycled with respect to the recovery of rare-earth metals that are used as stabilizers. For a circular economy, ReCaLI project (Recycling of Catalysts Locally) focuses on the development of recycling concepts in cooperation with an Asian refinery group and other partners in order to utilize all components of spent FCC catalyst. Thus, it is intended to either use the matrix for the synthesis of fresh FCC catalyst in order to close a recycling loop or to synthesize value added products.

In this context, first active materials are obtained from spent FCC catalyst. Special focus was set to zeolites such as faujasite and Linde type A. Other potential catalyst components can be produced such as binder and filler or starting materials for synthesis.

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