Dokumenttyp:  Journal Article


Titel des Beitrags:  Sorption and diffusion parameters from vacuum-TPD of ammonia on H-ZSM-5

Abstract:  This work aims at filling the gap in vacuum-TPD modeling methodology for microporous samples. The specific objective was to assess and distinguish external and internal mass transfer effects from the intrinsic sorption dynamics during temperature-programmed desorption, as illustrated by ammonia on H-ZSM-5. The external mass transfer pattern was confirmed to be free of bed-depth effects, the intraparticle mass transfer resistance proved to be significant in the ammonia-TPD system, and equipment-related artefacts showed to be negligible based on preliminary experiments. Thus a consistent set of 10 TPD curves was collected, including two adsorption temperatures, three heating rates and two separate particle fractions. The experimental data was successfully modeled with a system including intraparticle mass transfer phenomena and intrinsic sorption kinetics. By combining a transient kinetic approach to a well-designed set of high-quality experiments vacuum-TPD can provide decoupled information on mass transfer and sorption for porous materials as we demonstrate in this work. (C) 2012 Elsevier Ltd. All rights reserved.

Kongresstitel:  ISI Document Delivery No.: 086NG

Times Cited: 0 Cited Reference Count: 60 Kouva, Sonja Kanervo, Jaana Schuessler, Florian Olindo, Roberta Lercher, Johannes A. Krause, Outi Krause,
The authors would like to thank Mr. Stefan Schallmoser for carrying out some of the experiments. The funding from the Academy of Finland and the Network of Excellence IDECAT is gratefully acknowledged.