

Effect of the preparation technique of Cu-ZSM-5 catalysts on the isothermal oscillatory behavior of nitrous oxide decomposition

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Publication date

2020/4/1

Journal

Catalysis Today

Volume

345

Pages

59-70

Publisher

Elsevier

Description

A set of Cu-ZSM-5 samples ($\text{Si/Al} = 25$) was synthesized by wetness impregnation, aqueous phase ion exchange and solid-state ion exchange, SSIE. Copper(II) acetate was used as precursor during both wetness impregnation and aqueous phase ion exchange to prepare excessively-exchanged samples (*i.e.* $\text{Cu/Al} > 1$), whereas SSIE was carried out by sublimating copper(I) chloride. Additionally, a Cu-ZSM-5 sample with extremely low Al content ($\text{Si/Al} = 500$) was prepared by impregnation.

The samples were tested in the catalytic decomposition of N_2O , with the aim of studying possible effects of the preparation technique on the isothermal oscillatory behavior of the reaction rate in a series of tests carried out by varying both the temperature and the residence time. The SSIE sample led to a non-oscillating system, whereas the highest Cu content samples prepared by the two aqueous procedures exhibited clear ...