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Me-ZSM-5 MONOLITH FOAMS FOR THE NH_3-SCR OF NO

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Highlights

- Self-sustained zeolite monoliths by hydrothermal synthesis with polyurethane foam template
- Well crystallized ZSM-5 structures showing good mechanical resistance without binder
- Cu / Mn - ZSM-5 monolith foam catalysts tested for NH_3-SCR of NO
- High catalyst loading per unit volume and enhanced mass transfer characteristics

Abstract

Self-supported ZSM-5 zeolite monolith foams (ZMFs) with different Si/Al ratios have been successfully prepared by hydrothermal synthesis with a polyurethane foam (PUF) template followed by calcination in air at 550 °C to harden. Cu or Mn have been introduced on preformed ZMF samples to obtain monolithic catalysts that have been fully characterized by morphological (XRD and SEM), textural (BET and Pore size distribution), mechanical (compressive strength) and chemical (ICP-MS) analyses, and eventually tested in the Selective Catalytic Reduction of NO with NH_3 in the temperature range 100 – 450 °C. The zeolite monolith foams are characterized by a well crystallized ZSM-5 structure, a BET surface area ca. 420 m^2 g^{-1} and remarkable mechanical resistance even without any binder. Those structured catalysts show specific catalytic activity in line with powdered counterparts, but they can guarantee improved NO conversion due to the higher amount of catalyst

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