

# A Simple Approach of Tuning Catalytic Activity of MFI-Zeolites for Low-Temperature SCR of NO<sub>x</sub>

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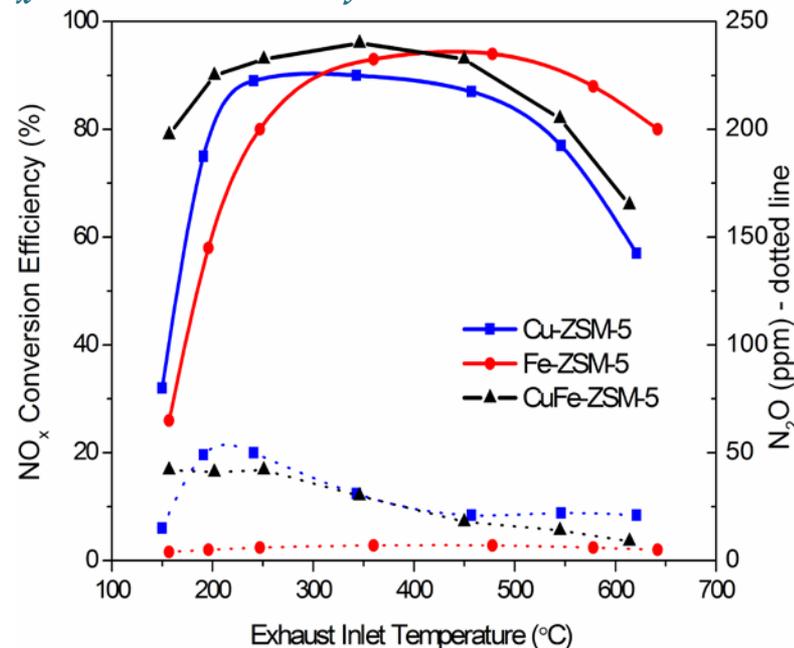
## Introduction

- Selective catalytic reduction (SCR) is the leading approach to meet the emerging EPA regulatory requirements (U.S. Tier 4 standards) for off-road diesel equipment by 2014.
- No suitable SCR catalyst provides a broad functioning temperature range (150-650 C), which is critical for off-road diesel engines.

## Results

- An extraordinarily simple but remarkably effective solution is developed for a new catalyst, CuFe-ZSM-5, obtained by solution exchange with Fe<sup>3+</sup> with Cu-ZSM-5.
- CuFe-ZSM-5 provides 80%+ NO<sub>x</sub> conversion efficiency with a temperature range of 150-550 C in the powder form.
- A rational development leads to the discovery of a series of SCR catalysts with Sc<sup>3+</sup>, In<sup>3+</sup>, and La<sup>3+</sup> with the same low temperature reactivity.

## NO<sub>x</sub> Reduction Performance



## Rational DFT Study

