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Confirmation of the Isomorphous Substitution by Sn Atoms in the Framework Positions of MFI-typed Zeolite

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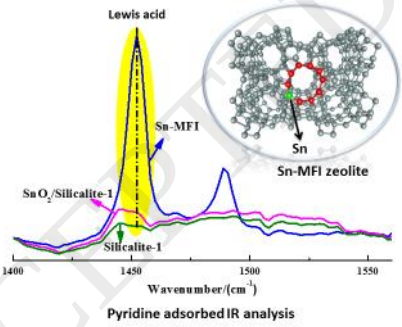
Highlights

- Unit cell expansion is caused by the incorporation of Sn atoms.
- Sn atoms are highly dispersed in the lattice of zeolite particles.
- Lewis acidity attributes to the charge difference between framework Sn and Si atoms.
- The catalytic performance of Sn-MFI is dependent on the Lewis acid property.

Graphical abstract



Abstract

Sn-MFI zeolite is one kind of remarkable emerging solid Lewis acid catalyst with high stability in recent years, due to its wide application in the environmental-friendly biomass conversion and catalytic oxidation processes. Herein, it is confirmed that the Sn species are highly dispersed in the matrix of zeolite, and the expansion of unit cell is attributed to the formation of crystalline Sn-O-Si bonds, owing to the size difference