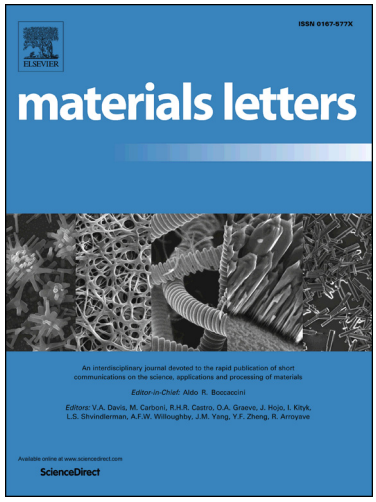

Reactive coating process for binder-free zeolite FAU films on metallic aluminum supports

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Reactive coating process for binder-free zeolite FAU films on metallic aluminum supports

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Highlights

- A novel approach for zeolite FAU films on metallic aluminum support
- Use of carboxylic acid as complexing agent in zeolite coating formation for the first time
- A highly pure and compact zeolite FAU as coating layer
- No costly post-synthesis step is required

Abstract

The chelating ability of carboxylic acids with Al^{3+} ions in an alkaline environment has been exploited to realize a direct zeolite FAU-type formation as coating layer onto metallic aluminum surface acting as a support. This reactive in-situ crystallization technique provides a general, facile and convenient approach to fabricate mechanically stable and inherently entangled zeolite@Aluminum composites. These special properties open attractive opportunities in the fields, where corrosion resistant and antimicrobial effects play a significant role as well as for applications involving effective heat transfer processes.

Keywords

Zeolites, Crystal growth, Interfaces, Coatings, Adhesion

Introduction

In recent years, there is a strong emphasis on the development of microporous zeolite coatings on various supports for important areas such as selective membranes [1], sensors [2] and structured catalytic reactors [3]. The Al-rich zeolites, in particularly FAU-type, are very promising due to large void volume, high