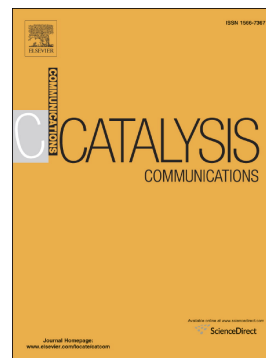


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High activity magnetic core-mesoporous shell sulfonic acid silica nanoparticles for carboxylic acid esterification

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ABSTRACT:

Magnetically-separable solid acid nanoparticle catalysts, comprising 80 nm Fe₃O₄ cores, a thin, dense silica inner shell and a mesoporous sulfonic acid silica outer shell, have been synthesized through a surfactant-templating and hydrothermal saline-promoted grafting protocol. These porous nanocomposites offer excellent activity towards propanoic acid esterification, in combination with facile recovery and re-use.

KEYWORDS: magnetic nanoparticles, core-shell, mesoporous, sulfonic silica, esterification

1. INTRODUCTION

Catalytic transformations require the combination of highly active materials with ease of separation and product recovery. Heterogeneous catalysts can offer a facile solution to separation via facile filtration/settling of micron-scale materials, but unfortunately suffer from poor reaction rates relative to homogeneous counterparts due to diffusion limitations. Diffusion-limited mass

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