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In-situ synthesis of Ni nanoparticles confined within SiO_2 networks with interparticle mesopores with enhanced selectivity for cinnamaldehyde hydrogenation

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Abstract

Ni nanoparticles (NPs) confined within SiO_2 networks with interparticle mesopores (Ni/SiO_2-IS) were successfully synthesized via *in-situ* process with a combination of azeotropic distillation and solvothermal methods. Ni/SiO_2-IS catalyst showed 65 % high selectivity to cinnamyl alcohol at total conversion (>99 %), which can be due to the confinement of Ni NPs in pores and were inaccessible to reactant molecules. It is expected that this simple and versatile method could be extended to cover many kinds of other selective catalytic reactions in the future.

Keywords: Ni; SiO_2; *In-situ* synthesis

1. Introduction

The selective hydrogenation of cinnamaldehyde (CMA) to cinnamyl alcohol (CMO) is highly desirable from an industrial point of view because it is an important reaction