



Zeolites and Related Materials: Trends, Targets and Challenges

1319

Proceedings of 4<sup>th</sup> International FEZA Conference

A. Gédéon, P. Massiani and F. Babonneau (Editors)

© 2008 Elsevier B.V. All rights reserved.

## Mesoporous silica containing sulfonic acid groups as catalysts for the alpha-pinene methoxylation

José E. Castanheiro<sup>a,b\*</sup>, Liliana Guerreiro<sup>a</sup>, Isabel M. Fonseca<sup>a</sup>, Ana M. Ramos<sup>a</sup>, Joaquim Vital<sup>a</sup>

<sup>a</sup>REQUIMTE, CQFB, Departamento de Química, FCT, Universidade Nova de Lisboa, 2829-516 Caparica, Portugal

<sup>b</sup>Centro de Química de Évora, Departamento de Química, Universidade de Évora, 7000-671 Évora, Portugal

\*Corresponding author. Tel.: +351 266745311; fax.: +351 266744971; E-mail address: jefc@uevora.pt

### Abstract

The methoxylation of  $\alpha$ -pinene was studied over sulfonic acid-functionalized mesoporous silica (MCM-41, PMO) at 60°C. The support functionalization was achieved by the introduction of 3-(mercaptopropyl)trimethoxysilane onto the surface of these materials either by grafting or by co-condensation. The thiol groups were oxidized to SO<sub>3</sub>H by treatment with H<sub>2</sub>O<sub>2</sub>. All the catalysts were active in the studied reaction being the PMO-SO<sub>3</sub>H-g the best one. Good values of selectivity to  $\alpha$ -terpinyl methyl ether were obtained with these catalysts. Catalytic stability of the PMO-SO<sub>3</sub>H-g was evaluated by performing consecutive batch runs with the same catalyst sample. After the third batch it was observed a stabilisation of the activity.

**Keywords:**  $\alpha$ -pinene; methoxylation, mesoporous silica; sulfonic acid groups.