



Methoxylation of α -pinene over heteropolyacids immobilized in silica

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ARTICLE INFO

Article history:

Received 17 May 2009

Received in revised form 3 November 2009

Accepted 4 November 2009

Available online 10 November 2009

Keywords:

Methoxylation

α -Pinene

Heteropolyacids

Silica

ABSTRACT

The methoxylation of α -pinene was studied using heteropolyacids immobilized on silica as catalysts, at 60 °C, being the α -terpinyl methyl ether the main product. Tungstophosphoric acid (PW), molybdophosphoric acid (PMo), tungstosilicic acid (SiW) and molybdosilicic acid (SiMo) were immobilized on silica by sol–gel method. It was observed that the catalytic activity of the silica-supported heteropolyacids decreases in the series: PW2_S > SiW_S > PMo_S > SiMo_S.

A series of PW immobilized on silica with different PW loading were prepared. It was observed that the catalytic activity increases with the amount of PW immobilized on silica. However, at high amount of PW on silica, a decrease of the catalytic activity was observed.

Good values of selectivity to α -terpinyl methyl ether (about 60% near complete conversion) were obtained with all catalysts.

Catalytic stability of the PW2_S was evaluated by performing consecutive batch runs with the same catalyst sample. After the third batch it was observed a stabilisation of the initial activity.

A kinetic model was developed assuming that the α -pinene is consumed according to the parallel reaction network. It was observed that the kinetic model fits the experimental concentration data quite well.

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