

عنوان مقاله:

Vapor phase esterification of acetic acid with n-butanol over H₃PO₄/MCM-41

محل انتشار:

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نویسندگان:

Roozbeh j.kalbasi - Department of Chemistry, Islamic Azad University, Shahreza Branch, Isfahan, Iran

Ahmadreza massah - Department of Chemistry, Islamic Azad University, Shahreza Branch, Isfahan, Iran

mehran ghiaci - Department of Chemistry, Isfahan University of Technology, Isfahan, Iran

خلاصه مقاله:

Several mesoporous aluminosilicate molecular sieves with the MCM-41 structure ($\text{SiO}_2/\text{Al}_2\text{O}_3 = 20\text{-}200$) have been synthesized using different aluminum sources and modifying several synthesis parameters during the preparation process, such as the temperature and the content of water and sulphuric acid in the gel mixture. All samples were characterized by element chemical analysis, X-ray diffraction, N₂ physisorption, thermal analyses and electron microscopy. These Al-MCM-41 materials have BET surface areas up to 1000 m²/g. The catalytic properties of their H₃PO₄-treated derivatives for esterification of acetic acid with nbutanol have been evaluated. This reaction preferentially gave n-butyl acetate. The conversion of acetic acid to n-butyl acetate increased with increasing the H₃PO₄ content in the catalysts and reached a maximum value for a H₃PO₄ loading of 20%, a further increase in H₃PO₄ leading to a decrease in the activity for esterification. The acidic properties and the pore network of the catalysts were key factors conditioning their catalytic performance. The effect of reaction temperature, H₃PO₄ content, feed ratio of acetic acid to nbutanol, WHSV and carrier gas flow rate was also investigated.

کلمات کلیدی:

mesoporous materials, MCM-41, esterification, vapor phase, acetic acid, phosphoric acid

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