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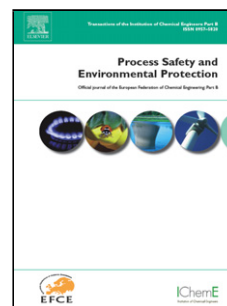
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**Stable and eco-friendly solid acids as alternative to sulfuric acid in the liquid
phase nitration of toluene**

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Abstract : Liquid-phase nitration of toluene was carried out using a silica supported Cs salt of phosphomolybdic acid ($\text{Cs}_{2.5}\text{H}_{0.5}\text{PMoO}_{40}$) as catalyst with dilute nitric acid under mild conditions. The $\text{Cs}_{2.5}\text{H}_{0.5}\text{PMoO}_{40}$ particles with Keggin type structure were well dispersed on the surface of silica, and the catalysts exhibited strong acidity, which may be responsible for the high catalytic nitration activity. The effects of various parameters on nitration were tested, which included reaction temperature, reaction time, catalyst amount and reactants ratio. Under suitable conditions, the nitrations gave high toluene conversion (99.6%) and good mono nitration selectivity. Compared to the conventional process, there was no other organic solvent or sulfuric acid used in the reaction system, which made it more environment-friendly. Moreover, the supported catalyst was proven to have excellent stability in the nitration process.

Key words: Liquid-phase nitration; Toluene; Solid acid; Catalysis; Supported

1. Introduction

Aromatics nitration reaction is one of the more widely used in organic syntheses and

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