



Iron oxide-pillared clay catalyst for oxidation of benzyl alcohol

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Iron oxide-pillared bentonite (Fe-PILC) was synthesized by the intercalation of iron (III) chloride into clay interlayers and calcination at 300°C for 5 h. The synthesized clay and raw clay were characterized using powder X-ray diffraction and N₂ adsorption-desorption. From the characterization, XRD pattern exhibited the characteristic peaks of montmorillonite at 2θ of 7° and 22°. Additionally, the N₂ adsorption-desorption isotherm indicated mesoporous structure and BET specific surface area was 113 m²/g. The synthesized catalyst was exploited for the oxidation of benzyl alcohol, comparing with raw clays. Benzaldehyde was prepared conveniently and efficiently via the oxidation of benzyl alcohol with hydrogen peroxide. The high yield of benzaldehyde was obtained using 30 wt% Fe-PILC to benzyl alcohol in refluxing acetonitrile over 3 h. This method was carried out successfully furnishing the desired product in high yields and 100% selectivity under mild reaction conditions.

Keywords: Iron oxide-pillared clay; Benzaldehyde; Benzyl alcohol