

Synthesis of amine-grafted layered double hydroxides and zirconium hydroxide and their applications for transesterification

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The Mg-Al layered double hydroxides (LDHs) and Zirconium hydroxide grafted with aminopropyl-groups, 3-guanidinylpropyl-groups and 2-formylimidazolylpropyl-groups were prepared and used as the base catalysts for transesterification. LDHs intercalated with carbonate and SDS (dodecyl sulfate) were prepared by co-precipitation method, and the effect of interlayer anions on the grafting of amino-groups was examined. The amine-grafted materials were characterized by X-ray diffraction (XRD), nitrogen sorption isotherms, and thermo-gravimetric analysis (TGA). The catalytic activities of amine-grafted LDHs were compared with the pristine LDHs in base-catalyzed transesterification. Transesterification was performed at reflux temperature, using a fixed methanol to triacetin mole ratio of 6:1 and catalyst of 3 wt% (based on the quantity of triacetin used).

Keywords: Transesterification, layered double hydroxides, heterogeneous catalysts

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