Amberlite-Supported L-Prolinate: A Novel Heterogeneous Organocatalyst for the Three-Component Synthesis of 4*H*-Pyrano[2,3-*c*]pyrazole Derivatives[1]

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Abstract—This report describes a new and convenient procedure for heterogenization of L-proline organocatalyst, which is based on non-covalent immobilization of L-proline on the surface of anion-exchange resin amberlite IRA900OH (AmbIRA900OH) as an efficient, cheap, and commercially accessible cationic polymer support. The ion-pair immobilization of L-proline on the surface of amberlite IRA900OH was achieved by treatment of a MeOH/H_2O solution of L-proline with amberlite IRA900OH at 60°C. L-Proline anion was exchanged with hydroxide ion and immobilized via ionic interaction between the carboxylate group of L-prolinate and quaternary ammonium cation of the cationic amberlite support. The prepared heterogeneous organocatalyst was characterized by FTIR, TGA, DTG, XRD, and elemental analysis techniques. The amberlite-supported catalyst was used as an efficient, reusable, and cheap catalyst for the one-pot three-component synthesis of 4*H*-pyrano[2,3-c]pyrazole derivatives in ethanol. The catalyst can be easily recovered and reused by simple filtration for several successive runs with no significant loss of catalytic activity.

Keywords: L-proline, anion-exchange resin, organocatalyst, 4*H*-pyrano[2,3-*c*]pyrazole, heterogeneous catalyst

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