Direct Amide Condensation by Using Supported Boronates

Significance: Polystyrene resin bound quaternary ammonium boronates 1a–c were prepared by treatment of a commercial anion-exchange resin with the appropriate arylboronic acids (eq. 1). Boronates 1a–c catalyzed the dehydrative condensation of carboxylic acids with amines under azeotropic reflux conditions to give the corresponding amides quantitatively (eq. 2).

Comment: In the dehydrative condensation of 3-phenylpropanoic acid with benzylamine, catalyst 1b was recovered by decantation and reused nine times without loss of its catalytic activity. 1H NMR spectroscopy studies suggested that free arylboronic acids were released from the resin into the solution during the reaction.