

Efficient atom-economical solvent-free one-pot multicomponent synthesis of 2-amino-4*H*-benzo[*b*]pyrans catalyzed by solid base SiO₂-OK as a reusable catalyst

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Abstract An efficient one-pot, atom-economical, three-component reaction of aromatic aldehydes, dimedone, and malononitrile was developed, for the first time, using SiO₂-OK as an efficient solid base reusable catalyst, producing various substituted 2-amino-4*H*-benzo[*b*]pyran derivatives in good to excellent yields, under solvent-free conditions at 80 °C. This synthesis was confirmed to follow the group–assistant–purification chemistry process, which can avoid traditional chromatography and recrystallization purifications. The catalyst is inexpensive and easily obtained, stable and storable, and easily recycled, being reused at least six times without any marked change in its catalytic activity.

Keywords Multicomponent reaction · Solvent-free synthesis · Group–assistant–purification chemistry · Tetrahydrobenzo[*b*]pyrans

Introduction

Development of environmentally benign, efficient, and economical methods for synthesis of biologically interesting compounds remains a significant challenge in synthetic chemistry. The chemical industry is one of the major contributors to environmental pollution, owing to the use of hazardous chemicals, in particular large amounts of flammable, volatile, and often toxic organic solvents. Green chemistry emphasizes the need for environmentally clean synthesis, which involves

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