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Sustainable alternative protocols for the multicomponent synthesis of spiro-4H-pyrans catalyzed by 4-dimethylaminopyridine

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Abstract

Green approaches to the synthesis of spiro-4. H-pyrans are reported based on the one-pot and three-component condensation via a domino Knoevenagel /Michael /cyclization sequence. These approaches involve evaluation of the activity of several organocatalysts in water as a reaction media and also under solvent-free in both microwave irradiation and ball milling conditions. Extensive experiments were carried out to optimize the reaction parameters including type and amount of catalyst, reaction temperature and time. Microwave irradiation in presence of 4-dimethylaminopyridine (DMAP) was observed as the best procedure with good yields, short reaction time, environmental friendliness, and convenient operation.

Keywords

4-Dimethylaminopyridine, Ball milling, Green chemistry, Microwave irradiation, Spiro-4H-pyrans, Catalysts, Irradiation, Milling (machining), Environmental friendliness, Multicomponent synthesis, Reaction parameters, Reaction temperature, Short reaction time, Synthesis (chemical)