Vali-e-Asr University of Rafsanjan

19th Iranian Seminar on Organic Chemistry
Vali-e-Asr University of Rafsanjan, 5 -7 Sep. 2012

Starch supported $HClO_4$: a mild and efficient recyclable catalyst for one-pot synthesis of polyhydroquinoline *via* the Hantzsch reaction under solvent-free conditions

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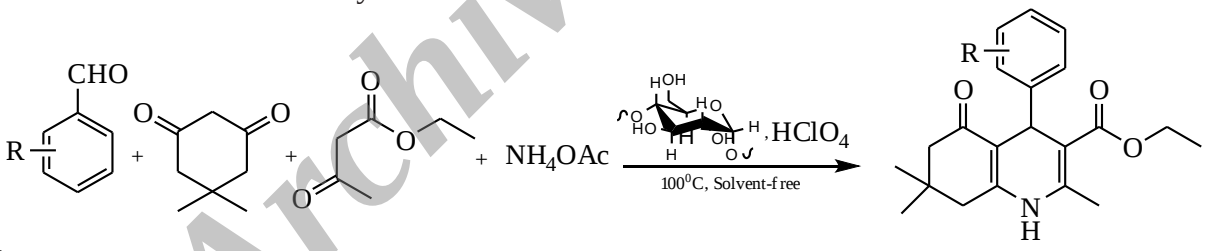
In recent years, an increasing interest has been focused on the synthesis of 1,4-dihydropyridyl compounds owing to their significant biological activity [1]. Generally, the basic skeleton of DHP was first discovered by Hantzsch in 1882 and this classical method involves the three-component coupling of an aldehyde with ethyl acetoacetate and ammonia in acetic acid or in refluxing alcohol [2]. Numerous methods have been reported [3] for the synthesis of polyhydroquinoline derivatives, because of the biological importance associated with 1,4-DHP ring and polyhydroquinoline derivatives. However, these methods suffer from drawbacks such as a long reaction time, an excess of organic solvent, lower product yields, and harsh refluxing conditions.

In recent years, the direction of science and technology has been shifting more towards eco-friendly, natural product resources and reusable catalysts. Thus, natural biopolymers are attractive candidates in the search for such solid support catalysts [4].

The present study describes a convenient and efficient process for the synthesis of polyhydroquinoline derivatives through a four-component coupling of various aromatic aldehydes, 5,5-dimethyl-1,3-cyclohexanedione, ethyl acetoacetate, and ammonium acetate

in a solvent-free media at 100°C using starch supported $HClO_4$ (starch/$HClO_4$) as a heterogeneous catalyst. The catalyst is highly active, stable, and could be reused several times without much loss of its activity.



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