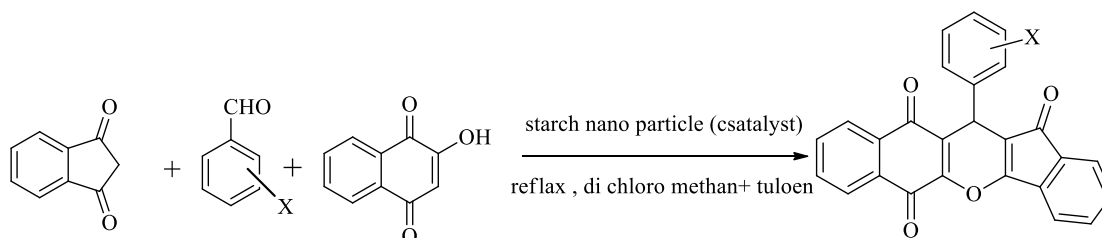


Abstract

Synthesis of naphthopyran is important because of its extensive biological and therapeutic properties such as anti-bacterial, anti-viral and anti-inflammatory. Taking in to account the importance and the principles of green chemistry the use of solfonating starch nano particle as a new catalyst, non-toxic and effective for compression benzaldehyde derivatives, 2-hydroxynaphtalene-1,4-dione and indene-1,3-dione has been used.

One-pot quantitative procedure for the preparation of functionalized 12-arylbenzo[g]indeno[1,2-b]chromene-6,11,13(12H)-trione Derivatives in the presence of solfonating starch nano particle under reflux conditions:



The advantages of this approach are: The use of available, cheap and non-toxic catalyst, high efficiency, the short of time reaction with less pollution.

Key Words: Naphthopyrans, Green Chemistry, Green Catalyst, Starch Nanoparticles, Nanocatalyst, Multi-component reactions



University of Zabol
Graduate School
Faculty of Sciences

Department of Chemistry

**The Thesis Submitted for the Degree of M.Sc (in the field of
Organic Chemistry)**

**An efficient one-pot three-component and green
synthesis of heterocyclic naphthopyran derivatives
using natural nanocatalysts**

Supervisors

Dr. A. Moradi

Advisers

Dr. Z. Soori nazami

Mis. A. Heidari

By

Z. Malaii

September 2017