

Succinic Acid As a Green and Bio-Based Catalyst assisted solvent-free one-pot Biginelli synthesis of biologically active 3,4-dihydropyrimidin-2-(1H)-ones/thiones derivatives

Farzaneh Mohamadpour^{1*} and Mansoor Feilizadeh²

¹Young Researchers and Elite Club, Shiraz Branch, Islamic Azad University, Shiraz, Iran

²Department of Chemical Engineering, Faculty of Engineering, Ferdowsi University of Mashhad, Mashhad, Iran

*Corresponding author. E-mail: mohamadpour.f.7@gmail.com

<https://doi.org/10.12982/CMUJNS.2019.0034>

Received: February 21, 2019

Revised: April 4, 2019

Accepted: April 24, 2019

ABSTRACT

Succinic acid as a bio-based green and versatile catalyst has been employed for one-pot facile three-component Biginelli synthesis of 3,4-dihydropyrimidin-2-(1H)-ones/thiones derivatives under solvent-free conditions with high to excellent yields and short reaction times. This sustainable procedure has notable benefits such as easy-to-handle, green, low-cost and non-toxic catalyst, materials available, simple work-up with no necessity of chromatographic purification steps, one-pot and solvent-free conditions. The products have been characterized by melting points and ¹H NMR spectroscopy.

Keywords: Succinic acid, 3,4-dihydropyrimidin-2-(1H)-ones/thiones derivatives, Sustainable procedure, Biginelli condensation reaction, Solvent-free conditions.

INTRODUCTION

Succinic acid (C₄-dicarboxylic acid) (Figure 1) is a common metabolite in plants, animals and microorganisms and has been used widely in agricultural, food and pharmaceutical industries (Zeikus et al., 1999). This acid has holds good industrial applications and is used in industries such as, resins, polymer, paints, cosmetics and inks, etc (Vermuri et al., 2002). To date, the economically renewable resources used in succinic acid production reported are cheese whey