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Kinetic Study of the Pyridine-Catalyzed Selenolactonization of 4-Pentenoic Acid

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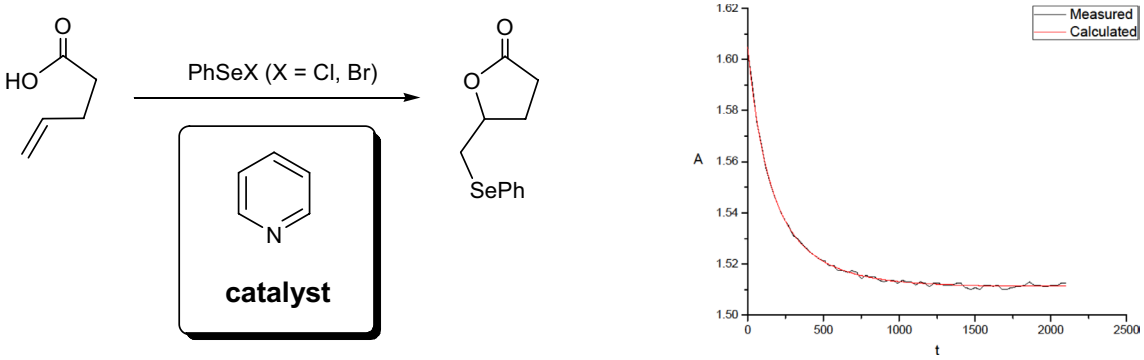
Abstract

The kinetics and mechanism of the pyridine-catalyzed cyclofunctionalization of 4-pentenoic acid by means of PhSeX (X = Cl, Br) have been investigated spectrophotometrically, under *pseudo*-first order reaction conditions. The influence of the reaction temperature, the type of cyclization reagent and used catalyst on the reaction rate and mechanism was examined. The obtained data have showed that rate constants go on increasing as the temperatures go up and with use of PhSeCl as reagent. Also, the reaction rate is directly depended on the type of the catalyst used—stronger bases with higher tendency for hydrogen bond formation (DN) are promoting reaction in more efficient way.

Graphic Abstract



Keywords Kinetics · Lactone · Pyridine · Selenium

1 Introduction

Gama lactones present a unique class of organic compounds due to their presence as key structural units in numerous biologically active molecules, as well as due to their potential to serve as building blocks for the total synthesis of natural products [1]. The gamma-lactone motif has been present in more than one third of natural products. Moreover, its presence in the core of the fungal, marine or bacterial sourced-biomolecules is distinctive for the wide range of expressed biological activities [2–4]. Therefore, modern science is setting an imperative in front of organic chemists for development of new and improvement of existing methodologies for the selective synthesis of gamma lactone

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