Full Paper

An efficient solvent-free synthesis of *meso-*substituted dipyrromethanes using SnCl$_2$·2H$_2$O catalysis

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ABSTRACT: *Highly rapid and simple methodology has been developed for the quantitative synthesis of meso-substituted dipyrromethanes from lowest pyrrole/aldehyde ratio. The method was carried out by using SnCl$_2$·2H$_2$O as a catalyst under solvent free condition. The method is environmentally friendly, easy to workup, and gives excellent yield of the products.*

Keywords: *pyrrole; dipyrromethanes; SnCl$_2$·2H$_2$O catalysis; grinding*

Introduction

Dipyrromethanes are important building blocks for the synthesis of porphyrins [1], Calixpyrrols [2], and Corroles [3]. Dipyrromethanes are compounds known for more than a century [4]. In the past decades, a variety of conditions have been established for the synthesis of dipyrromethanes in the presence of various catalysts such as p-toluenesulfonic acid [5], TiCl$_4$ [6], CF$_3$COOH [7] and pyrrolidinium tetrafluoroborate [8]. In the synthesis of dipyrromethanes most of the conditions are based on the acid catalyzed condensation of pyrrole with aldehyde. Recently, several methods have been developed, for the synthesis of dipyrromethanes in various catalyst such as ionic liquid [Hmim] BF$_4$ [9], HCl/water [10], cation exchange resin [11], metal triflate catalysis [12], HCl [13], iodine/CH$_2$Cl$_2$ [14] and InCl$_3$ [15]. However, all of the synthetic protocols

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