



# A Novel Method for the Synthesis of Dipyrromethanes Under Solvent-Free Condition

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**Abstract:** This study describes a successful approach for the synthesis of dipyrromethanes using iodine as a catalyst on grinding. This protocol does not require any solvent and carried out at lowest pyrrole/aldehyde ratio which makes this method economically and environmentally attractive. This protocol affords the products immediately with excellent yield.

**Keywords:** Pyrrole, Ketone, Dipyrromethanes, Iodine, Solvent free.

## Introduction

As we know, green chemistry is defined as the design of chemical products and processes that reduce or eliminate the use and generation of hazardous substances. For the purposes of this definition, synthetic chemists have great interest in developing highly efficient transformations for the preparation of organic compounds. One of the main themes of contemporary synthetic organic chemistry is the use of environmentally feasible reagents particularly in solvent-free conditions and environmentally benign catalytic systems, which are also required to be efficient and economic. Solvent-free organic reactions are usually rapid, eco-friendly, high yielding, and economically viable. In this context, organic reactions under solvent-free conditions at room temperature have been achieved.

Dipyrromethanes are compounds known for more than a century and are widely being used as important building blocks for the synthesis of porphyrins<sup>1</sup>, Calixpyrrols<sup>2</sup> and Corroles<sup>3</sup>. Which have recent applications as chiral catalysts, chiral sensors, synthetic receptors for small molecular devices, potential sensitizers for photodynamic cancer therapy<sup>4-6</sup>. 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<sup>7,8</sup>, TiCl<sub>4</sub><sup>9</sup>, CF<sub>3</sub>COOH<sup>10-12</sup>, pyrrolidinium tetrafluoroborate<sup>13</sup>. Recently, several methods have been developed, for the synthesis of dipyrromethanes in various catalysts such as ionic liquid