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Sengodagounder Muthusamy, Singaravelan Ganesh Kumar



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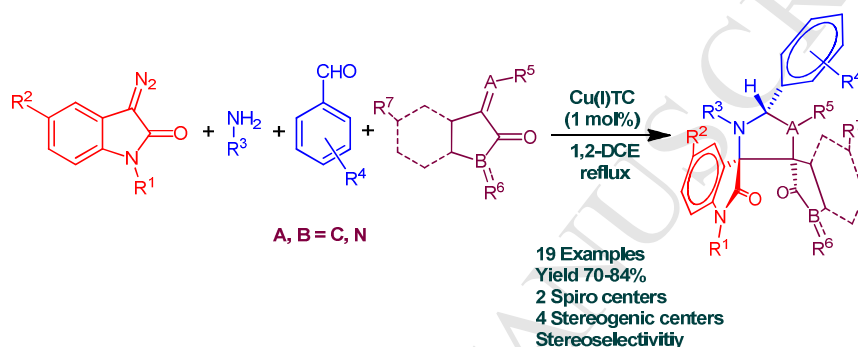
Sengodagounder Muthusamy,\* Singaravelan Ganesh Kumar

School of Chemistry, Bharathidasan University, Tiruchirappalli - 620 024, India

\*Corresponding author. Tel.: +91-431-2407053; fax: +91-431-2407045;

e-mail: [muthu@bdu.ac.in](mailto:muthu@bdu.ac.in)

### Graphical Abstract



### Abstract

The four component reactions involving diazoamides, amines, aldehydes, exomethylenes / imines were performed in the presence of copper(I) thiophenecarboxylate as a catalyst to afford dispiroindolo-pyrrolidine / -imidazolidine derivatives in good yield with regio-, chemo- and diastereoselective manner. The structure and stereochemistry of dispiroheterocyclic ring systems were confirmed based on the representative single-crystal X-ray analysis. These reactions involve the generation of intermolecular azomethine ylide intermediates and the subsequent 1,3-dipolar cycloaddition process with olefins or imines.

**Keywords:** azomethine ylide, copper(I) catalyst, diazoamide, dispiro compound, stereoselectivity

### 1. Introduction

Spiroheterocycles have attracted a great deal of interest because of their frequent occurrence in natural products and their significant biological activities.<sup>1</sup> In particular, spiroindoloheterocyclic skeletons are found in a large family of synthetic compounds exhibiting multifaceted bioactivities,<sup>2</sup> such as antimycobacterial, antitumor, antimicrobial, antibacterial, antifungal and

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