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Enantioselective Addition of 1,3-Dicarbonyl Compounds to N-Alkoxycarbonyl Ketimines Derived from Isatins & Construction of Spirocyclic Oxindoles

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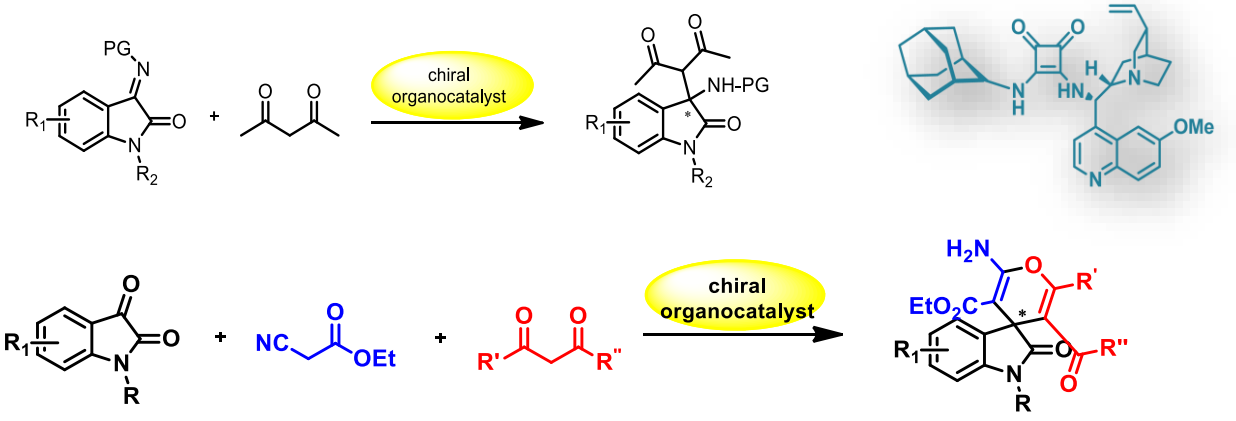
Abstract: Indoline-2,3-dione, commonly known as isatin, is a well-known natural product and has excellent potential to be used as an electrophile and nucleophile, making them valuable building blocks in organic synthesis. They are recognized as core structures in various bioactive molecules and pharmaceutical compounds, and the highly reactive C-3 carbonyl group of isatins makes them more applicable in organic synthesis. The reactions of the C-3 carbonyl group of isatins are mostly by nucleophilic additions and spiroannulation, resulting in the formation of C-3 substituted oxindoles. Specifically, 3- aminooxindole and heterocyclic spiro oxindole moiety have been encountered as the core structure of many architecturally complex natural products due to their highly pronounced pharmaceutical activities. In this thesis study, in the first part, we aimed to synthesize C-3 substituted aminooxindoles by Mannich reaction of *N*-alkoxy carbonyl ketimines and acetylacetone in the presence of chiral Quinine-based bifunctional organocatalysts developed in our research group with high enantioselectivity. From this methodology, in the second part of this thesis, we aimed to construct a stereoselective spirocyclic oxindole moiety at the C-3 position by Knoevenagel Condensation and then Michael Addition/Cyclization reaction of isatins with ethyl cyanoacetate and 1,3-dicarbonyl compounds in the presence of chiral bifunctional organocatalysts.



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