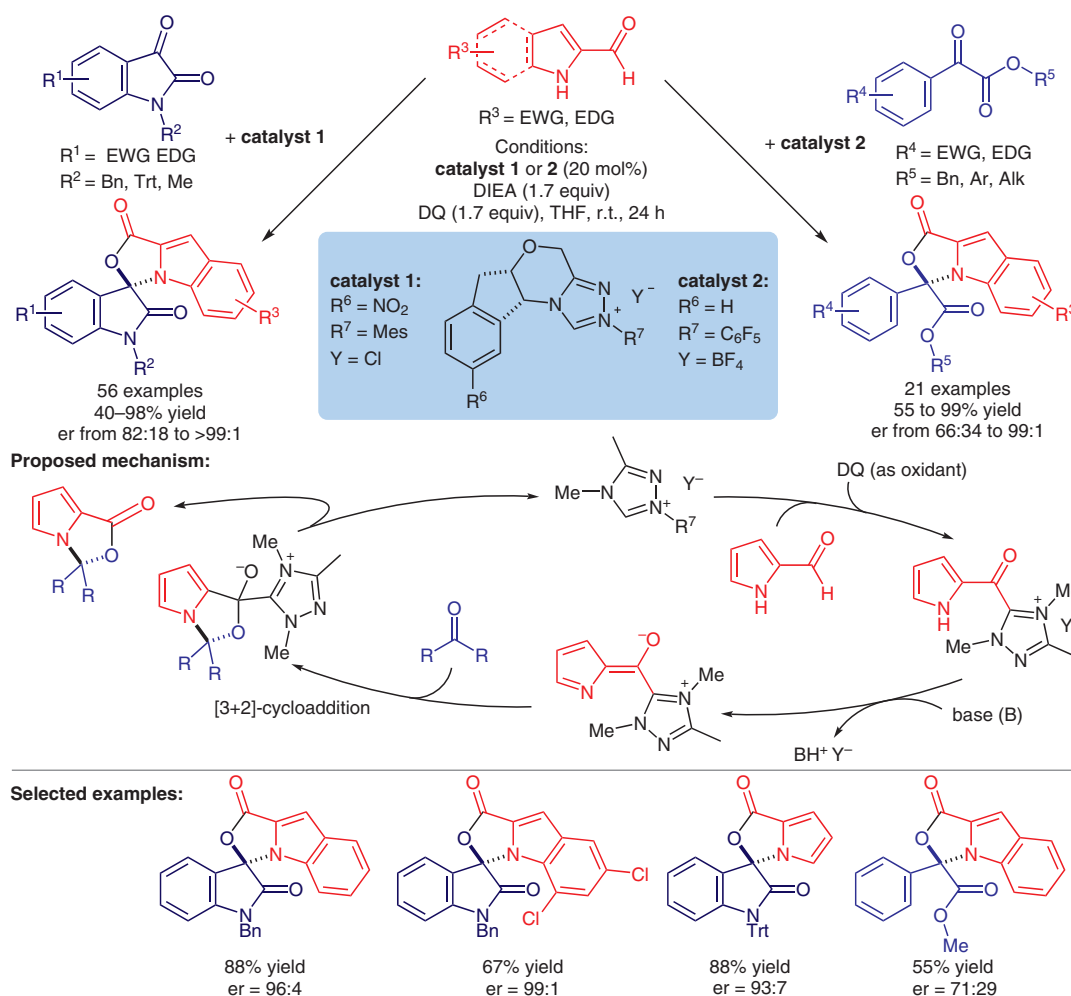


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Carbene-Catalyzed Enantioselective Aromatic N-Nucleophilic Addition of Heteroarenes to Ketones
Angew. Chem. Int. Ed. **2019**, DOI: 10.1002/anie.201912160.

NHC-Catalyzed *N,O*-Acetal Formation from Heteroarenes and Ketones



Significance: Jin and co-workers report the NHC-catalyzed formation of *N,O*-acetals by the nucleophilic addition of heteroarenes to highly electrophilic ketones, such as isatins or α -keto esters. They propose an oxidation of NHC adduct followed by proton abstraction and [3+2] cycloaddition with the ketone as a possible mechanism. They obtain heteroatom-functionalized spirocyclic products in moderate to excellent yields and enantioselectivities. Different classes of ketones used in this transformation require slightly modified catalysts.

Comment: The authors provide a conceptually new approach to acetals that includes an oxidation of the NHC adduct. A group of substituted NHC catalysts can handle a wide range of different substituted isatins and α -keto esters to furnish the products in excellent yields and high enantioselectivities. Because the antibacterial activities of pyrrole-based products have been shown to be the best of this series of cyclic products, further investigations would be appreciated.

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 Synfacts 2020, 16(01), 0082 Published online: 13.12.2019
 DOI: 10.1055/s-0039-1691343; Reg-No.: B11719SF

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