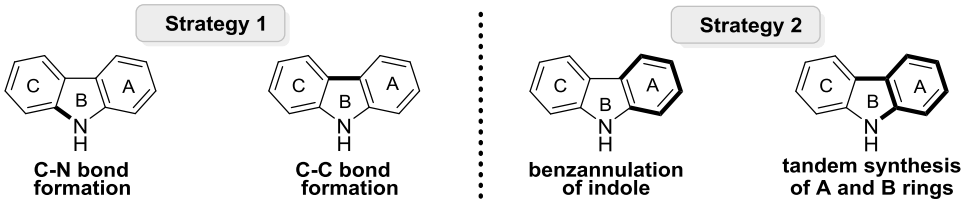
Brønsted Acid Catalyzed One-Pot Cascade Benzannulation of Indole for the Expeditious Synthesis of Carbazole: A Journey towards Carbazole Alkaloids

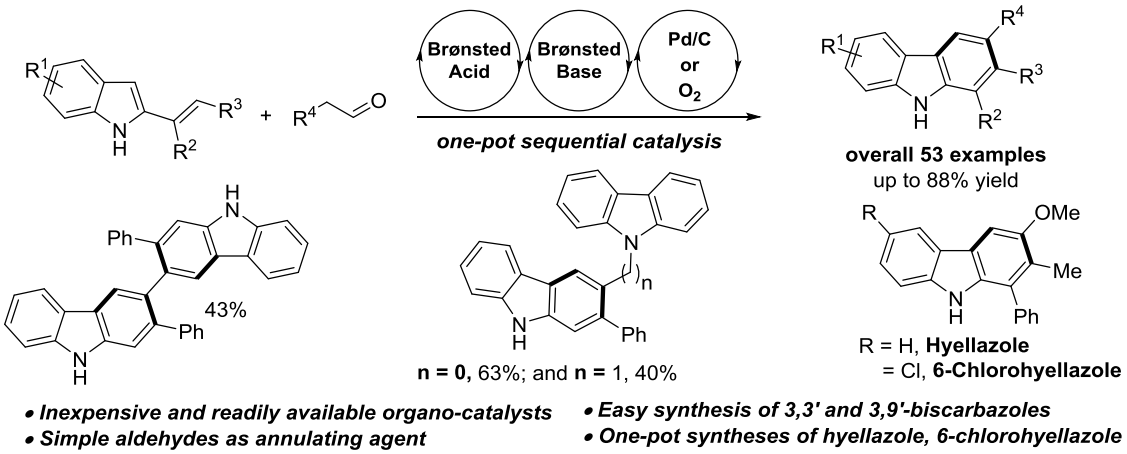
Key Words: (1) Indole (2) Carbazole (3) Benzannulation (4) One-pot cascade reaction (5) Brønsted acid catalysis (6) Carbazole alkaloids

The thesis entitled **"Brønsted Acid Catalyzed One-Pot Cascade Benzannulation of Indole for the Expeditious Synthesis of Carbazole: A Journey towards Carbazole Alkaloids"** describes the strategies for the synthesis of diversely functionalized carbazole frameworks with different substitution patterns and its applications for the syntheses of various classes of carbazole alkaloids.



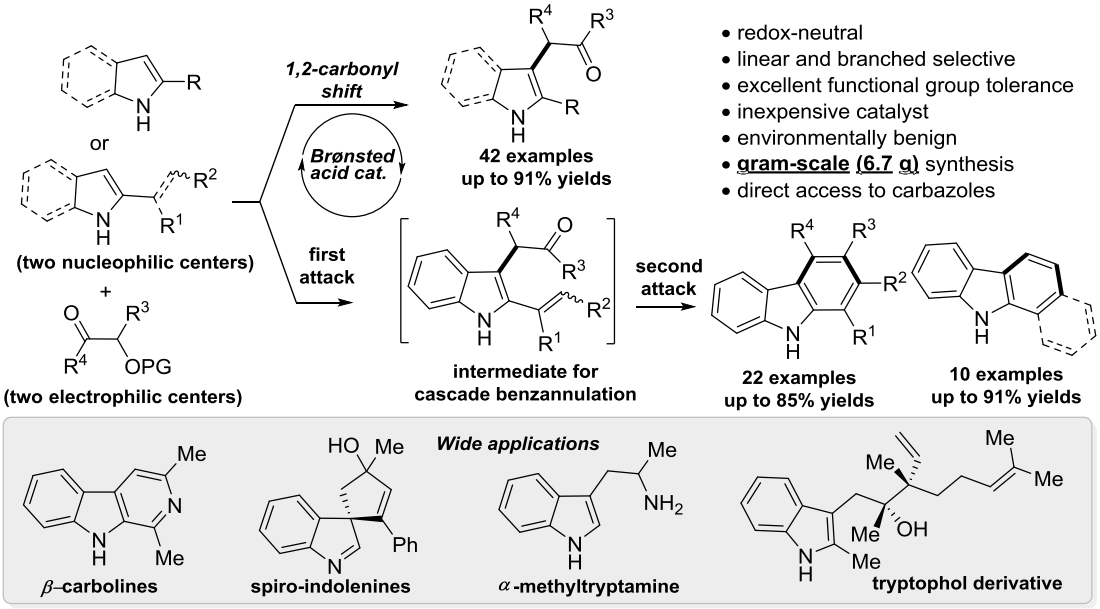
Scheme 1: Strategies to construct carbazole framework.

Chapter 1 describes the importance of carbazole backbone and the last one decade literature overview on the generation of this important core by employing different modes of benzannulation approaches (*Scheme 1*).



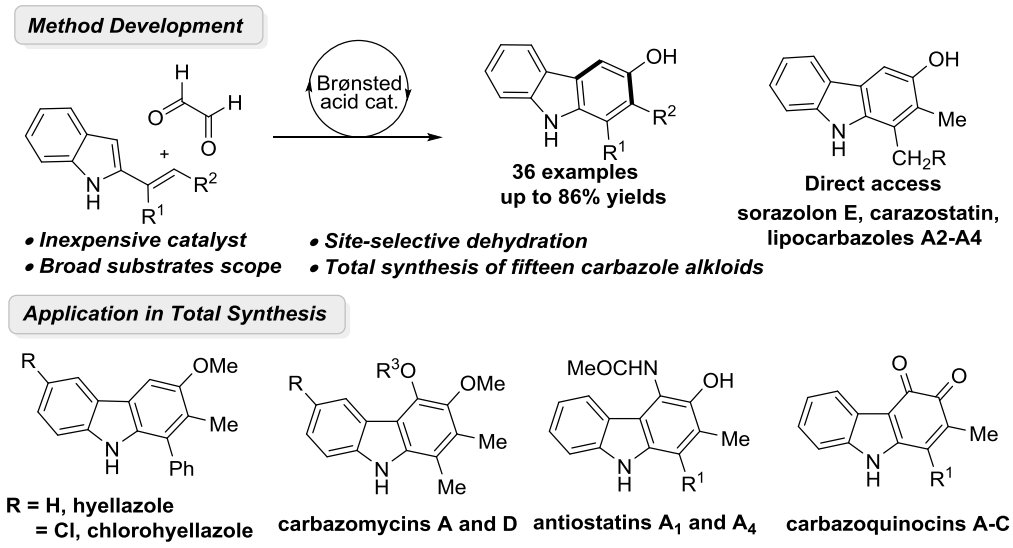
Scheme 2: Benzannulation of 2-alkenyl indoles by one-pot sequential relay catalysis.

Chapter 2 demonstrates the benzannulation of 2-alkenyl indoles using aldehydes by sequential triple relay catalysis and its applications to construct carbazole alkaloids. A modified route was also accomplished by using molecular O_2 as sole oxidant. (*Scheme 2*).



Scheme 3: Brønsted acid catalyzed one-pot cascade benzannulation reaction.

Chapter 3 describes a Brønsted acid catalyzed cascade reaction for the conversion of indoles to *α*-(3-indolyl) and *α*-(3-pyrrolyl) ketone by using several *α*-benzyloxy aldehydes as coupling partners and its applications to construct functionalized carbazoles and benzo[*a*]carbazoles by employing a cascade annulation strategy (*Scheme 3*).



Scheme 4: Total syntheses of fifteen 3-hydroxy-2-methyl carbazole based alkaloids.

Chapter 4 describes a state-of-art one-pot cascade benzannulation technique for the synthesis of valuable 3-hydroxy-2-methyl carbazoles and its utility for the concise syntheses of antiostatins, lipocarbazoles, and related fifteen alkaloids (*Scheme 4*).