**Sequential Brønsted Acid/Base Catalyzed Domino C3-Alkenylation of Indoles and Pyrroles: A One-Pot Access to Carbazoles and Carbazole Alkaloids**

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*β*-Alkyl 3-vinylindoles are important structural motif in organic synthesis considering their diverse application as synthetic intermediates, and their presence in various anti-cancer, anti-bacterial, and anti-viral agents.1 In addition, they are highly important starting precursors for the synthesis of many important biologically relevant molecules such as indole alkaloids, carbolines, and carbazoles.2 Among them, carbazole in particular, is a privileged structural motif considering its diverse applications in medicinal, material, and polymer chemistry. Considering their broad applicability, efficient synthesis of 3-alkenylindoles and carbazoles are highly desirable.



In this context, we have developed a transition-metal-free, one-pot alkenylation of unprotected indole using aldehyde as an alkenylating agent.3 Several functionalized *β*-alkyl 3-vinylindoles and conjugated-1,3-dienes are synthesized in moderate to excellent yields with exclusive (*E*)-selectivity. Recycling of benzenesulfinic acid up to five successive alkenylation reaction renders this method economically viable. This powerful strategy is extrapolated to the synthesis of highly functionalized carbazoles using one-pot sequential-triple-relay catalysis via benzannulation of 2-alkenyl indoles.4 Finally, this methodology is applied to the synthesis of natural products hyellazole and 6-chlorohyellazole from the appropriate 2-alkenyl indoles. Advanced intermediates for the synthesis of alkaloids carazostatin, antiostatin A4, antiostatin B2, antiostatin B4, carbazoquinocin C, carbazomycin A, and carbazomycin B have also been achieved via step economical way.

**References:**

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