Vinyldiazo Compounds and Their Amazing Transformations

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Abstract

Vinyldiazo compounds are versatile precursors of highly reactive metallo-vinylcarbenes, vinylcarbenes, cyclopropenes, and vinyldiazonium ions, and this presentation will describe their myriad uses. The previously limited methods available for their preparation restricted structural diversity in their reactions. We have discovered new methodologies for the preparation of diverse vinyldiazo compounds and will report their effective uses in metal carbene transformations, photolytic processes, and Brønsted acid catalyzed reactions. These include highly enantiocontrolled cyclopropanation, N-H insertion, O-H insertion, and [3+*n*]-cycloaddition reactions, photolytic methods for the synthesis of heterocyclic products, and electrophilic reactions resulting in new diazo compounds. The development of multifunctional diazo compounds and their diverse reactions makes possible synthetic strategies previously thought to be impossible. This presentation will also outline possible new directions and unsolved problems.