



Naresh Murty Venneti

Wayne State University
USA

New generation Triarylbismuth reagents for Green Cross-Coupling Reactions: Synthesis of biologically active Benzofurans and Tetrasubstituted Functionalized Alkenes

Abstract:

Triarylbismuth organometallic reagents represent a new generation of green, 3-fold coupling agents that have shown great promise in C-C bond formation under palladium-catalyzed conditions. These reagents are particularly atom-economic, capable of transferring all three aryl groups to corresponding electrophilic partners in a single step, which makes them highly efficient and sustainable for synthetic applications. We present the application of triarylbismuths in the synthesis of biologically important 2-arylbenzofuran-based natural products. A key transformation involves a domino cyclization/coupling or coupling/cyclization reaction using substituted 2-(2,2dibromovinyl)phenols in combination with triarylbismuths under Pd-catalyzed conditions. This approach has been successfully applied to the synthesis of 17 biologically relevant benzofuran natural products, demonstrating the method's versatility and efficiency. Additionally, we report the bis-coupling reactivity of 1,1-dibromo esters under Pd-catalyzed conditions using triarylbismuth reagents, further expanding the utility of this reagent class. This established method was utilized in the step-economic convergent synthesis of Quebecol natural product.

Biography

Naresh Murty Venneti earned my Ph.D. in organic synthesis from IIT Kanpur in 2018, where I developed Pd-catalyzed methodologies for C-C bond formations using triarylbismuth reagents. After moving to the USA, I joined Wayne State University as a postdoctoral fellow, specializing in solid-phase peptide synthesis and alkaloid natural products. I advanced to Senior Research Scientist and Lab Manager, leading peptide-based projects like photodesulfurization and on-resin disulfide formation. Since August 2023, I have served as Project Manager on an NIEHS-funded grant, focused on macrocyclic peptides and unnatural amino acid synthesis, while mentoring students and contributing as a peer reviewer.