Brønsted Acid Catalysis - Concepts and Applications in the Synthesis of Heterocycles

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The development and application of metal-free catalysts has become an important topic in organic synthesis and catalysis. Recently, chiral Brønsted acids have been shown to be vital alternatives to metal catalysts and examples of highly enantioselective transformations have been reported. These reactions, similar to several enzymatic processes, proceed through ion-pair and hydrogen-bond activation. In this presentation our introduction to enantioselective Brønsted acid catalysis will be shown and new and valuable transformations will be highlighted. Additionally, efforts to delineate the general requirements for performing Brønsted acid as well as synergistic catalysis with the use of visible light or metals will be outlined and the applicability of these catalytic processes to the synthesis of natural product cores and heterocycles will be presented.