The Baylis-Hillman reaction: Our vision and experience

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Abstract Speech

To meet the demands of emerging trends, the present day organic chemistry emphasizes the need for discovering new reactions or strategies for construction of carbon-carbon bonds mainly involving the concepts of atom–economy, organo-catalysis, and easy generation of useful molecules containing proximal functional groups for assembling the required carbon frameworks. The Baylis-Hillman (also known as the Morita-Baylis-Hillman) reaction is one such organocatalytic atom-economy reaction developed in recent years, for the construction of carbon-carbon bonds leading to the production of diverse classes of molecules having several functional groups in close proximity. It is a three component atom–economy carbon-carbon bond forming reaction between the α-position of activated alkenes and electrophiles under the influence of a catalyst (most commonly an organic catalyst).[1-8] These multi-functional molecules, which are usually known as Baylis-Hillman (BH) adducts, showed enormous utility in many directions of synthetic and mechanistic chemistry, clearly demonstrating the power of proximity of the functional groups in molecules.[1-8]

We have been systematically working on various aspects of this reaction for the last 29 years with the main objective of understanding and developing the Baylis-Hillman reaction as a useful and powerful tool in synthetic chemistry.[9-21] We have in fact, contributed significantly to its growth with respect to all the three essential components.[9-15] We have also demonstrated very high applicability and potential of the Baylis-Hillman adducts in a number of organic transformations leading to the synthesis of different carbocyclic and heterocyclic compounds, including bioactive molecules.[16-21] This talk will present our vision, objectives, and endeavors towards the development of this reaction as a source of opportunities, challenges and creativity in synthetic chemistry keeping its applications as the primary goal.

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