Title:	Phosphine-Catalyzed Annulation of Designed Enones and Ynones
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Abstract:	The thesis describes the efforts towards the development of novel metal-free and phosphine-catalyzed strategies for the annulation of designed enones and ynones for synthesis of medium ring-sized carbocycles. The art of constructing complex molecular architecture has encouraged the generation of chemists to synthesize such molecules possessing significant biological and medicinal attributes. Inspired by the catalytic systems in nature, chemists looked into imitating biocatalytic processes. This led to the birth of organocatalysis, where small organic molecules bear the minimal functionalities that can activate the substrate and affect the reactions. Organocatalysts are less toxic, readily available, and less sensitive to air and moisture than metal catalysts. There are essentially four types of organocatalysts; Lewis bases, Lewis acids, Brønsted bases, and Brønsted acids. N-heterocyclic carbenes, amines, and phosphines are widely employed in catalysis among the Lewis bases. The use of trivalent phosphines as Lewis base significantly impacts organic synthesis for assembling a large variety of molecular frameworks. However, developing general, efficient, and atom-economic organocatalytic methods involving phosphine as a catalyst remains an emerging research area. The thesis entitled “Phosphine-Catalyzed Annulation of Designed Enones and Ynones” describes the efforts towards the development of novel phosphine-catalyzed intramolecular annulation strategies involving designed enones and ynones to construct medium ring-sized carbocycles. The content of the thesis has been divided into three chapters.
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