Carboamidation of Olefins using Unactivated Hydrocarbons enabled by Photoelectrochemistry

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Alkenes are ubiquitous building blocks in organic synthesis and radical-mediated 1,2-difunctionalization of alkenes constitutes an elegant method to construct complex molecules from abundant alkene feedstock.[1] A new method has been developed for the carboamidation of styrenes with varying electronic properties using an array of hydrocarbons. This mild methodology integrates photoredox catalysis (**PRC**) and synthetic organic electrochemistry (**SOE**) unveiling a new pathway in photoelectrochemistry (**PEC**)[2]. The present reaction reveals a photocatalytic hydrogen atom transfer (**HAT**)[3] and an electrochemically mediated radical polar crossover (**RPCO**). The reaction culminates in a Ritter-type amidation in the presence of a nitrile molecule.[4] The reported methodology adeptly activates a diverse range of alkanes allowing the hetero-difunctionalization of styrenes. (**Figure 1**). Finally, our method also offered a greener approach towards the synthesis of pharmaceutically relevant cores such as 1,*n*-amino alcohols[5], and amino-substituted ketones.[6]

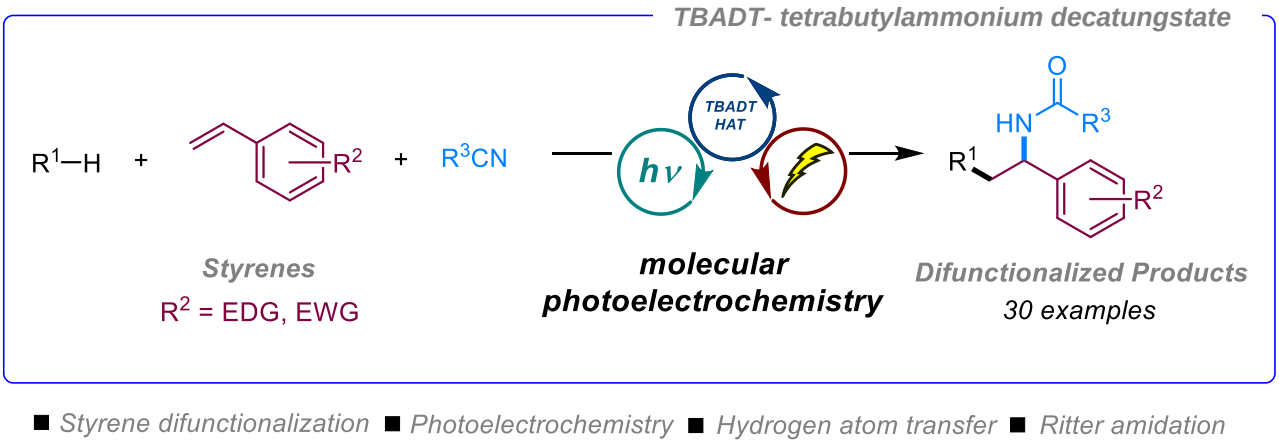

Figure 1: Photoelectrochemical styrene carboamidation *via* electro-recycled TBADT photocatalysis

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