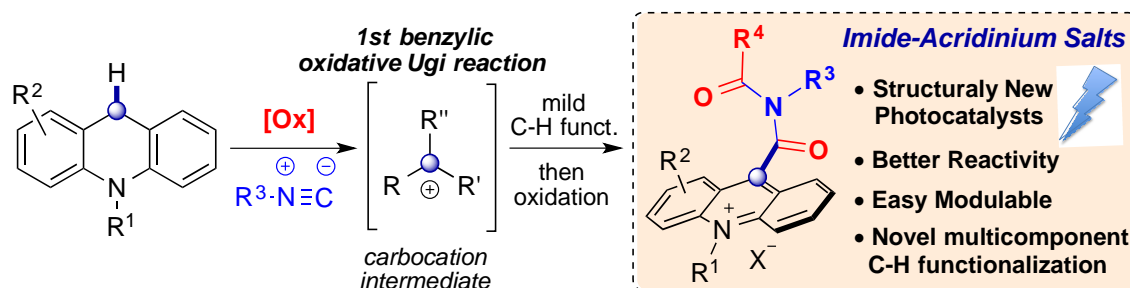


RATIONAL DESIGN OF NEW, MORE POTENT ACRIDIUM VISIBLE LIGHT ORGANO-PHOTOCATALYSTS BY C-H FUNCTIONALIZATION

O. García Mancheño

Münster University, Organic Chemistry Institute, Corrensstr. 40, 48149 Münster, Germany

In recent years, visible-light organo-photoredox catalysis was found as a valid and potent alternative for the commonly used photoredox catalysts based on ruthenium and iridium complexes.[1] In this regard, the acridinium-based photoredox catalysts have attracted a vast interest, especially in the form of the corresponding 9-mesityl derivatives.[2] Indeed, from the pioneering work of Fukuzumi and co-workers,[2a] the 9-mesityl N-methyl acridinium salt was found as one of the most powerful photoredox catalysts. However, it still presents substantial reactivity and stability limitations, for which more stable and active structures are needed. Aiming at solving some of the current limitations, and based on our expertise in acridane oxidative Csp³-H functionalization,[3] we have developed an innovative one-pot strategy towards C9-substituted acridinium salts, in which an oxidative Ugi-type process is involved as key step.[4]



We present herein a new class of easily tunable acridine-based structures with enhanced photoredox catalytic activity respect to the well-established C9-mesityl acridinium salt.[4] Various applications in photoredox-catalysis will be presented.[4][5] Moreover, based on DFT-calculations, fluorescence and quenching studies, the reasons of their superior performance are unveiled and discussed.

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