

# Excited State Dynamics of Photoactive Copper(I) Photosensitizers with an Extended $\pi$ -System

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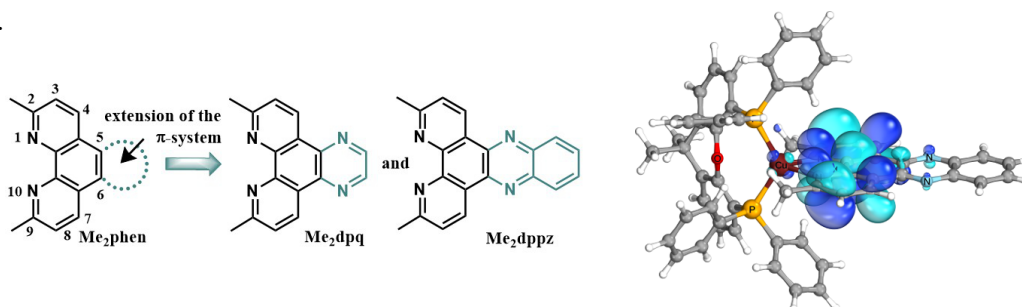
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Due to a global increasing energy consumption and limited reserves of fossil fuels alternative energy sources and carriers have to be explored.<sup>[1]</sup> In this respect, strong efforts have been made to develop multicomponent systems for the reduction of protons to hydrogen. These systems are often comprised of a photosensitizer (PS), a water reduction catalyst (WRC) and a sacrificial reductant.<sup>[2–5]</sup>

This contribution reports about the ultrafast relaxation pathways upon photoexcitation within a series of heteroleptic Cu(I) photosensitizers containing an extended  $\pi$ -system (see Figure). A combination of ultrafast time-resolved spectroscopy and luminescence lifetime measurements was applied to characterize the excited state properties of these photoactive complexes.<sup>[6]</sup> Thus, the structural flattening ( $\sim 1$ ps) and also the intersystem crossing ( $\sim 10$  ps) could be analyzed.



Further, the deactivation of the triplet excited states, which is of high importance for the subsequent photochemical reactions, was investigated in detail. The extension of the  $\pi$ -system causes different locations of the excited states on the respective diimine ligand. This results in fast deactivation processes. All in all, a direct correlation between the lifetime of the excited states and the catalytic performance is shown.<sup>[6]</sup>

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## References:

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