Università degli Studi di Padova

DiSC

Giovedì **30 maggio 2024** alle ore **15:00** presso l'aula I

il **Dr. Joshua P. Barham**

Institute of Organic Chemistry, Universität Regensburg (Germany).

terrà il seminario dal titolo:

Aggregation Matters: Diverting Mechanisms in Synthetic Photocatalytic and Photoelectrochemical Reactions

La presenza della S. V. sarà molto gradita

Prof. Andrea Sartorel

Il Direttore del Dipartimento
Stefano Mammi

Aggregation Matters: Diverting Mechanisms in Synthetic Photocatalytic and Photoelectrochemical Reactions

Dr. Joshua P. Barham
Universität Regensburg, Universitätsstr. 31, Regensburg, 93053, Germany
Joshua-Philip.Barham@ur.de +49 941 943-4373 www-oc.chemie.uni-regensburg.de/barham @BarhamLab

Since the turn of the 21st century, chemists increasingly take inspiration from natural photosynthesis, driving the synthesis of high-value organic molecules with *visible light-powered catalytic redox processes*. However, the scope of applications is constrained by i) the limited energy of visible light photons[1a] and ii) typical photocatalysts being unable to harness the full energy of the photon, due to rapid excited state deactivations. *Synthetic Photoelectrochemistry* is achieving new frontiers of reactivity and selectivity in single electron transfer-driven organic synthesis.[1b] This talk exemplifies how catalysts harnessing *a combination of electrochemical and photonic energies* achieve record-breaking redox processes (Fig. 1A,B).[2] With catalytic mechanisms a topic of current debate,[3] we find the key prerequisite for successful reactivity and high chemoselectivity are non-covalent preassemblies (aggregates) of the photoactive species and target substrate prior to photoexcitation.[2+3c,d] *Aggregation effects of photocatalysts/reactants* are gaining importance in contemporary synthetic photochemistry[4] and other examples from our lab will be discussed, including remote C(sp^3)-H fluorinations (not shown)[5a,b] and C(sp^3)-H oxidations (Fig. 1C).[5c]

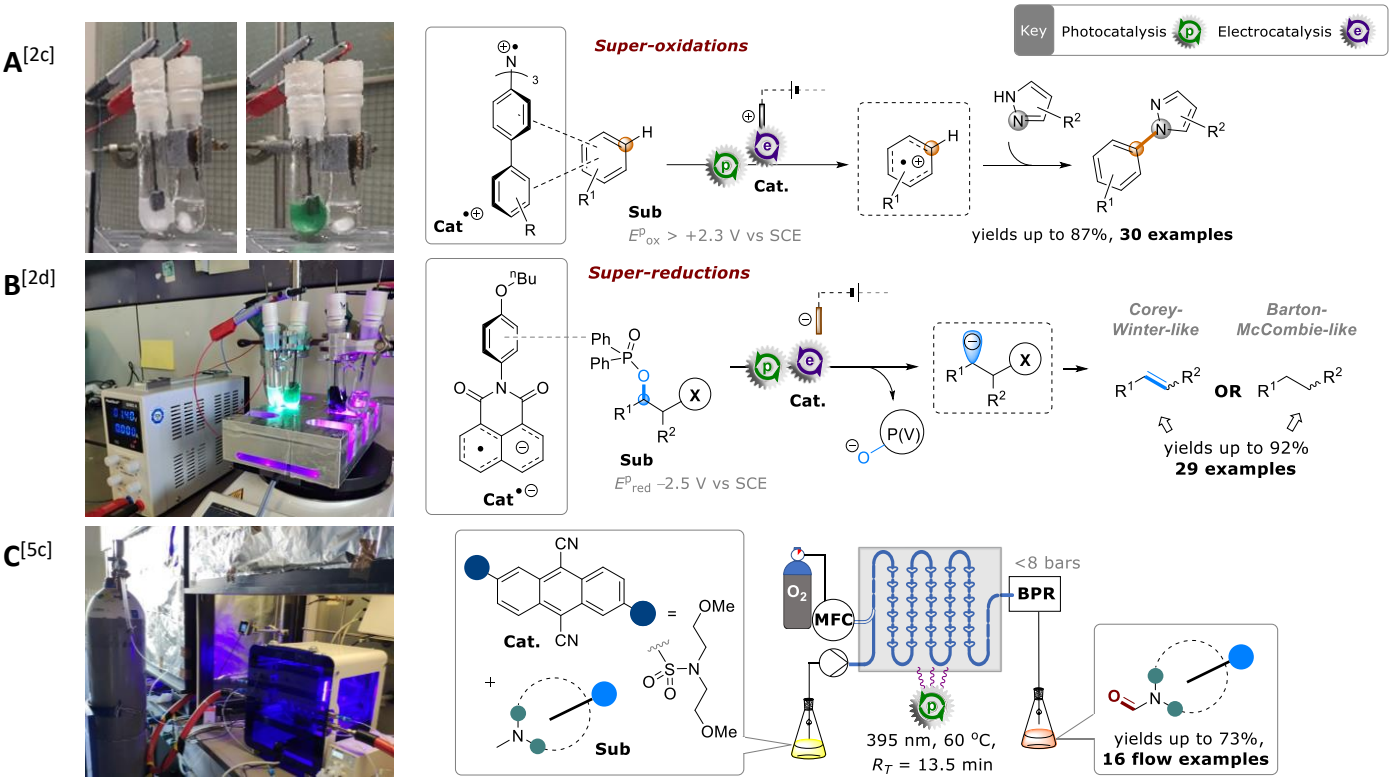

Fig. 1. Examples of electro-activated photocatalytic / photocatalytic reactions where aggregation matters.

References

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