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„Photoredox Catalysis: Organic Synthesis with Visible Light"

Vortragsort: Zoom Lecture

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Vortragszeit: 17:00

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Photoredox Catalysis: Organic Synthesis with Visible Light

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Sensitized photochemistry evolved over the last 20 years into an enabling technology for the synthesis of complex organic molecules due to new mechanistic concepts and advances in light sources.[1] The use of visible light and dual catalytic systems allow now challenging transformations with good selectivity under mild reaction conditions.[2] Although light is an ideal reagent for chemistry (cheap, safe, can be used in large excess) it comes with certain limitations:

1. Compared to chemical bond energies, the energy of a visible light photon is small and photocatalytic activation of stronger bonds therefore requires special strategies.[3]

2. Photoinduced electron transfer leads to radical ions or combined with proton transfer to radicals, but the majority of chemical reactions proceeds via ionic intermediates. How can we generate reactive anions by light?[4]

3. Metal complexes and organic dyes are widely used as molecular photocatalysts in synthesis, but their stability and reuse can be problematic. Organic semiconductors are a valid alternative, particular for applications at larger scale.[5]

The lecture discusses approaches from our laboratory to overcome these and other current and future challenges in chemical photocatalysis.

References

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