

Heterogeneous photoredox catalysis using graphitic carbon nitrides

Bartholomäus Pieber

Department of Biomolecular Systems, Max Planck Institute of Colloids and Interfaces,
Am Mühlberg 1, 14476 Potsdam, Germany

Visible-light photoredox catalysis has recently gained widespread recognition as a powerful tool for organic synthesis. This research field is dominated by expensive, homogeneous iridium or ruthenium complexes as photocatalysts that are not recycled. Heterogeneous semiconductors are promising sustainable alternatives given their straightforward recycling strategies (e.g. filtration) and ease of preparation. Such materials are already intensively studied for artificial photosynthesis, as well as waste water treatment, however, their application in organic synthesis remains scarce.

In this talk, I will discuss the progress my group has made in the utilization of heterogeneous graphitic carbon nitride (g-CN) polymers as photocatalysts for organic synthesis. I will focus on our efforts towards noble metal-free cross-coupling reactions via the combination of g-CN and first-row transition metal catalysis. Moreover I will present the development of a novel continuous flow methodology which is able to overcome the limitations associated with heterogeneous photocatalysis.

