**Nanostructured N-doped Carbon and Carbon nitride materials: Enzyme-like Heterogeneous Catalysts?**

Markus Antonietti\*

*Max Planck Institute of Colloids and Interfaces, Research Campus Golm, D-14424 Potsdam, Germany, antonietti@mpikg.mpg.de*

Carbon nanoparticles and nanostructures which are doped with the element nitrogen (“N-doped”) have special properties, among them high oxidation resistance and high electronic conductivity. These carbon materials can be made by thermal condensation

Of special monomers, among them for instance nucleobases

About 10 years ago, it was found that such carbons are very powerful electrocatalysts, even when metal-free, an can catalyse a number of “world reactions”, such as the reduction of oxygen or the conversion of soda water into formic acid. In addition, the materials are also very favourable supports for metallic nanocatalysts, which is attributed to a bulk heterojunction effect.

When going to even high nitrogen contents, Carbon nitrides or polyheptazinimides are obtained, and the resulting semiconductors can promote artificial photosynthesis, including water splitting and CO2 conversion. I will present a number of completely new chemical reactions only possible with such colloids which indicate how such clusters could have contributed to the existence of chemical diversity, potentially also on a prebiotic earth-like planet.

References:

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**Short Vitae:** Markus Antonietti is Director of the Max Planck Institute of Colloids and Interfaces and has contributed about 700 papers to the field of material/polymer chemistry in the last 30 years. His work was appreciated with a number of honours, and his current work is cited more than 9000 times/year, with an H-index of 145. Besides being a passionate scientist and academic mentor, he loves to prepare food and playing in a Rock’n’Roll band.