

Black Magic Chemistry: Functional Carbons replace noble metals, allow new reactions, and show enzyme-like properties

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In times of sustainability, Carbon materials with their high surface area and abundant functionality, best made from simple starting products, are a convincing choice. Here, the notation “carbon” is rather broad and includes a diversity of covalent organic compounds with different composition, architecture, textures and the related properties. A common denominator is however that all these systems are made by cross-linking processes to become insoluble, rather inert solids at elevated temperatures.

I will summarize in my talk some of our recent approaches to generate novel carbons, e.g. noble carbons, “oxocarbons” or P-carrying carbons, focusing on simplicity (the real sophistication)

I will show that many of the resulting 2d- and 3d structures are chemo-, photo- and electrocatalytically active, partly exceeding reference noble metal catalysts. Some special systems show even enzyme-like behavior for non-biological reactions, such as binding and conversion from nanomolar concentrations in complex media for environmental cleaning or polymer degradation of otherwise stable polymers.



Markus Antonietti is Director of the Max Planck Institute of Colloids and Interfaces and has contributed with about 1000 papers to the field of material/polymer chemistry in the last 35 years. His work was appreciated with a number of honours, and his current work is cited about 13000 times/year, with an H-index of 226. He is also active in fusion cuisine and is singer of a pub rock band.