Prof. Dr. Arne Lützen

Chemistry on different length scales - from molecules to supramolecular aggregates and optoelectronic devices

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Abstract

In order to achieve functional supramolecular aggregates and materials chemists have to master challenges on different length scales starting from making and breaking of chemical bonds on the subnanometer level to make individual molecules, which can either aggregate into discrete supramolecular architectures in the 1-10 nanometer regime, or into (sub)micrometer thin films or even bulk materials with interesting magnetic or optical properties due to a network of non-covalent interactions defined by the nature and relative spatial arrangement of their functional groups. Within this lecture we will make a journey starting from some of our synthetic work done to prepare our target molecules followed by some selected examples of their use as molecular receptors, affinity materials in sensors, or their coordination-driven self-assembly into metallosupramolecular aggregates. Finally, some examples of the aggregation of π-conjugated oligomers and their use as active components of optoelectronic devices will be discussed.

Professional career

Arne Lützen was born in Schleswig close to the Danish border in 1969. He studied chemistry at the University of Oldenburg where he obtained his Ph. D. in Organic Chemistry in 1997 under the supervision of Prof. Dr. Peter Köll in the field of carbohydrate chemistry. He then joined the group of Prof. Dr. Julius Rebek, Jr. at the Scripps Research Institute in La Jolla, USA as a postdoc. He returned to Oldenburg to work on his habilitation in the field of supramolecular chemistry. He received the ADUC Award for Habilitands in 2003 and the Gerhard-Wachsmann-Prize and the Teaching Award of the University of Oldenburg in 2004. After a short time at the University of Duisburg-Essen he moved to the University of Bonn in 2006. In 2013 he received the Teaching Award of the University of Bonn and in 2017 the Teaching Award of the Faculty of Mathematics and Natural Sciences of the University of Bonn.

Research interests

His research interests include various areas of supramolecular chemistry including self-assembly of metallosupramolecular aggregates and π-conjugated molecules, self-sorting-effects, allosteric effects, molecular recognition, analytical tools for supramolecular chemistry, and organic synthesis.