Nanosystems Engineering: A New Concept

Nanosystems have been recently found to be important for many applications and also the bottom-up approach for the preparation of the required nanomaterials has received special attention. When introducing the concept of supramolecularity, novel approaches for the synthesis of interesting nanosystems can be designed and developed. The employment of nano-sized building blocks in conjunction with other components such as macrocycles, metals, and biopolymers allows to translate these concepts into reality and to produce new classes of nanomaterials and nanocomposites. These fundamentally novel concepts are presented and highlighted both as synthetic approaches and in the context of their applications. Several model systems with carbon and non-carbon nanotubes as well as nanoparticles have been studied and examples of their interaction products based on different types of reactions and syntheses are given. The novel nanosystems are expected to have an application potential in many areas such as the biomedical and electronic areas.