

Sequential Self-Assembly of Block Copolymers with Small Molecules, Metal Atoms or Metal Ions for Functional Hybrid Nano-Colloids

Xiaosong Wang

Department of Chemistry, Waterloo Institute of Nanotechnology (WIN)

University of Waterloo, Waterloo, N2L 3G1

Comparing to concurrent self-assembly in which two components assemble simultaneously, the process of sequential assembly is relatively controllable. We have explored this process for precise synthesis of hybrid colloids with designed nanostructures. Block copolymers, due to its well studied self-assembly behavior, were used as the first components. Various building blocks including small molecules, e.g. C₆₀, metal atoms, or metal ions have been chosen as a second component for sequential self-assembly studies. Consequently, a number of hybrid colloids with defined hierarchical structures in terms of size, morphology and composition have been produced. The resulting colloids exhibit either enhanced or new functions due to synergetic effect of two components, making them potentially useful in nanotechnology.