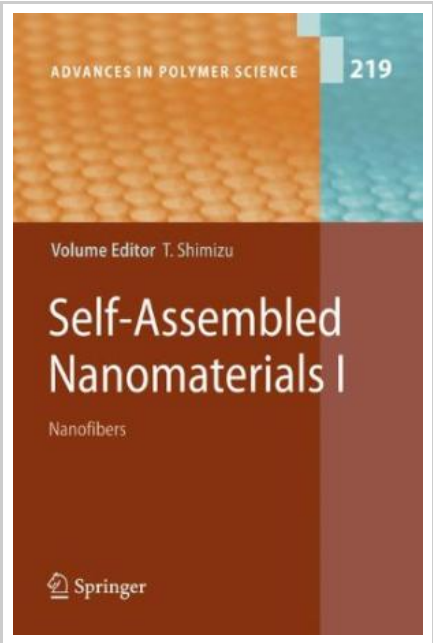

Self-Assembled Nanomaterials I

By Toshimi Shimizu

Springer Sep 2008, 2008. Buch. Book Condition: Neu. 23.5x15.5x cm. Neuware - Nanotechnology is the creation of useful materials, devices, and systems through the control of matter on the nanometer-length scale. This takes place at the scale of atoms, molecules, and supramolecular structures. In the worldofchemistry,therationaldesignofmolecularstructuresandoptimized control of self-assembly conditions have enabled us to control the resultant self-assembled morphologies having 1 to 100-nm dimensions with sing- nanometer precision. This current research trend applying the bottom-up approach to molecules remarkably contrasts with the top-down approach in nanotechnology,inwhichelectronicdevicesareminiaturizingtosmallerthan 30nm.However,even engineers workingwithstate-of-the-artcomputer te-nology state that maintaining the rate of improvement based on Moore s law will be the most dif cult challenge in the next decade. On the other hand, the excellent properties and intelligent functions of a variety of natural materials have inspired polymer and organic chemists to tailortheirsyntheticorganicalternativesbyextractingtheessentialstructu ral elements. In particular, one-dimensional structures in nature with sophis- catedhierarchy,suchasmyelinated axonsinneurons,tendon,proteintubesof tubulin, and spider webs, provide intriguingexamples of integrated functions and properties. Againstthisbackground,supramolecularself-assemblyofone-dimensional architectures like bers and tubes from amphiphilic molecules, bio-related molecules, and properly designed self-assembling polymer molecules has - tractedrapidlygrowinginterest.Theintrinsicpropertiesoforganicmolecules such asthe diversity ofstructures, facile implementation offunctionality and theaggregationproperty providein nite possibilities

Reviews

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