

FOREWORD

Nanostructured material has been a very exciting research topic in the past two decades. The impact of these researches to both fundamental science and potential industrial application has been tremendous and is still growing. There are many exciting examples of nanostructured materials in the past decades including colloidal nanocrystal, bucky ball C_{60} , carbon nanotube, semiconductor nanowire, and porous material. The field is quickly evolving and is now intricately interfacing with many different scientific disciplines, from chemistry to physics, to materials science, engineer and to biology. The research topics have been extremely diverse. The papers in the literature on related subjects have been overwhelming and is still increasing significantly each year.

The research on nanostructured materials is highly interdisciplinary because of different synthetic methodologies involved, as well as many different physical characterization techniques used. The success of the nanostructured material research is increasingly relying upon the collective efforts from various disciplines. Despite the fact that the practitioners in the field are coming from all different scientific disciplines, the fundamental of this increasing important research theme is unarguably about how to make such nanostructured materials. For this reason, chemists are playing a significant role since the synthesis of nanostructured materials is certainly about how to assemble atoms or molecules into nanostructures of desired coordination environment, sizes, and shapes. A notable trend is that many physicists and engineers are also moving towards such molecular based synthetic routes.

The exploding information in this general area of nanostructured materials also made it very difficult for newcomers to get a quick and precise grasp of the status of the field itself. This is particularly true for graduate students and undergraduates who have interest to do research in the area. The purpose of this book is to serve as a step-stone for people who want to get a glimpse of the field, particularly for the graduate students and undergraduate students in chemistry major. Physics and engineering researchers would also find this book useful since it provides an interesting collection of novel nanostructured materials, both in terms of their preparative methodologies and their structural and physical property characterization.

The book includes thirteen authoritative accounts written by experts in the field. The materials covered here include porous materials, carbon nanotubes, coordination networks, semiconductor nanowires, nanocrystals, Inorganic Fullerene, block copolymer, interfaces, catalysis and nanocomposites. Many of these materials represent the most exciting, and cutting edge research in the recent years.

While we have been able to cover some of these key areas, the coverage of book is certainly far from comprehensive as this wide-ranging subject deserves. Nevertheless, we hope the readers will find this an interesting and useful book.

Feb. 2003

Peidong Yang
Berkeley, California