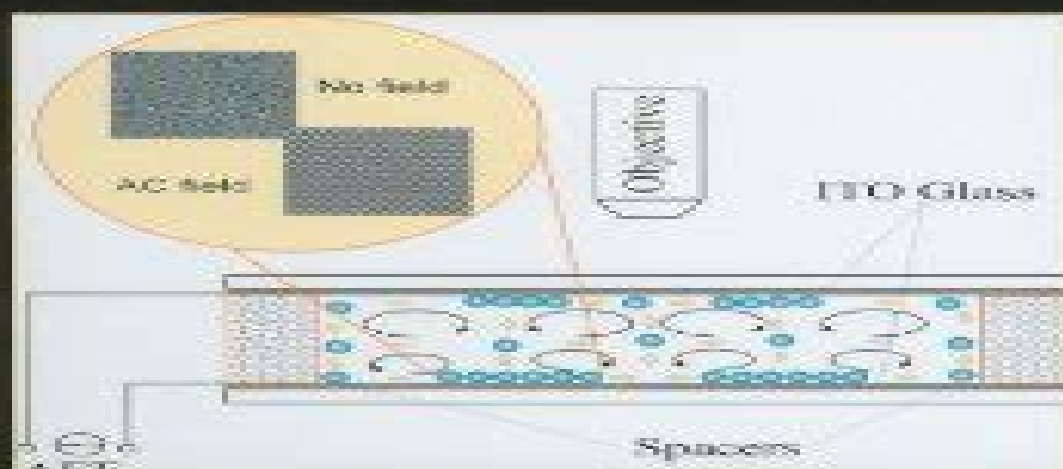


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# *Nanoscale Structure and Assembly at Solid-Fluid Interfaces*

*Volume 1: Interfacial Structures versus Dynamics*



Edited by Xiang Yang Liu and James J. De Yoreo

# Nanoscale Structure And Assembly At Solidfluid Interfaces

**Xiang Yang Liu**



## **Nanoscale Structure And Assembly At Solidfluid Interfaces:**

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compatibility assessment of nanostructured materials implemented in the medical field by the combination of classical biological protocols and advanced non destructive nano precision techniques with special emphasis on the topographical surface energy optical and electrical properties Materials in the physical form of nanoparticles nanotubes and thin films are addressed in terms of their toxicity The different pillars of the Nanomedicine field are also highlighted The book takes an interdisciplinary approach of medicine biology pharmacy physics chemistry engineering nanotechnology and materials science The international group of authors specifically chosen for their distinguished expertise belong to the academic and industrial world in order to provide a broader perspective It appeals to researchers and graduate students

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**Handbook of Crystal Growth** Tatau Nishinaga, 2014-11-04 Volume IAHandbook of Crystal Growth 2nd Edition Fundamentals Thermodynamics and Kinetics Volume IA addresses the present status of crystal growth science and provides scientific tools for the following volumes Volume II Bulk Crystal Growth and III Thin Film Growth and Epitaxy Volume IA highlights thermodynamics and kinetics After historical introduction of the crystal growth phase equilibria defect thermodynamics stoichiometry and shape of crystal and structure of melt are described Then the most fundamental and basic aspects of crystal growth are presented along with the theories of nucleation and growth kinetics In addition the simulations of crystal growth by Monte Carlo ab initio based approach and colloidal assembly are thoroughly investigated Volume IBHandbook of Crystal Growth 2nd Edition Fundamentals Transport and Stability Volume IB discusses pattern formation a typical problem in crystal growth In addition an introduction to morphological stability is given and the phase field model is explained with comparison to experiments The field of nanocrystal growth is rapidly expanding and here the growth from vapor is presented as an example For the advancement of life science the crystal growth of protein and other biological molecules is indispensable and biological crystallization in nature gives many hints for their crystal growth Another subject

discussed is pharmaceutical crystal growth To understand the crystal growth in situ observation is extremely powerful The observation techniques are demonstrated Volume IA Explores phase equilibria defect thermodynamics of Si stoichiometry of oxides and atomistic structure of melt and alloys Explains basic ideas to understand crystal growth equilibrium shape of crystal rough smooth transition of step and surface nucleation and growth mechanisms Focuses on simulation of crystal growth by classical Monte Carlo ab initio based quantum mechanical approach kinetic Monte Carlo and phase field model Controlled colloidal assembly is presented as an experimental model for crystal growth Volume IIB Describes morphological stability theory and phase field model and comparison to experiments of dendritic growth Presents nanocrystal growth in vapor as well as protein crystal growth and biological crystallization Interprets mass production of pharmaceutical crystals to be understood as ordinary crystal growth and explains crystallization of chiral molecules Demonstrates in situ observation of crystal growth in vapor solution and melt on the ground and in space

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encompasses discussion of high temperature processes and global geochemical cycle modeling Analysis of textures of rocks sediments and mineral surfaces are incorporated throughout and provide a sub theme of the book     **Biom mineralization**

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New Perspectives on Mineral Nucleation and Growth Alexander E.S. Van Driessche,Matthias Kellermeyer,Liane G. Benning,Denis Gebauer,2016-12-20 In the last decade numerous studies have demonstrated the existence of alternative pathways to nucleation and crystallisation that oppose the classical view Such proposed scenarios include multistage reactions proceeding via various precursor species and or intermediate phases The aim of this book is to review and discuss these recent advances in our understanding of the early stages of mineralisation through a series of contributions that address both experimental and theoretical studies about the formation and nature of initial precursor species e g prenucleation clusters dense liquid phases amorphous nanoparticles etc as well as their transformations leading to the stable mineral phase Several chapters are devoted to cutting edge analytical techniques used for investigating the above processes in situ in real time and at conditions relevant to both natural and industrial processes At the end of the book the editors summarize the key questions that still need to be addressed in order to establish a complete picture of the nucleation and growth processes involved during the formation of minerals



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