

Cambridge University Press

978-1-605-11274-9 - Materials Research Society Symposium Proceedings Volume 1297:

Deformation Mechanisms, Microstructure Evolution and Mechanical Properties of Nanoscale Materials

Editors Julia R. Greer, Ting Zhu, Blythe G. Clark, Daniel S. Gianola and Alfonso H.W. Ngan

Table of Contents

[More information](#)

CONTENTS

Preface	ix
Materials Research Society Symposium Proceedings.....	xii
* Nanometer Scale Mechanical Behavior of Grain Boundaries	1
Chien-Kai Wang, Huck Beng Chew, and Kyung-Suk Kim	
Correlation between Adhesion Strength and Thin Film/Substrate Mechanical Properties Using the Nano-scratch Technique	11
Bo Zhou, Nicholas Randall, and Barton Prorok	
Bottom-up Modeling of the Elastic Properties of Organosilicate Glasses and Their Relation to Composition and Network Defects	17
Jan M. Knaup, Han Li, Joost J. Vlassak, and Efthimios Kaxiras	
Evaluation of Crack Growth Retardation Effect Due to Nano-scale Voids Based on Molecular Dynamics Method	23
Shin Taniguchi and Toshihiro Kameda	
Synthetic Control over the Structure and Symmetry of Carbon Nanotubes: Towards Biomedical Applications	29
Michael S. Lowry, Alfredo Rayns-Keller, Karen J. Long, Francisco Santiago, Victor H. Gehman, Jr., and Kevin A. Boulais	
A Phase-Field—Finite Element Model for Instabilities in Multilayer Thin Films	35
Mohsen Asle Zaeem, Sinisa Dj. Mesarovic, Haitham El Kadiri, and Paul T. Wang	

*Invited Paper

Cambridge University Press

978-1-605-11274-9 - Materials Research Society Symposium Proceedings Volume 1297:
Deformation Mechanisms, Microstructure Evolution and Mechanical Properties of
Nanoscale MaterialsEditors Julia R. Greer, Ting Zhu, Blythe G. Clark, Daniel S. Gianola and Alfonso H.W. Ngan
Table of Contents[More information](#)

Interphase Energies and Nonequilibrium Growth of γ-precipitates in Al-Ag: A DFT Study	47
D.J. Watts, D.D. Johnson, and Daniel Finkenstadt	
Influence of Nanoindenter Tip Radius on the Estimation of the Elastic Modulus	53
Karim R. Gadelrab and Matteo Chiesa	
Inception of Plasticity in the Presence of Vacancies in FCC Single Crystals: Indenter Size Effect	59
I. Salehinia, V. Perez, M. Weber, and D.F. Bahr	
NanoLAB Triboprobe: Characterizing Dynamic Wear, Friction and Fatigue at the Nanoscale	65
A.J. Lockwood, J. Wedekind, R.S. Gay, J.J. Wang, M.S. Bobji, B. Amavasai, M. Howarth, G. Möbus, and B.J. Inkson	
Nondeterministic Multiscale Modeling of Biomimetic Crack Self-Healing in Nanocrystalline Solids under Mechanical Loading	71
Eduard G. Karpov and Mykhailo Grankin	
Deformation Mechanisms, Microstructure and Mechanical Properties of Nanoscale Crystalline and Noncrystalline Materials in Different Temperature Ranges	77
Yuly V. Milman	
* Thermo-Mechanical Behavior at Nanoscale and Size Effects in Shape Memory Alloys	83
Jose San Juan, Maria L. Nó, and Christopher A. Schuh	
Nanoscale deformation of MEMS materials	95
A.J. Lockwood, A. Padmanabhan, R.J.T. Bunyan, and B.J. Inkson	
Pressure-Induced Nano-Crystallization of Y_2O_3	101
Stuart Deutsch, Jafar F. Al-Sharab, Bernard H. Kear, and Stephen D. Tse	

*Invited Paper

Cambridge University Press

978-1-605-11274-9 - Materials Research Society Symposium Proceedings Volume 1297:

Deformation Mechanisms, Microstructure Evolution and Mechanical Properties of

Nanoscale Materials

Editors Julia R. Greer, Ting Zhu, Blythe G. Clark, Daniel S. Gianola and Alfonso H.W. Ngan

Table of Contents

[More information](#)**Reaction Pathway Analysis of Homogeneous Dislocation****Nucleation in a Perfect Molybdenum Crystal 105**Hasan A. Saeed, Satoshi Izumi,
Shotaro Hara, and Shinsuke Sakai**Atomistic Study of the Mechanical Properties****of Metallic-Glass Nanowires 111**

K. Koshiyama and K. Shintani

Atomistic Study of the Mechanical Stability**of Multi-layered Graphene Nanobridges 117**

T. Nakajima and K. Shintani

In Situ Spectroscopy and Modeling of Deformation**Behavior of Nanoscale Interfacial Materials 123**Takakazu Suzuki, W. Suetaka,
A. Suzuki, T. Sato, and T. Suzuki**Micro/Nano Structure and Morphology****of Multi-phase Polymer/Oxide Composites****Prepared by Powder Melt Processing 131**Giorgiana Giancola
and Richard Lehman**Influence of Processing Conditions on Mechanical
and Structural Properties of DLC Produced****by FIB-CVD Method 137**Naomichi Sakamoto, Yusai Akita,
Hiroyuki Harada, Takuya Yasuno,
and Yasuo Kogo**Effect of Ag Content on Electrical Conductivity****and Tensile Properties of Cu-Ti-Ag Alloys 143**Taek-Kyun Jung, Dong-Woo Joh,
Hyo-Soo Lee, and Hyuk-Chon Kwon**Size Effect on Bending Properties of Diamond-like Carbon****Nanopillar Fabricated by Focused Ion Beam-Assisted****Chemical Vapor Deposition 149**Yasuo Kogo, Hiroyuki Harada,
Yoji Shibutani, Naomichi Sakamoto,
and Takuya Yasuno

Cambridge University Press

978-1-605-11274-9 - Materials Research Society Symposium Proceedings Volume 1297:
Deformation Mechanisms, Microstructure Evolution and Mechanical Properties of
Nanoscale MaterialsEditors Julia R. Greer, Ting Zhu, Blythe G. Clark, Daniel S. Gianola and Alfonso H.W. Ngan
Table of Contents[More information](#)

Density Functional Theory Calculations of Properties of the Grain Boundaries in Aluminum.	155
Marek Muzyk and Krzysztof J. Kurzydlowski	
Strengthening Effect of Twin Boundaries in bcc Crystal Evaluated through a Micro-bending Test.	161
Yuki Karasawa, Tso-Fu Mark Chang, Akinobu Shibata, and Masato Sone	
Mechanical Behavior on Micro-compression Test in Ultra-low Carbon Steel Produced by High Pressure Torsion	169
Takashi Nagoshi, Akinobu Shibata, Masato Sone, and Yoshikazu Todaka	
Characterizing the Role of Deformation during Electrochemical Etching of Metallic Films	175
Anil Kumar, Keng Hsu, Kyle Jacobs, Placid Ferreira, and Nicholas X. Fang	
Modeling the Dislocation-Void Interaction in a Dislocation Dynamics Simulation	181
Sylvain Queyreau, Ghiaut Monnet, Brian D. Wirth, and Jaime Marian	
Nanoindentation Induced Deformation Near Grain Boundaries of Corrosion Resistant Nickel Alloys.....	187
F. William Herbert, Bilge Yildiz, and Krystyn J. Van Vliet	
Profiling of the Mechanical Properties of Ultralow-<i>k</i> Films Using Nanoindentation Techniques	193
Holm Geisler, Ulrich Mayer, Matthias U. Lehr, Petra Hofmann, and Hans-Juergen Engelmann	
Author Index	199
Subject Index	201