

**MATERIALS RESEARCH SOCIETY
SYMPOSIUM PROCEEDINGS VOLUME 1137**

**Nano- and Microscale Materials-
Mechanical Properties and
Behavior under Extreme
Environments**

December 1-5, 2008
Boston, Massachusetts, USA

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571
www.proceedings.com

ISBN: 978-1-61567-386-5

Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2008) by the Materials Research Society
All rights reserved.

Printed by Curran Associates, Inc. (2010)

For permission requests, please contact the Materials Research Society
at the address below.

Materials Research Society
Proceedings
506 Keystone Dr.
Warrendale, PA 15086

Phone: 724-779-3004 x 531
Fax: 724-779-4396

eproceedings@mrs.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: currans@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

Multi-Million Atom Molecular Dynamics Study of Combustion Mechanism of Aluminum Nanoparticle	1
<i>W. Wang, R. Clark, A. Nakano, R.K. Kalia, P. Vashishta</i>	
Identifying the limitation of Oliver and Pharr Method in Characterizing the Viscoelastic-plastic Materials with Respect to Indenter Geometry	7
<i>K. Balasundaram, Y. Cao, D. Raabe</i>	
High-temperature Deformation Kinetics of Gold at 473K to 773K.....	13
<i>V. Bhakri, R.J. Klassen</i>	
Degradation of Vertically Aligned Carbon Nanotubes at Growth Interface Joints at High Temperatures and Its Impact on Electron Emission Properties.....	19
<i>F. Jin, Y. Liu, C.M. Day, S.A. Little</i>	
Crystallization-induced Stress in Phase Change Random Access Memory.....	25
<i>M.H. Li, J.M. Li, L.P. Shi, H.X. Yang, T.C. Chong, Y. Li</i>	
Accelerating Copper Dissociated Dislocations to Transonic and Supersonic Speeds.....	31
<i>P.S. Branicio, H. Tsuzuki, J.P. Rino</i>	
Nanoimprinting of Metals by Highly-Grafted Nanotube Arrays.....	37
<i>L. Li, Z. Xia, Y. Yang</i>	
X-ray Micro Laue Diffraction and Neutron Diffraction Analysis of Residual Elastic Strains in a 1% Uniaxial Tensile Tested Nickel Alloy 600 Sample.....	43
<i>J. Chao, A. Mark, M.L.S. Fuller, R.I. Barabash, N.S. McIntyre, R.A. Holt, R.J. Klassen, W. Liu</i>	
High Strain-Rate Behavior of High Strength Aluminum Alloys.....	49
<i>K. Elkhodary, W. Lee, B. Cheeseman, D.W. Brenner, M.A. Zikry</i>	
First-principles Calculations of Adhesive Behavior at Metal/oxide Incoherent Interface	55
<i>D. Matsunaka, Y. Shibutani</i>	
Atomistic Simulation Studies of Indentation into Cu-Ni and Cu-Nb Bilayers	60
<i>S.N. Medyanik, S. Shao</i>	
Atomic Scale Simulations of Orientation of Loading Axis on the Growth of Voids at the Onset of Ductile Failure in Single Crystal Cu	68
<i>A.M. Dongare, A.M. Rajendran, B. LaMattina, M.A. Zikry, D.W. Brenner</i>	
Structural Study of the Formation of Suspended Linear Atomic Chains from Platinum Nanowires Stretching	74
<i>P.A.S. Autreto, F. Sato, M. Lagos, P.Z. Coura, S.O. Dantas, V. Rodrigues, D. Ugarte, D.S. Galvao</i>	

Studies of the Elastic Properties of Amorphous Silica by Molecular Dynamics Simulations	80
<i>H. Ristolainen, A. Kuronen, K., Nordlund, M. Fujikane, R. Nowak</i>	
Mechanical Properties in Individual Carbon Nanofibers at High Temperature and High Pressure by Molecular Dynamics Simulations	85
<i>J. Gu, F. Sansoz</i>	
Modeling the Effect of Varying Electrical Voltage on the Plastic Deformation of a Single Asperity in Hot-Switched RF MEMS Contacts.....	91
<i>J.W. Crill, D.L. Irving, C.W. Padgett, M. Zirky, D.W. Brenner</i>	
Mechanical Behavior Associated with Heterogeneous Grain-boundary Diffusion and Sliding in Nanocrystalline Materials.....	97
<i>Y. Wei, A.F. Bower, H. Gao</i>	
In-situ Surface Characterization of Mechanical and Electronic Behavior During Ion-Induced Nanostructure Synthesis	102
<i>D.L. Rokusek, C.R. Wagener, M. Nieto-Perez, J.P. Allain</i>	
Strength Enhancements of Nanoscale Multilayers for MEMS Electrodes in Oxidizing Environments	108
<i>A. Bellou, R.L. Schoeppner, D.F. Bahr</i>	
The Strength of Nanoporous Gold: Strain Gradient and Intrinsic Size Effects.....	114
<i>B. Derby, R. Dou</i>	
Formation of Nanostructures in Al-Mg Alloys Subjected to Severe Plastic Deformation.....	119
<i>M. Liu, H.J. Roven, M. Murashkin, R.Z. Valiev, A. Kilmametov, T. Ungar, L. Balogh</i>	
Stress Relaxation in a Nanoinclusion in Response to Extreme Environments	125
<i>V.V. Chaldyshev, A.L. Kolesnikova, A.E. Romanov</i>	
Study of Microstructure and Texture of Heavily Cold Worked TiTaNb Alloy and the Effect of Annealing	131
<i>A. Dasgupta, K. Laha, R. Kayalvizhi, B. Jeyaganesh, S. Raju, S. Murugesan, S. Saroja, V.S. Sarma, M. Vijayalakshmi</i>	
Characterization of Local Deformation Microstructure in Ferrous Lath Martensite by using Micro-sized Specimens	137
<i>Y. Ogawa, A. Shibata, C. Ishiyama, M. Sone, Y. Higo</i>	
Impact Sensitivity of Variable Density Composite Energetic Materials	143
<i>E. Hunt, M.L. Pantoya</i>	
Author Index	