

**MATERIALS RESEARCH SOCIETY**  
**SYMPOSIUM PROCEEDINGS VOLUME 899**

# **Dynamics in Small Confining Systems**

November 28 – December 2, 2005  
Boston, Massachusetts, USA

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571  
[www.proceedings.com](http://www.proceedings.com)

ISBN: 1-55899-854-3

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

CAMBRIDGE UNIVERSITY PRESS  
Cambridge, New York, Melbourne, Madrid, Cape Town,  
Singapore, São Paulo, Delhi, Tokyo, Mexico City

Cambridge University Press  
32 Avenue of the Americas, New York, NY 10013-2473, USA

[www.cambridge.org](http://www.cambridge.org)

Materials Research Society  
506 Keystone Drive, Warrendale, PA 15086  
<http://www.mrs.org>

©Materials Research Society 2027

This publication is in copyright. Subject to statutory exception  
and to the provisions of relevant collective licensing agreements,  
no reproduction of any part may take place without the written  
permission of Cambridge University Press.

First published 2027

CODEN: MRSPDH

ISBN: 3/77: ; /: 76/5

Cambridge University Press has no responsibility for the persistence or  
accuracy of URLs for external or third-part Internet Web sites referred to  
in this publication and does not guarantee that any content on such Web sites  
is, or will remain, accurate or appropriate.

**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: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## TABLE OF CONTENTS

- 1 The Effect of Tethering on the Chemical Kinetics of Single Bonds**  
*Koch, Karl-Wilhelm;Merkel, Rudolf;Nguyen-Duong, Melanie*
- 7 Dynamics of DNA Conformations and DNA-Protein Interactions**  
*Ambjornsson, Tobias;Krichevsky, Oleg;Lomholt, Michael;Metzler, Ralf*
- 19 Transport of Molecules Through Carbon Nanotube Channels in Aqueous Environment: A Molecular Dynamics Study**  
*Chen, Maodu;Xue, Yongqiang*
- 25 Fabrication of Nanoparticles and Microspheres with Uniform Magnetic Half-Shells**  
*Anker, Jeffrey;Clarke, Roy;Kopelman, Raoul;McNaughton, Brandon;Stoica, Vladimir;Tyner, Katherine*
- 34 Water Mobility in Reverse Micelles Studied by Quasielastic Neutron Scattering and Molecular Dynamics Simulation**  
*Ladanyi, Branka;Levinger, Nancy*
- 46 Ultrafast Orientational Dynamics of Nanoconfined Benzene**  
*Farrer, Richard;Fourkas, John;Zhu, Xiang*
- 52 Small Molecule Diffusion in Polymer Ultra-Thin Films**  
*Henderson, Clifford;Ludovice, Peter;Ordaz, Ivan;Singh, Lovejeet*
- 58 Nanocharacterization of Relaxation Properties in Organic Thin Film Electronic Materials**  
*Gray, Tomoko;Overney, Rene*
- 69 Finite Conductivity Effects and Apparent Contact Angle Saturation in AC Electrowetting**  
*Baret, Jean-Christophe;Cross, Benjamin;Kumar, Abishek;Mugele, Frieder;Pluntke, Manuela*
- 77 Model Silica Pores with Controllable Surface Chemistry for Molecular Dynamics Simulations**  
*Gulmen, Tolga;Thompson, Ward*
- 87 Chemically Selective Reactions in Confined Spaces in Hybrid Aerogels**  
*Liu, Xipeng;Risen, Jr., William;Yao, Chunhua*
- 93 Effect of Nanostructure on the Thermal Oxidation of Atomized Iron**  
*Kumar, Mohit;Rawat, Naveen;Santhanam, Kalathur*

- 99 Molecular Dynamics Studies of Surface Nucleation and Crystal Growth of Si on SiO<sub>2</sub> Substrates**  
*Baik, Hong Koo;Kuranaga, Takahide;Lee, Byoung Min;Motooka, Teruaki;Munetoh, Shinji*
- 105 Surface-Passivant Dependence of Dynamic Charging Effect in Alkanethiolate-Passivated Au Nanoparticles on Graphite Substrates Studied by Photoelectron Spectroscopy**  
*Imamura, Masaki;Tanaka, Akinori;Yasuda, Hidehiro*
- 111 Dynamics of Director Fluctuations in Confined Liquid Crystals**  
*Aliev, Fouad;Arroyo, Edwin;Basu, Sarmistha*
- 117 The Encounter Probability for Random Walkers in a Confined Space**  
*Lavine, James*
- 123 Analysis of Electromigration- And Stress-Induced Dynamical Response of Voids Confined in Metallic Thin Films**  
*Cho, Jaeseol;Gungor, M. Rauf;Maroudas, Dimitrios*
- 129 Simulation Study of Confinement Effects on the Melting Transition in Hexane and Decane Monolayers Between Two Graphite Slabs**  
*Pint, Cary;Roth, Michael*
- 135 Radial-Breathing Mode Frequencies for Single-Walled Carbon Nanotubes of Arbitrary Chirality: First-Principles Calculations**  
*Areshkin, D.;Lawler, Hadley;Mintmire, J.W.;White, C.T.*
- 141 Nano-Thermometry: Transmission Electron Microscopy of Femtosecond Laser Irradiated Co/Si Multilayer Thin Foils**  
*Picard, Yoosuf;Yalisove, Steven*
- 146 Nanobubble Formation at the Solid-Liquid Interface Studied by Atomic Force Microscopy**  
*Agrawal, Abhinandan;McKinley, Gareth*
- 152 Relation Between Structure and Diffusion in Nanostructured Porous Solids and in Lipid Membranes**  
*Kärger, Jörg;Vasenkov, Sergey*
- 158 Ballistic and Diffusive Random Walks in Confinement**  
*Levitz, Pierre*
- 164 Solvent Behavior in Hydrophobic Silica Nanotubes**  
*English, Douglas;Jayaraman, Karthik;Lee, Sang Bok;Luckett, Charles;Okamoto, Kenji;Son, Sang Jun*
- 171 Microstructured Surfaces for Drag Reduction Purposes: Experiments and Simulations on Rectangular 2D Riblets**  
*Kasemo, Bengt;Rapp, Håkan;Zoric, Igor*

- 179 Synchrotron X-Ray Scattering Studies of the Surface Structure and Dynamics of Liquids and Liquid Films**  
*Hu, Xuesong;Jiang, Zhang;Jiao, Xuesong;Kim, Hyunjung;Lal, Jyotsana;Lee, Heeju;Lee, Young Joo;Li, Chunhua;Lurio, Laurence;Rafailovich, Miriam;Sinha, Sunil*
- 188 Evidence of Re-Entrant Behavior in Laponite-PEO Systems**  
*Baghdadi, Hossein;Bhatia, Surita;Easwar, Nalini;Jensen, Elizabeth*
- 193 Poly(Methyl Phenyl Siloxane) in Random Nanoporous Glasses: Comparison of Coated and Uncoated Confining Surfaces**  
*Goering, Harald;Schick, Christoph;Schoenhals, Andreas*
- 199 Spontaneous Imbibition of Liquids Into Nanopores**  
*Huber, Patrick;Kityk, Andriy;Knorr, Klaus*
- 205 Dielectric and Optical Properties of Polymer Confined in Random Porous Matrices**  
*Aliev, Fouad*