

CURRICULUM VITAE

A. MICHAEL TSAPATSI, Professor, Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, tsapatsi@cems.umn.edu, (612) 626-0920

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EDUCATION:

Postdoctoral Training, Chem. Eng., California Institute of Technology (with M.E. Davis) **1994**
Ph.D., Chemical Engineering, California Institute of Technology (Advisor: G.R. Gavalas) **1994**
MS, Chemical Engineering, California Institute of Technology **1991**
Diploma, Chemical Engineering, University of Patras, Greece **1988**

PROFESSIONAL APPOINTMENTS:

Amundson Chair in Chemical Engineering and Materials Science **2/08-present**
 Professor, University of Minnesota Twin Cities **9/03- present**
 Associate Professor (early tenure awarded), University of Massachusetts, Amherst **9/99-9/03**
 Assistant Professor, University of Massachusetts, Amherst **9/94-9/99**
 Research Fellow in Chemical Engineering, California Institute of Technology **12/93-9/94**
 Research Assistant, California Institute of Technology **9/89-12/93**
 Engineer, Research Institute of Chemical Engineering and High Temperature Chemical Processes, Greece **9/88-9/89**
 Student Research Assistant, Greek Electricity Company, Greece **6/85-9/85**

Honors/AWARDS:

George W. Taylor Award for Distinguished Research, Institute of Technology, UMN 2008
 Charles M.A. Stine Award, Materials Engineering & Sciences Division of AIChE 2007
 Shell Land-Grant Chair in Chemical Engineering and Materials Science, UMN 2004-2007
 Merck Sharp and Dohme Lectures, University of Puerto Rico, Mayaguez (11/06) 2006
 Van Ness Lectures, Rensselaer Polytechnic Institute, Troy, NY (10/06) 2006
 Robert W. Vaughan Lecture, California Institute of Technology (4/20/06) 2006
 DB Robinson Distinguished Speaker, University of Alberta (4/06) 2006
 Stratis V Sotirchos Memorial Lecture, FORTH/ICE-T, Greece (5/26/05) 2005
 Honda Initiation Grant (with L Schmidt) 2004
 G.C.A. Schuit Lecture, University of Delaware (5/14/2004) 2004
 Outstanding Junior Faculty Award, College of Engineering, UMass-Amherst 1998
 Camille Dreyfus Teacher-Scholar Award 1998
 David and Lucile Packard Fellowship for Science and Engineering 1996
 NSF CAREER Award 1996
 National Center for Electron Microscopy/Department of Energy Fellow 1995
 North American Membrane Society Fellowship 1993
 Graduate Research Fellowship (California Institute of Technology) 1989- 1993
 Prize of the Greek Chamber of Chemical Engineers 1988
 Scholarships from the Greek National Foundation of Scholarships 1986- 1988

PROFESSIONAL ACTIVITIES:

Session Chair, ZMPC'97, Tokyo, Japan 1997
 Participant, National Academy of Engineering Frontiers of Engineering 1997
 Participant, National Science Foundation Workshop on Self Assembly 1998

Session Chair, North American Membrane Society Meeting	1998
Session Chair, 16th North American Catalysis Society Meeting (Zeolites and Microporous Cat.)	1999
Session Chair, AIChE Annual Meeting, Dallas, TX	1999
Session Chair, ZMPC'2000, Sendai, Japan	2000
Session Chair and Advisory Committee Member, ICCMR, Zaragosa, Spain	2000
Session Chair, AIChE Annual Meeting, Reno, Nevada	2001
Session Chair, AIChE Annual Meeting, Indianapolis, IN	2002
Participant, DOE Workshop on Catalysis	2002
Participant, DOE/NRC Workshop on Carbon Dioxide	2003
Participant, NSF Workshop on Catalysis	2003
Session Chair, AIChE Annual Meeting, San Francisco, CA	2003
International Conference on Inorganic Membranes (ICIM) – Sort Course on Membrane Synthesis	2004
Workshop on New Developments in Membranes and Transport (Organizer with T. Lodge)	2005
Session Chair: PACIFICHEM	2005
International Scientific Committee ICIM9, Norway	2006
International Scientific Committee 4 th IZMM, Spain	2007
Session Chair, AIChE Annual Meeting, Salt Lake City	2007
International Scientific Committee ICIM 10, Tokyo, Japan	2008
International Scientific Committee ZMPC (Zeolites and Microporous Crystals)	2009
Symposium Organizer, PACIFICHEM	2010
Co-Organizer 5 th IZMM, Greece	2010

Reviewer of Journal Articles for: *Advanced Functional Materials, Advanced Materials, AIChE J., Angew. Chemie Int. Ed., Catalysis Letters, Chemistry of Materials, Chemical Engineering Science, Industrial and Engineering Chemistry Research, Journal of the American Chemical Society, Journal of the American Ceramic Society, Journal of Membrane Science, Microporous and Mesoporous Materials, Nature, Nature Materials, Science, and others (~70 papers per year)*

Reviewer of Proposals for: *ACS/PRF, NSF, DOE, European Union, Korea and Canada funding Agencies*

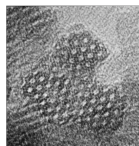
Consultant: *Various Companies* **2001-**

Editorial Board Member: *Microporous and Mesoporous Materials* **2001-2008**

Regional Editor: *Microporous and Mesoporous Materials* **2008-**

PROFESSIONAL AFFILIATIONS:

American Institute of Chemical Engineers
 American Chemical Society
 Materials Research Society
 Catalysis Society of New England (Treasurer) 1997-2003



B. RESEARCH ACTIVITIES:

Research Interests: The focus of our work is in demonstrating innovative processing strategies for engineering functional devices and microstructures. These produce highly selective membranes and catalysts with tailored properties and can be used to make chemical sensors, electronic and optical components. We combine synthetic chemistry, processing, and characterization with careful evaluation of microstructures and properties. Our publications focus on molecular sieve synthesis, crystal structure elucidation, pattern formation, morphology control, and incorporation in engineering devices.

JOURNAL PUBLICATIONS (~3,700 total citations; h index = 35)

1. **Journal of the American Chemical Society** 130, 1507-1516 (2008) (with Maheshwari S., Kumar S., Bates F.S., Penn R.L. and Shantz D.F.) *Layer Structure Preservation during Swelling, Pillaring and Exfoliation of a Zeolite Precursor*
2. **Angew. Chem. Int. Ed.** 47(23), 4262-4263 (2008) (with Maheshwari S.) *Pores by Pillaring: Not Always a Maze (Invited Highlight for the paper A Novel Route to Microporous Materials: Oxidative Pillaring of Micas by Baumgartner, A.; Thun, J.; Breu, J., Angewandte Chemie International Edition* 47, 1640 (2008))
3. **Microporous and Mesoporous Materials** In Press (2008) (with Choi S., Coronas J., Sheffel J.A., Jordan E., Oh W., Nair S. and Shantz D.F) *Preparation of a New Layered Silicate Material by Proton Exchange and Reactive Swelling of Nanoporous Layered Silicate AMH-3*
4. **Microporous and Mesoporous Materials** In Press (2008) (with Karanikolos G.N., Hermenegildo G. and Corma A.) *On the Seeded Growth of $AlPO_4-5$ and $CoAPO-5$ Films*
5. **Journal of Membrane Science** 312(1-2), 163-173 (2008) (with Covarrubias C., García R., Arriagada R., Yáñez J., Ramanan H. and Lai Z.) *Removal of Trivalent Chromium Contaminant from Aqueous Media Using FAU-type Zeolite Membranes*
6. **Journal of Membrane Science** 316(1-2), 145-152 (2008) (with Choi S., Coronas J., Yust D., Lai Z., and Onorato F.) *Fabrication and gas separation properties of polybenzimidazole (PBI) / nanoporous silicates hybrid membranes*
7. **Angew. Chem. Int. Ed.** 47(3), 552-555 (2008) (with Choi S., Coronas J., Jordan E. Oh W., Nair S., Onorato F. and Shantz D.) *A Layered Silicate by AMH-3 Intercalation and its Use in Nanocomposite Membranes for Gas Separation.*
8. **Microporous and Mesoporous Materials** 110, 330-338 (2008) (with Woo M and Choi J) *Poly(1-trimethylsilyl-1-propyne)/MFI Composite Membranes for Butane Separations*
9. **Langmuir** 23(25), 12469-12472 (2007) (with Davis T. and Snyder M.) *Germania Nanoparticles and Nanocrystals at Room Temperature in Aqueous Lysine Sols*
10. **Industrial & Engineering Chemistry Research** 46(22), 7096-7106 (2007) (with Choi J., Lai Z., Gosh S., Beving D. and Yan Y.S.) *Layer-by-Layer Deposition of Barrier and Permselective c-Oriented-MCM-22/Silica Composite Films.*
11. **Angew. Chem. Int. Ed.** 46, 7560-7573 (2007) (with Snyder M.) *Hierarchical Nano-Manufacturing: From Shaped Zeolite Nanoparticles to High Performance Separation Membranes*
12. **Langmuir** 23(20), 9924-9928 (2007) (with Snyder M., Lee J.A., Davis T. and Scriven L.E.) *Silica Nanoparticle Crystals and Ordered Coatings Using Lys-Sil and a Novel Coating Device (Appeared on the cover)*
13. **Macromolecules** 40(18), 6638-6646 (2007) (with Maheshwari S. and Bates F.S.) *Synthesis and Thermodynamic Properties of Poly(cyclohexylethylene-b-dimethylsiloxane-b-cyclohexylethylene)*
14. **European Polymer Journal** 43(9), 3737-3749 (2007) (with Durmus A., Woo A., Kasgoez A. and Macosko C.W.) *Intercalated Linear Low Density Polyethylene (LLDPE)/clay Nanocomposites Prepared with Oxidized Polyethylene as a New Type Compatibilizer: Structural, Mechanical and Barrier Properties.*
15. **Journal of Membrane Science** 295 (1-2), 50-70 (2007) (with Sheffel J.) *A Model for the Performance of Microporous Mixed Matrix Membranes with Oriented Selective Flakes.*
16. **Journal of Physical Chemistry B** 111(13), 3398-3403 (2007) (with Kumar S., Davis T., Ramanan H. and Penn R.L.) *Aggregative Growth of Silicalite-1.*
17. **Chemistry of Materials** 19(7), 1601-1612 (2007) (with Villaescusa L.A., Diaz I., Barrett P.A., Lloris-Cormanó J.M., Martínez Mané R., Terasaki O., Liu Z. and Cambor M.) *The Pure Silica Large Pore Zeolite ITQ-7: Synthetic Strategies, Structure Directing Effects and Control and Nature of Structure Disorder.*
18. **Microporous and Mesoporous Materials** 101, 97-107 (2007) (with Drews T.) *Model of the Evolution of Nanoparticles to Crystals via an Aggregative Growth Mechanism.*

19. **Chemistry of Materials** 19(4), 792-797 (2007) (with Karanikolos G.N., Wydra J.W., Stoeger J.A., Corma A. and Hermenegildo G.) *Continuous c-Oriented AlPO₄₋₅ Films by Tertiary Growth*.
20. **Chemistry of Materials** 18(25), 5814-16 (2006) (with Davis T.M., Snyder, M. and Krohn J.) *Silica Nanoparticles in Aqueous Solutions of Lysine*.
21. **Journal of the American Chemical Society** 128(50), 16138-47 (2006) (with Caratzoulas S. and Vlachos D.G.) *Potential of Mean Force for Tetramethylammonium Binding to the Cage-like Silicates Si₆O₆¹⁵⁻ and Si₈O₈⁻²⁰ in Aqueous Solution*.
22. **Adsorption** 12(5-6), 339-360 (2006) (with Choi J., Ghosh S., King L.M.) *MFI Zeolite Membranes from a- and Randomly Oriented Seed Monolayers*.
23. **Langmuir** 22, 9350-9356 (2006) (with Krohn J.) *Phenylalanine and Arginine Adsorption in Zeolites X, Y and Beta*.
24. **Langmuir** 22, 5217-5219 (2006) (with Lee J.A., Meng L., Norris D. J. and Scriven L.E.) *Colloidal Crystal Layers of Hexagonal Nanoplates by Convective Assembly*.
25. **Nature Materials** 5, 400-408 (2006) (with Davis T.M., Drews T.O., Ramanan H., He C., Dong J., Schnablegger H., Katsoulakis M., Kokkoli E., McCormick A.V. and Penn R. L.) *Mechanistic Principles of Nanoparticle Evolution to Zeolite Crystals*.
26. **Journal of Membrane Science** 277(1-2), 195-202 (2006) (with Pechar T.W., Kim S., Vaughan B., Marand E., Jeong H.W. and Cornelius C.J.) *Fabrication and Characterization of Polyimide-Zeolite L Mixed Matrix Membranes for Gas Separations*.
27. **Journal of Membrane Science** 277(1-2), 210-218 (2006) (with Pechar T.W., Kim S., Vaughan B., Marand E., Baranauskas V., Riffle J. and Jeong H.W.) *Preparation and Characterization of a Poly(imide siloxane) and Zeolite L Mixed Matrix Membrane*.
28. **Microporous and Mesoporous Materials** 90(1-3), 307-303 (2006) (with Jobic H., Ramanan H., Auerbach S.M., and Fouquet P.) *Probing cooperative jump-diffusion in zeolites: Neutron spin-echo measurements and molecular dynamics simulations of benzene in NaX*.
29. **Journal of the American Chemical Society** 128(2), 596-606 (2006) (with Caratzoulas S. and Vlachos D.G.) *On the Stability of the Silica Hexamers Si₆O₁₅⁶⁻ and Preferential Stabilization of the Octamers Si₈O₂₀⁸⁻ in Tetramethylammonium Solution. A Molecular Dynamics Study*.
30. **Angew. Chem. Int. Ed.** 45, 1154-1158 (2006) (with Choi J., Ghosh S. and Lai Z.) *Uniformly a-Oriented MFI Films by Secondary Growth*.
31. **Journal of Physical Chemistry B** 109(50), 23879-23887 (2005) (with Drews T. and Katsoulakis M.) *A Mathematical Model for Crystal Growth by Aggregation of Precursor Metastable Nanoparticles*.
32. **Current Opinion in Colloid and Interface Science** 10(5,6), 233-238 (2005) (with Drews T.) *Progress in Zeolite Morphology Manipulation and Related Applications*
33. **Industrial and Engineering Chemistry Research** 44(24), 9086-9095 (2005) (with Mabande G.T.P., Ghosh S., Lai Z. and Schwieger W.) *Preparation of b-Oriented MFI Films on Porous Stainless Steel Substrates*.
34. **Microporous and Mesoporous Materials** 84, 332-337 (2005) (with Jeong H.W., Lai Z. and Hanson J.) *Strain of MFI Crystals in Membranes: An in situ Synchrotron X-Ray Study*.
35. **Journal of Physical Chemistry B** 109(20), 10429-10434 (2005) (with Caratzoulas S. and Vlachos D.G.) *Molecular Dynamics Studies on the Role of Tetramethylammonium Cations in the Stability of the Silica Octamers in Solution*.
36. **Langmuir** (with Krohn J.) 21(19), 8743-8750 (2005) *Amino acid Adsorption in Zeolite Beta*.
37. **Physical Review B** 71, 104301 (2005) (with Nair S., Chowdhuri Z., Peral I., Neumann D.A., Dickinson L.C., Tompsett G. and Jeong H.-K.) *Translational Dynamics of Water in a Nanoporous Layered Silicate*.
38. **Chemistry of Materials** 16(26), 5697-5705 (2004) (with Bonilla G., Diaz I., Jeong H.-K., Lee Y. and Vlachos D.G.) *Zeolite (MFI) Crystal Morphology Control Using Organic Structure Directing Agents*.
39. **Chemistry of Materials** 16(25), 5226-5232 (2004) (with Diaz I., Kokkoli E. and Terasaki O.) *On the surface structure of Zeolite (MFI) Crystals*.

40. **Journal of Chemical Physics** 121:(10), 4810-4819 (2004) (with Nair S., Dimeo R.M., Neumann D.A. and Horsewill A.J.) *Methyl Rotational Tunneling Dynamics of p-xylene Confined in a Crystalline Zeolite Host.*
41. **Journal of Physical Chemistry B** 108:(44), 17171-17178 (2004) (with Auerbach S.A. and Ramanan H.) *Beyond Lattice Models of Activated Transport in Zeolites: High-temperature Molecular Dynamics of Self- and Cooperative-Diffusion of Benzene in NaX.*
42. **Journal of Physical Chemistry B** 108:(44), 17179-17187 (2004) (with Auerbach S.A. and Ramanan H.) *Predicting Benzene Fluxes in NaX Membranes from Atomistic Simulations of Cooperative Diffusivities.*
43. **Microporous and Mesoporous Materials** 76:(1-3), 29-33 (2004) (with Snyder M.A., Lai Z. and Vlachos D.G.) *Simultaneous Reflectance and Fluorescence Imaging of MFI Membranes for Conclusive Identification of Polycrystalline Features.*
44. **Industrial and Engineering Chemistry Research** 43:(12), 3000-3007 (2004) (with Lai Z.) *Gas and Organic Vapor Permeation through b-oriented MFI Membranes.*
45. **AIChE Journal** 50(3), 684-695 (2004) (with Gummalla M. Watkins J.J., and Vlachos D.G.) *Multiscale Hybrid Modeling of Film Deposition within Porous Substrates.*
46. **Angew. Chem. Int. Ed.** 43:(35), 4558-4561 (2004) (with Ramanan H. and Kokkoli E.) *On the TEM and AFM Evidence of Zeolite Nanoslabs Present During the Synthesis of Silicalite-1.*
47. **Chemistry of Materials** 16:(20), 3838-3845 (2004) (with Jeong H.K., Krych W., Ramanan H., Nair S. and Marand E.) *Fabrication of Polymer/Selective-Flake Nanocomposite Membranes and Their Use in Gas Separation.*
48. **Industrial and Engineering Chemistry Research** 43:(12), 3073-3084 (2004) (with Lebedeva M.I. and Vlachos D.G.) *Bifurcation Analysis of Liesegang Ring Pattern Formation*
49. **Advanced Functional Materials** 14:(7), 716-729 (2004) (with Lai Z. and Nikolich J.P.) *Siliceous ZSM-5 Membranes by Secondary Growth of b-oriented Seed Layers.* (Appeared on the cover)
50. **Physical Review Letters** 92:(8), 88301-1-4 (2004) (with Lebedeva M.I. and Vlachos D.G.) *Bifurcation Analysis of Liesegang Ring Pattern Formation*
51. **Angew. Chem. Int. Ed.** 42:(25), 2905-2909 (2003) (with Giraldo O., Durand J.P., Ramanan H., Laubernds K., Suib S.L., Brock S.L. and Marquez M.) *Dynamic Organization of Inorganic Nanoparticles Into Periodic Micrometer-Scale Patterns.*
52. **Journal of Physical Chemistry B.** 107:(37), 10006-10016 (2003) (with Kragten D.D., Fedeyko J.M., Sawant K.R., Rimer J.D., Vlachos D.G. and Lobo R.F.) *Structure of the Silica Phase Extracted from Silica/(TPA)OH Solutions Containing Nanoparticles.*
53. **Applied Physics Letters** 82:(19), 3357-3359 (2003) (with Bhattacharya M. and Vlachos D.G.) *Periodic Patterning in Materials Deposition by Self-Regulating Diffusion-Reaction Processes.*
54. **Langmuir** 19:(11), 4619-4626 (2003) (with Nikolakis V. and Vlachos D.G.) *Physicochemical Characterization of Silicalite-1 Surface and its Implication on Crystal Growth.*
55. **Science** 300:(5618), 456-460 (2003) (with Lai Z., Bonilla G., Diaz I., Nery J.G., Sujaoti K., Amat M., Kokkoli E., Terasaki O., Thompson R. and Vlachos D.G.) *Microstructural Optimization of a Zeolite Membrane for Organic Vapor Separation.* (Appeared on the cover)
56. **Industrial and Engineering Chemistry Research** 42:(1), 1321-1328 (2003) (with Gummalla M., Watkins J.J. and Vlachos D.G.) *Roles of Transients and Nucleation in Film Deposition within a Support.*
57. **Nature Materials** 2:(1), 53-58 (2003) (with Jeong H.K., Nair S., Vogt T. and Dickinson L.C.) *A Highly Crystalline Layered Silicate with Three-Dimensionally Microporous Layers.*
58. **Microporous and Mesoporous Materials** 58:(2), 81-89 (2003) (with Nair S.) *Infrared Reflectance Measurements of Zeolite Film Thickness, Refractive Index and Other Characteristics.*
59. **Journal of the American Chemical Society** 124:(44), 12966-12968 (2002) (with Jeong H.K., Krohn, J. and Sujaoti K.) *Oriented Molecular Sieve Membranes by Heteroepitaxial Growth.*

60. **J. Chem. Soc. Chem. Commun.** (20) 2398-2399 (2002) (with Jeong H.K. and Chandrasekaran A.) *Synthesis of a New open Framework Cerium Silicate and its Structure Determination by Single Crystal X-ray Diffraction.*
61. **Desalination** 146:(1-3), 3-9 (2002) (with Pechar T.W., Marand E. and Davis R.) *Preparation and Characterization of a Glassy Fluorinated Polyimide Zeolite-Mixed Matrix Membrane.*
62. **AIChE Journal** 48:(4), 654-659 (2002) *Molecular Sieves in the Nanotechnology Era.* (Appeared on the cover)
63. **Nature** 412, 720-724 (2001) (with Kuznicki S. M., Bell V.A., Nair S., Hillhouse H.W., Jacobinas R.M., Braunbarth C.M. and Toby B.) *A Titanosilicate Molecular Sieve with Tunable Pores and its Use in Gas Separations.*
64. **Journal of the American Chemical Society** 123:(51), 12781-12790 (2001) (with Nair S., Toby B. and Kuznicki S.M.) *A Study of Heat-Treatment Induced Framework Contraction in Strontium-ETS-4 by Powder Neutron Diffraction and Vibrational Spectroscopy.*
65. **Chemistry of Materials** 13:(11), 4247-4254 (2001) (with Jeong H.-K., Nair S., Braunbarth C.M. and Kuznicki S.M.) *Synthesis and Structure Determination of Large ETS-4 Crystals.*
66. **Microporous and Mesoporous Materials** 48:(1-3), 219-228 (2001) (with Nair S., Nikolakis V., Xomeritakis G., Lai Z. and Bonilla G.) *Separation of Close-Boiling Hydrocarbon Mixtures by MFI and FAU Membranes Made by Secondary Growth.*
67. **Microporous and Mesoporous Materials** 44-45, 639-643 (2001) (with Hillhouse H.W., van Egmond J.W., Hanson J.C. and Larese J.Z.) *The Interpretation of X-ray Diffraction Data for the Determination of Channel Orientation in Mesoporous Films.*
68. **Chemistry of Materials** 13:(6), 2023-2031 (2001) (with Fernandes N.E., Fisher S.M., Poshusta J.C., Vlachos D.G. and Watkins J.J.) *Reactive Deposition of Metal Thin Films within Porous Supports from Supercritical Fluids.*
69. **Angew. Chem. Int. Ed.** 40:(6), 1069-1071 (2001) (with Okubo T., Wakihara T., Plévert J., Nair S., Ogawa Y., Komiyama H., Yoshimura M. and Davis M.E.) *Epitaxial Growth of Zeolite.*
70. **Journal of Membrane Science** 182:(1-2), 103-109 (2001) (with Bonilla G., Vlachos D.G. and Xomeritakis G.) *Fluorescence Confocal Optical Microscopy of the Grain Boundaries of MFI-type Zeolite Membranes Made by Seeded Growth.*
71. **Journal of Membrane Science** 184:(2), 209-219 (2001) (with Nikolakis V., Xomeritakis G., Abibi A., Dickson M. and Vlachos D.G.) *Synthesis of FAU Type Zeolite Membranes and their Use in the Separation of Saturated from Unsaturated Hydrocarbons.*
72. **Journal of Membrane Science** 184:(2), 245-255 (2001) (with Nelson P. and Auerbach, S) *Modeling Permeation Through Anisotropic Zeolite Membranes with Nanoscopic Defects.*
73. **Industrial and Engineering Chemistry Research** 40:(2), 544-552 (2001) (with Xomeritakis G. and Lai Z.) *Separation of Xylene Isomer Vapors with Oriented MFI Membranes made by Seeded Growth.*
74. **Microporous and Mesoporous Materials** 42:(2-3), 191-203 (2001) (with Bonilla G. and Vlachos D.G.) *Simulations and Experiments on the Growth and Microstructure of Zeolite MFI Films and Membranes Made by Secondary Growth.*
75. **Microporous and Mesoporous Materials** 42:(1), 21-35 (2001) (with Jones C.W., Okubo T. and Davis M.E.) *Organic-Functionalized Molecular Sieves (OFMSs): III Shape Selective Catalysis.*
76. **Journal of the American Chemical Society** 122:(51), 12864-12865 (2000) (with Vlachos D.G., Kim S., Ramanan H. and Gavalas G.R.) *Spontaneous Formation of Periodically Patterned Deposits by CVD.*
77. **Chemistry of Materials** 12:(10), 2888-2893 (2000) (with Hillhouse H.W., van Egmond J.W., Hanson J.C. and Larese J.Z.) *Ordering of Topological Defects in Mesoporous Silica Films.* (Appeared on the cover)
78. **Journal of the American Chemical Society** 122:(49), 12158-12163 (2000) (with Giraldo O., Marquez M., Brock, L.S., Suib S.L. and Hillhouse H.W.) *Spontaneous Formation of Inorganic Helical Fibers and Rings.*

79. **Journal of Physical Chemistry B.** 104:(38), 8982-8988 (2000) (with Nair S.) *The Location of o- and m-Xylene in Silicalite by Powder X-ray Diffraction.*
80. **Chemistry of Materials** 12:(7), 1857-1865 (2000) (with Braunbarth C., Hillhouse H.W., Nair S., Burton A., Lobo R.F., Jacubinas R. and Kuznicki S.) *Structure of Strontium-ion-exchanged ETS-4 Microporous Molecular Sieves.*
81. **Journal of Membrane Science** 174:(1), 31-42 (2000) (with Braunbarth C. and Boudreau L.) *Deposition of Films and Membranes of the Titanosilicate ETS-4.*
82. **Nature** 405, 38 (2000) (with Giraldo O., Brock, L.S., Marquez M., Suib S.L. and Hillhouse H.W.) *Spontaneous Formation of Inorganic Helices.*
83. **Microporous and Mesoporous Materials** 38, 61-73 (2000) (with Xomeritakis G. and Nair S.) *Transport Properties of Alumina-Supported MFI Membranes Made by Secondary Growth.*
84. **Chemistry of Materials** 12, 845-853 (2000) (with Nikolakis V., Kokkoli E., Tirrell M. and Vlachos D.G.) *Zeolite Growth by Addition of Subcolloidal Particles: Modeling and Experimental Validation.*
85. **CATTECH** 6, 148-163 (2000) *Zeolite Membranes-a review.*
86. **JMRS Bulletin** 24, 30-35 (1999) (with Gavalas G. R.) *Synthesis of Inorganic Membranes.*
87. **Chemistry of Materials** 11:(12), 3545-3554 (1999) (with Ma Y., Suib S.L., Ressler T., Wong J. and Lovallo M.) *Synthesis of Porous CrOx Pillared Octahedral Layered Manganese Oxide Materials.*
88. **Journal of Chemical Physics** 111:(5) 2143-2150 (1999) (with Nikolakis V. and Vlachos D.G.) *Modeling of Zeolite L Crystallization Using Continuum Time Lattice Monte Carlo Simulations.*
89. **J. Chem. Soc. Chem. Commun.** 921-922 (1999) (with Nair S., Villascusa L.A. and Cambor M.A.) *Zeolite- β Grown Epitaxially on SSZ-31 Nanofibers.*
90. **Chemistry of Materials** 11, 875-878 (1999) (with Xomeritakis G.) *Permeation of Aromatic Isomer Vapors through Oriented MFI-type Membranes Prepared by Secondary Growth.*
91. **Chemical Engineering Science** 54, 3521-3531 (1999) (with Xomeritakis G., Gouzinis A., Nair S., He M., Overney R. and Okubo T.) *Growth, Microstructure, and Permeation Properties of Supported Zeolite (MFI) Films and Membranes Prepared by Secondary Growth.*
92. **Langmuir** 15, 4544-4550 (1999) (with Hillhouse H.W. and van Egmond J.W.) *Highly Oriented Mesostructured Thin Films: Shear Induced Deposition of Optically Anisotropic Coatings of Tungsten Oxide/Surfactant Composites.* (Appeared on the cover)
93. **Journal of Membrane Science** 152, 41-59 (1999) (with Boudreau L. and Kuck J.) *Deposition of Oriented Zeolite A Films: In Situ and Secondary Growth.*
94. **Chemistry of Materials** 10, 2497-2504 (1998) (with Gouzinis A.) *On the Preferred Orientation and Microstructural Manipulation of Molecular Sieve Films Prepared by Secondary Growth.*
95. **Journal of Physical Chemistry** 102(37), 7139-7147 (1998) (with Wagner P., Yoshikawa M., Lovallo M.C., Tsuji K. and Davis M.E.) *CIT-5: A High Silica Zeolite with 14-Ring Pores.*
96. **Journal of Catalysis** 179, 565-580 (1998) (with Jentoft R., Davis M.E. and Gates B.C.) *Platinum Clusters Supported in Zeolite LTL: Influence of Catalyst Morphology on Performance in n-Hexane Reforming.*
97. **AIChE Journal**, 44(8), 1903-1913 (1998) (with Lovallo M.C. and Gouzinis A.) *Synthesis and Characterization of Oriented MFI Membranes Prepared by Secondary Growth.*
98. **Microporous and Mesoporous Materials**, 21, 337-346 (1998) (with Nikolakis V. and Vlachos D.G.) *Modeling of Zeolite Crystallization: the Role of Gel Microstructure.*
99. **J. Chem. Soc. Chem. Commun.** 2179 (1997) (with Wagner P., Yoshikawa M., Lovallo M.C., Tsuji K. and Davis M.E.) *CIT-5: A High Silica Zeolite with 14-Ring Pores.*
100. **Journal of the American Chemical Society**, 119(36), 8474-8484 (1997)(with Lobo R.F., Freyhardt C.C., Khodabandeh S., Wagner P., Chen C.-Y., Balkus K.J., Zones S.I. and Davis M.E.) *Characterization of the Extra-large Pore Zeolite UTD-1.*
101. **Chemistry of Materials**, 9(8), 1705-1709 (1997) (with Boudreau L.) *A Highly Oriented Thin Film of Zeolite A.* (Appeared on the cover)

102. **Chemistry of Materials**, 9(7), 1505-1507 (1997) (with Hillhouse H., Okubo T. and van Egmond J.W.) *Preparation of Mesoporous Silica Layers in a Continuous Flow Cell.*
103. **AIChE Journal**, 43(7), 1849-1860 (1997) (with Gavalas G.R.) *Modeling of SiO₂ Deposition in Porous Vycor. Effects of Pore Network Connectivity.*
104. **Journal of the American Chemical Society**, (119)16, 3732-3744 (1997) (with Lobo R. F., Freyhardt C., Chan I., Chen C.-Y., Zones S. I. and Davis M.E.) *A Model for the Structure of the Large Pore Zeolite SSZ-31.*
105. **AIChE Journal**, 42(11), 3020-3029 (1996) (with Lovallo M.C.) *Preferentially Oriented Submicron Silicalite Membranes.*
106. **Nature** 381, 295-298 (1996) (with Freyhardt C., Lobo R.F., Balkus K.J. Jr. and Davis M.E.) *A High Silica Zeolite with a 14-tetrahedral-atom Pore Opening.*
107. **Chemistry of Materials**, 8, 1579-1583 (1996)(with Lovallo M. C. and Okubo T.) *Preparation of Asymmetric Zeolite L Film.*
108. **Journal of the American Chemical Society** 118(31), 7299-7310 (1996) (with Freyhardt C., Lewis J.E. Jr., Khondabandeh S., Helmkamp M.W., Cambor M.A., Lobo R. F., Pan M., Zones S.I. and Davis M.E.) *VPI-8: A High Silica Zeolite with a Novel "Pinwheel" Building Unit and its Implications for the Synthesis of Extra-Large Pore Molecular Sieves.*
109. **Microporous Materials**, 5, 381-388 (1996)(with Lovallo M. C. and Davis M.E.) *An HREM Study on the Growth of Zeolite L.*
110. **Chemistry of Materials**, 7, 1734-1741 (1995) (with Lovallo M., Okubo T., Davis M.E and Sadakata M.) *Characterization of Zeolite L Nanoclusters.*
111. **J. Chem. Soc. Chem. Commun.**, 227 (1995) (with Yan Y., Gavalas G.R. and Davis M.E.) *Zeolite ZSM-5 Membranes Grown on Porous α -Al₂O₃*
112. **Journal of Catalysis**, 152, 331-340 (1995) (with Ioannides T., Koussathana M. and Verykios X.E.) *Influence of Carrier Doping on the Interaction of Benzene and Toluene with Supported Rhodium.*
113. **Journal of Membrane Science**, 87, 281-296 (1994) (with Gavalas G.R.) *Structure and Aging Characteristics of H₂-permselective SiO₂-Vycor Membranes.*
114. **Journal of Catalysis**, 145, 491-500 (1994) (with Ioannides T., Verykios X.E. and Economou C.) *Effects of Altrivalent Cation Doping on Kinetic Parameters of CO Hydrogenation and CO Oxidation on Supported Rh.*
115. **Applied Catalysis A: General**, 80, 99-113 (1992) (with Koussathana M., Vamvouka N. and Verykios X.E.) *Hydrogenation of Aromatic Compounds over Noble Metals Dispersed on Doped Titania Carrier.*
116. **AIChE Journal**, 38, 6, 847-856 (1992) (with Gavalas G.R.) *A Kinetic Model for Membrane Formation by CVD of SiO₂ and Al₂O₃.*
117. **Industrial and Engineering Chemistry Research**, 30, 2152-2159 (1991) (with Kim S., Nam S.W. and Gavalas G.R.) *Synthesis of Hydrogen Permselective SiO₂, TiO₂, Al₂O₃ and B₂O₃ Membranes from the Chloride Precursors.*
118. **Polymer**, 60, 1861-1866 (1989) (with Tsitsilianis, C. and Economou C.) *Effects of Crystallinity on Aging Phenomenon in Poly(vinyl chloride).*

PROCEEDINGS

119. **Studies in Surface Science and Catalysis** 154, 1160-1167, Part A-C (2004) (with Diaz I., Bonilla G., Lai Z., Terasaki O. and Vlachos D.G.) *Silicalite-1 crystals with modified morphology: HRTEM imaging and synthesis of b-oriented films.*
120. **Studies in Surface Science and Catalysis** 154, 317-324, Part A-C (2004) (with Rimer J.D., Kragten D.D., Lobo R. and Vlachos D.G.) *Growth Mechanisms of Silicalite-1.*

121. **Catalysis Today** 67, 101-107 (2001) (with Bernal M.P. and Xomeritakis G.) *Tubular MFI Zeolite Membranes made by Secondary (Seeded) Growth*.
122. *On the Role of Renucleation and Crystal Incorporation During Secondary Growth of Precursor (Seed) Zeolite Layers* (with Gouzinis A., Boudreau L., Xomeritakis G.) in B.K. Markus, Treacy M.M.J., Higgins J.B. and Bisher M.E. (eds.) "Proceedings of the 12th International Zeolite Conference"
123. *Microstructural Characterization of an Oriented Silicalite Film* (with Lovallo M.C.), in P.Lednor, Ledoux M., Nagaki D. and Thompson L. (eds.) "Advanced Catalytic Materials III", Materials Research Society (Presented in the 1996 Fall MRS Meeting)
124. *Preparation of Supported Zeolite Films and Layers: Processing of Zeolite Suspensions and In Situ Growth from Homogeneous Solutions* (with Lovallo M. and Boudreau L.) in R.F. Lobo, Beck J.S., Suib S.L., Corbin D.R., Davis M.E., Iton L.E. and Zones S.I. (eds.) "Microporous and Macroporous Materials", Materials Research Society, Vol 431 (1996) 225-236 (Presented in the 1996 Spring MRS Meeting)
125. *Continuum and Stochastic Modeling on the Role of Gel Microstructure in Zeolite Crystallization* (with Vlachos D.G.) in R.F. Lobo, Beck J.S., Suib S.L., Corbin D.R., Davis M.E., Iton L.E. and Zones S.I. (eds.) "Microporous and Macroporous Materials", Materials Research Society, Vol 431(1996) (Presented in the 1996 Spring MRS Meeting)
126. *Synthesis and Structure of Ultrafine Zeolite KL (LTL) Crystallites and their Use for Thin Film Zeolite Processing*, (with Okubo T., Lovallo M. and Davis M.E) in Komarneni S., Smith D.M. and Beck J.S. (eds.) "Advances in Porous Materials", Materials Research Society, Vol 371 (1995) 21-26 (Presented in the 1994 Fall MRS Meeting)

BOOK CHAPTERS

127. *Zeolite Films* (with S. Nair) in Auerbach et al. (ed.), "Handbook of Microporous Materials", Marcel Dekker, Inc. (2003) 867-919, Chpt. 17
128. *Chemical Vapor Deposition Membranes* (with Gavalas G.R. and Xomeritakis G.) in N. K. Kanellopoulos (ed.), "Recent Advances in Gas Separation by Microporous Ceramic Membranes", Elsevier (2000) 397-416, Chpt.3.4
129. *Nanocrystalline Zeolites: Synthesis Characterization and Applications with Emphasis on Zeolite L Nanoclusters* (with Lovallo M.C.) in W.M. Moser (ed.), "Advanced Catalysts and Nanostructured Materials", Academic Press (1996) 307-343, Chpt.13

BOOK EDITING

Ordered Nanoporous Solids: Recent Advances and Prospects, Valtchev V., Mintova S., Tsapatsis M. (Editors) Elsevier (2008)

PATENTS

1. "An Improved Method for Forming H₂-permselective Oxide Membranes" Gavalas, G.R., Tsapatsis, M., Nam, S.W. and Kim, S., U.S. Patent 5,453,298 (1995)
2. "Layered Silicate Material and Applications of Layered Silicates with Porous Layers" Tsapatsis, M., Nair, S. and Jeong HW. U.S. Patent 6,863,983 B2 (2006)
3. "Layered Silicate Material and Applications of Layered Silicates with Porous Layers" Tsapatsis, M., Nair, S. and Jeong HW. U.S. Patent 7,087,288 B2 (2006)
4. "Mixed Matrix Membranes" Marand, E., Pechar, T. and Tsapatsis M. U.S. Patent 7,109,140 (2006)
5. "Crystalline Membranes" Tsapatsis, M., Lai, Z., Filed 3/2004; USSN 10/794,483
6. "Biosilica" Tsapatsis M., Davis T.M. and Snyder M. US Patent Provisional Application Filed 10/2006; USSN 60/854,539; US Patent Application filed 10/2007
7. "Novel Microporous Silicate Materials and Methods for Making and Using Same" Tsapatsis M., Choi S. and Coronas J. US Patent Provisional Application Filed 07/17/07, USSN 60/950,258; Regents of the University of Minnesota Ref. No. Z06202; Docket # 600.698PRV; US Patent Filed 7/17/08

8. "Novel Layered Zeolite Materials and Methods for Making and Using Same" Tsapatsis, M., Maheshwari S. and Bates F.S. US Patent Provisional Application Filed 11/05/07 USSN 60/985,551, Regents of the University of Minnesota Ref. No. Z08037; Docket # SLW 600.708PRV

INVITED TALKS

1. University of New York Buffalo 12/3/08
2. Minnesota Nano 11/11-13/08
3. Gordon Research Conference on Membranes (08/10-14/2008)
4. Gordon Research Conference on Catalysis (06/22-26/2008)
5. Gordon Research Conference on Nanoporous Materials (06/15-19/2008)
6. EMCC5 Italy (05/24-29/2008)
7. The Role of Structure in Biological, Chemical and Environmental Separations: From the Molecular to the Macro, Costa Rica (01/6-11/2008) (unable to attend, lecture delivered by J Alex Lee)
8. 2007 ACS Fall Annual Meeting, Boston (Invited Talk) Session in Honor of LE Scriven
9. 2007 ACS Fall Annual Meeting, Boston (Invited Talk) Advanced Materials for Conversions and Separations in Energy Applications
10. 2007 AIChE Annual Meeting, Materials Engineering & Sciences Division Plenary Session (9/07)
11. 2007 Spring MRS Meeting, Symposium R: Transport in Heterogeneous Materials (04/07)
12. Princeton University (11/06)
13. 2006 AIChE Annual Meeting, San Francisco, CA, Session in Honor of Professor Ma (11/06)
14. 2006 AIChE Annual Meeting, San Francisco, CA, Nanoscale Science and Engineering Forum (NSEF) Plenary Session: Chemical Engineering Principles in Nanotechnology (11/06)
15. Merck Sharp and Dohme Lecturer, University of Puerto Rico, Mayaguez (11/06)
16. 2006 Puerto Rico ACS Senior Technical Meeting, Plenary Speaker (11/06)
17. Van Ness Lectures, Rensselaer Polytechnic Institute, Troy, NY (10/06)
18. ZMPC Japan, Keynote Lecturer (unable to attend, lecture delivered by Tracy Davis) (8/06)
19. Distinguished Lecture Series, University of Alberta (4/06)
20. Robert W. Vaughan Lectureship, California Institute of Technology (3/06)
21. Advance Distinguished Lecture, Kansas State University (2/06)
22. PACIFICHEM, Invited Talk (12/05)
23. Stratis V Sotirchos Memorial Lectureship (5/26/05)
24. University of Stocholm (5/12/05)
25. Interfacial Water Workshop, Plenary Speaker, Santa Fe (4/25/05)
26. University of Rochester (3/30/05)
27. ACS Annual Meeting (Invited Talk at Symposium in Honor of ME Davis's Murphree Award) (3/16/05)
28. ACS Annual Meeting (Invited Talk on Nucleation and Growth of Nanostructured Materials) (3/16/05)
29. IGERT Seminar Series, University of Minnesota (9/24/04)
30. Argonne National Lab (8/16/04)
31. International Conference on Inorganic Membranes– Sort Course on Membrane Synthesis (7/18/04)
32. University of Patras, Greece (6/9/04)
33. National Technical University, Athens Greece (7/1/04)
34. UOP/LLC (5/19/04)
35. Ohio State University, Chemical Engineering and Materials Science; IGERT Lecture Series (5/03/04)
36. University of Delaware (2004 Schuit Memorial Lecture) (5/14/04)
37. Pall Corporation (5/13/04)
38. Rice University (4/20/04)
39. Materials Science and Engineering Plenary Session, AIChE Annual Meeting, San Francisco (11/03)
40. ZMPC (Japan) (8/2003) (Conference Canceled)
41. ExxonMobil, Annandale (4/03)
42. Ohio State, Analytical Chemistry (4/03)
43. MIT, Boston (8/02)
44. Gordon Conference on Zeolitic and Layered Materials, Mount Holyoke College, June 16 - 21, 2002
45. Brookhaven National Laboratory (4/02)
46. University of Minnesota (4/02)

47. ExxonMobil, Annandale (2/02)
48. University of California, Davis (10/01)
49. WPI, Worcester (9/01)
50. 2nd International Workshop on Zeolite Membranes, The Netherlands (7/01)
51. City College, New York (2/5/01)
52. University of California, Santa Barbara (1/11/01)
53. Philadelphia Catalysis Club (12/2000)
54. PQ Corporation (12/2000)
55. University of Illinois, Urbana (10/2000)
56. University of Michigan, AnnArbor (10/2000)
57. University of Missouri, Rolla (10/2000)
58. ZMPC Post-Conference: State-of-the-Art in Molecular Sieve Science (8/2000)
59. ZMPC (Japan) (8/2000)
60. Gordon Research Conference on Membranes Materials and Processes (6/2000)
61. University of Texas, Austin (5/2000)
62. University of Cincinnati (5/2000)
63. Purdue University (5/2000)
64. University of Colorado, Boulder (4/2000)
65. General Electric (4/2000)
66. Virginia Polytechnic Institute (4/2000)
67. University of Houston (1/2000)
68. Research Institute of Chemical Engineering, Patras, Greece (12/1999)
69. 1st International Workshop on Zeolite Membranes, Japan (6/98)
70. UCLA, 5/1/98
71. University of Wisconsin (11/99)
72. 1999 Spring MRS Meeting (3/99)
73. University of Washington, Seattle (3/1/99)
74. University of Tokyo 1/21/99
75. North East Corridor Zeolite Association (12/98)
76. Georgia Institute of Technology (10/98)
77. Gordon Research Conference on Separation and Purification (8/98)
78. Gordon Research Conference on Catalysis (6/98)
79. CALTECH, 4/30/98
80. USC, 4/29/98
81. Tufts University, 4/10/98
82. Cornell University, 3/98
83. DOW Chemicals, 2/98
84. Northwestern University, 26/2/98
85. University of Tokyo, 2/9/97
86. ETH Zurich, 4/6/97
87. Gordon Research Conference on Zeolites, Plymouth State College, 6/15-20/97
88. Exxon Research and Engineering Co., New Jersey, 4/9/97
89. Air Products and Chemicals, PA, 11/96
90. Mobil Technology Co., MRCTEC Paulsboro, New Jersey, 10/15/96
91. Amoco Chemicals, Amoco Research Center, Naperville IL, 8/30/96
92. Engelhard Co., New Jersey, 6/15/96
93. 1996 Spring MRS Meeting Session P6: Thin Films and Adsorption, 4/8-12/96, San Francisco, CA

C. GRADUATE STUDENTS AND POST-DOCTORAL FELLOWS

Former Ph.D. Graduate Students:

- Mark C. Lovallo (Ph.D. '98 – EKATO Corporation, USA)
Laura Boudreau (Ph.D. '99 – ChevronTexaco, USA)
Hugh Hillhouse (Ph.D. '01 – Associate Professor, Purdue, USA)
Vladimiro Nikolakis (Ph.D. '01 co-advised with Vlachos–Associate Researcher, FORTH/ICE-HT, Greece)

Sankar Nair (Ph.D. '03 - Assistant Professor, Georgia Tech, USA)
Griselda Bonilla (Ph.D. '04 co-advised with DG Vlachos – IBM, USA)
Scott Fisher (Ph.D. '04 – co-advised with J Watkins – GE Plastics, USA)
Harikrishanan Ramanan (Ph.D. '04 co-advised with Scott Auerbach, Intel Corporation, AZ, USA)
Zhiping Lai (Ph.D. '04, Assistant Professor, Nanyang Technological University, Singapore)
Hae Kwon Jeong (Ph.D. '05, Assistant Professor- Texas A&M University)
John Krohn (Ph.D. '06, -BP, USA)
Tracy Davis (Ph.D. '07, Chevron, USA)
Maybelle Woo (Ph.D. '07, Millipore, USA)
Sunho Choi (Ph.D. '08, Postdoctoral Fellow at GaTech, USA)
Jungkyu Choi (Ph.D. '08, Postdoctoral Fellow at UC Berkeley, USA)

Former MS Graduate Students:

Anastasios Gouzinis (MS '99 – Athens Technology Center, Greece), Khristina Sujaoti (MS' 02- did not pursue employment), Chuan He (MS' 06; employed at government position in China)

Former Post-doctoral Fellows:

Carola Braunbarth (SusTech GmbH & Co., Germany), Neil Fernandes (Accumentrics, USA), George Xomeritakis (Research Assistant Professor, University of New Mexico, USA), Geraldo Nery (Post-doctoral fellow Weisman-Israel), Raman Ravishankar (Atomic Energy Center, India), Isabel Diaz (Tenured Researcher, Instituto de Catálisis, Madrid, Spain), Subhjit Gosh (Halliburton), Tim Drews (OsiSoft, California, USA), George Karanikolos (Demokritos Greece), Stavros Caratzoulas (Post-Doctoral fellow, UDel with D.G. Vlachos), Nick Ergang (Nalco, USA), Mark Snyder (Lehigh University)

Current Research Group at UMN:

Post-Doctoral Fellows:

Wei Fan
Virany Yuwono

Ph.D. Candidates:

Joshua Sheffel
Alex Lee
Sudeep Maheshwari (co-advised with FS Bates)
Rajiv Ranjan
Sandeep Kumar (co-advised with RL Penn)
Damien Douglas Brewer (co-advised with Satish Kumar and Marcio Carvalho)
Jared Andrew Stoeger

1st and 2nd Year Graduate Students:

Pyung-Soo Lee
Hsu Chiang (co-advised with Aditya Bhan; *Bhan is the major advisor*)
Elizabeth Emma Mallon (co-advised with Aditya Bhan)
Anna Ines Torres Ripa (co-advised with Prodromos Daoutidis)
Nicole Lorentzen (co-advised with Efrosini Kokkoli)