

CURRICULUM VITA
MICHEL W. BARSOUM

PERSONAL

Date of Birth: January 1, 1955
Telephone: Office: (215) 895-2338 - FAX: (215) 895-6760
E-Mail: Barsoumw@drexel.edu

EDUCATION

Ph.D. MASSACHUSETTS INSTITUTE OF TECHNOLOGY, June 1985
Degree in Ceramics from Department of Materials Science and Engineering

M.Sc. UNIVERSITY OF MISSOURI-ROLLA, ROLLA, MO. June 1980
Degree in Ceramics Engineering, Department of Ceramic Engineering

B.Sc. AMERICAN UNIVERSITY IN CAIRO, CAIRO, EGYPT February 1977
Department of Materials Engineering; Highest honors.

PROFESSIONAL EXPERIENCE

DREXEL UNIVERSITY, Philadelphia, PA. Sept. 1999-present
Distinguished Professor, Department of Materials Science and Engineering

University of Poitiers, Poitiers, France, June & July 2003
Visiting Professor

MAX-PLANCK INSTITUTE, PML, Stuttgart, Germany Sept. 2000-2001
Sabbatical Leave

DREXEL UNIVERSITY, Philadelphia, PA. Sept. 1997-1999
Professor, Department of Materials Engineering

MAX-PLANCK INSTITUTE, FKF, Stuttgart, Germany Sept. 1993-94
Sabbatical Leave

DREXEL UNIVERSITY, Philadelphia, PA. Sept. 1985-99
Assistant and Associate Professor, Department of Materials Engineering

AWARDS

University Research/Scholarship Award, Drexel University, 2007 (Inaugural award).
Academician, World Academy of Ceramics, 2006.
Fellow, American Ceramic Society, 2005.
Marquis Who's Who in Science and Engineering, 2005-2006 Edition.
Outstanding Service Award, Department of Materials Science and Engineering, 2006.

Outstanding Teaching Award, Department of Materials Science and Engineering, 2005.
Outstanding Research Award, Department of Materials Science and Engineering, 2003.
Visiting Professorship, U. of Poitiers, Poitiers, France, 2003.
Outstanding Research Award, College of Engineering, Drexel University, 2003.
Research Scholar Award, Drexel University, 2001.
Alexander von Humboldt-Max Planck Society Prize for Senior US Scientists, 2000.
Distinguished Professor, Drexel University, 1999.

TEXTBOOKS

Fundamentals of Ceramics, 2nd printing, Institute of Physics, Bristol, UK, 2003.
Fundamentals of Ceramics, (668 pages, 300 illustrations), McGraw Hill, NY, 1997.

PATENTS:

- 1) M. W. Barsoum, "Methods for Densifying and Strengthening Ceramic-Ceramic Composites by Transient Plastic Phase Processing". Patent # 5,451,365 (1997).
- 2) M. W. Barsoum, D. Brodtkin, T. El-Raghy and G. S. Yaroschuk, "Synthesis of H-phase Products", WO 9727965, Issued in 1997.
- 3) M. W. Barsoum and T. El-Raghy, "Process for Making a Dense Ceramic Work-piece." Patent # 5,882,561. Issued in 1999.
- 4) M. W. Barsoum, T. El-Raghy, D. Brodtkin, A. Zavaliangos and S. Kalidindi, "Synthesis of 312 Compounds and Composites Thereof, Patent # 5,942,455. Issued in 1999.
- 5) M. W. Barsoum and T. El-Raghy, "Surface Modification of 312 and Related Materials", Patent # 6,013,322. Issued in 2000.
- 6) R. Knight and M. W. Barsoum, "Corrosion, Oxidation, and/or Wear-Resistant Coatings", U.S. Patent No. 6,231,969. Issued May 2001.
- 7) T. El-Raghy, M. W. Barsoum, M. Sundberg and H. Pettersson, "Process for forming 312 phase materials and process for sintering the same", US Patent # 6,461,989.
- 8) M. Sundberg, K. Lindgren, El-Raghy and M. W. Barsoum, "Method of producing a metal-containing single-phase composition", US Patent # 6,986,873.
- 9) V. Jovic and M. W. Barsoum, "Electrolytic Cell and Electrodes For Use in Electrochemical Processes", US Patent 7,001,494. Issued Feb. 2006.

Pending

- 10) Y. Gogotsi and M. W. Barsoum, "Nanoporous Carbide Derived Carbon with Tunable Pore Size".
- 11) M. W. Barsoum, E. N. Hoffman and R. D. Doherty, "Reduction of Spontaneous Metal Whisker Formation".
- 12) S. Gupta, M. W. Barsoum, C.-W. Li and T. G. Palanisamy, "Ternary Carbide and Nitride Materials Having Tribological Applications and Methods of Making Same", Filed 2005.
- 13) T. G. Palanisamy, S. Gupta, M. W. Barsoum and C.-W. Li, "Ternary Carbide and Nitride Composites having Tribological Applications and Methods of Making Same", Filed 2005.
- 14) Y. Gogotsi, G. Yushin, E.N. Hoffman and M.W. Barsoum, "Process for Producing Nanoporous Carbide Derived Carbon with Large Specific Surface Area".

- 15) M. W. Barsoum and A. Sakulich, "Compositions and Methods for Manufacturing Geopolymeric Concrete".
- 16) S. Basu, P. Finkel, A. Zhou and M. W. Barsoum, "Smart Sensor Based on Nonlinear Elasticity and Ultrasound Attenuation".

INVITED AND REVIEW ARTICLES (Highlighted papers are noteworthy)

1. M. W. Barsoum, "Nanolayered Kinking Nonlinear Elastic Solids", **Handbook of Nanomaterials**, Ed. Y. Gogotsi, CRC Press, 2006.
2. M. W. Barsoum "Physical Properties of the MAX Phases", **Encyclopedia of Materials Science and Technology**, Eds. K. H. J. Buschow, R. W. Cahn, M. C. Flemings, E. J. Kramer, S. Mahajan and P. Veysiere, Elsevier Science, Amsterdam, 2006.
3. M. W. Barsoum and M. Radovic, "Mechanical Properties of the MAX Phases", **Encyclopedia of Materials Science and Technology**, Eds. K. H. J. Buschow, R. W. Cahn, M. C. Flemings, E. J. Kramer, S. Mahajan and P. Veysiere, Elsevier Science, Amsterdam, 2004.
4. M. W. Barsoum and T. El-Raghy, "The MAX Phases: Unique New Carbide and Nitride Materials", **American Scientist**, **89**, 336-345 (2001).
5. M. W. Barsoum, "The $M_{N+1}AX_N$ Phases: A New Class of Solids: Thermodynamically Stable Nanolaminates", **Progress in Solid State Chemistry**, **28**, 201-281 (2000).
6. M. W. Barsoum, T. El-Raghy and M. Radovic, "Ti₃SiC₂: A Layered Machinable Ductile Ceramic", **Inter-ceram**, **49**, 226-233 (2000).
7. M. W. Barsoum, A. Zavaliangos, S. Kalidindi, T. El-Raghy and D. Brodtkin, "Transient Plastic Phase Processing of Ceramic-Ceramic Composites", **JOM**, November 1995, p. 52
8. M. W. Barsoum, "Degradation of Ceramics in Alkali Metal Environments", **Science and Technology of Fast Ion Conductors**, Eds. H. Tuller and M. Balkanski, NATO Advanced Study Institute Series. pp. 241-270 (1989).

REFEREED JOURNAL PAPERS (Highlighted papers are noteworthy)

2007

195. A. Zhou, S. Basu, P. Finkel, G. Friedman and M. W. Barsoum, "Hysteresis in Kinking Nonlinear Elastic Solids and the Preisach-Mayergoyz Model", Sub. for pub.
194. A. Ganguly, S. Lofland, P. Finkel, J. Hettinger and M. W. Barsoum, "Electrical and Thermal Properties of Ti_{n+1}Al(C_{0.5},N_{0.5})_n with n = 1 or 2", Sub. for pub.
193. S. Basu and M. W. Barsoum, "On the Kinking Nonlinear Elastic Response of Mica Single Crystals", Sub. for pub.
192. B. Manoun, O. Leaffer, S. Gupta, E. N. Hoffman, S. K. Saxena, J. Spanier and M. W. Barsoum, "On the compression behavior of Ti₂InC, (Ti_{0.5},Zr_{0.5})₂InC, and M₂SnC (M = Ti, Nb, Hf) to quasi-hydrostatic pressures above 50 GPa", Sub. for pub.
191. B. Manoun, S. Amini, S. Gupta, S. K. Saxena and M. W. Barsoum, "On the Compression Behavior of Cr₂GeC and V₂GeC to Quasi-hydrostatic Pressures of 50 GPa", **J. Phys.: Condens. Matter.**, in press.

190. A. Zhou, S. Basu and M. W. Barsoum, "Kinking Nonlinear Elasticity in Mg", Sub. For pub.
189. S. Gupta, D. Filimonov, V. Zaitsev, T. Palanisamy, T. El-Raghy and M. W. Barsoum, "Study of Tribofilms Formed During Dry Sliding of Ta₂AlC/Ag or Cr₂AlC/Ag Composites Against Ni-based Superalloys and Al₂O₃", Sub. for pub.
188. S Amini, A. Zhou and M. W. Barsoum, "Room Temperature Damping and Compressive Properties of Ti₂AlC/Nanocrystalline Mg Matrix Composites", Sub. for pub.
187. C. Lange, M. W. Barsoum and P. Schaaf, "Towards the Synthesis of MAX Phase Functional Coatings by Pulsed Laser Deposition", Appl. Surface Science, in press.
186. S Amini, A. Zhou and M. W. Barsoum, "Processing and Microstructural Characterization of Ti₂AlC/Nanocrystalline Mg-Matrix Composites", sub. for publication.
185. A. J. Moseson, S. Basu and M. W. Barsoum, "On the Determination of The Effective Zero Point Of Contact For Spherical Nanoindentation", J. Mater. Res., accepted.
184. A. R. Sakulich, E. Anderson and M. W. Barsoum, "Mechanical and Microstructural Characterization of an Alkali Activated Limestone/Slag Concrete." Sub. for pub.
183. E. N. Hoffman, G. Yushin, T. El-Raghy, Y. Gogotsi and M. W. Barsoum, "Micro and Mesoporosity of Carbon Derived from Metal Carbides", Micropor. Macropor. Mater. in press.
182. A. G. Zhou, A. Ganguly and M. W. Barsoum, "Kinking Nonlinear Elastic Deformation of Ti₃AlC₂, Ti₂AlC, Ti₃Al(C_{0.5},N_{0.5})₂ and Ti₂Al(C_{0.5},N_{0.5})", Sub. for pub.
181. A. Ganguly, M. Radovic and M. W. Barsoum, "Phonon Conductivities, Hardness and Elastic Properties of Ti₃Al(C_{0.5},N_{0.5})₂ and Ti₂Al(C_{0.5},N_{0.5})", Sub. for pub.
180. O. D. Leaffer, S. Gupta, M. W. Barsoum, J. E. Spanier, "On the Raman Scattering from Selected M₂AC Compounds", J. Mater. Res., in press.
179. D. Filimonov, S. Gupta, T. Palanisamy and M. W. Barsoum, "Tribological Behavior of Select MAX Phases Against Al₂O₃ at Elevated Temperatures", Sub for pub.
178. M. W. Barsoum and A. Sakulich, "On Silica Nanospheres and the Pyramids of Egypt", Sub. for pub.
177. S. Gupta, D. Filimonov and M. W. Barsoum, "Effect of Surface Pretreatments on Tribological Characteristics between Ta₂AlC/Ag or Cr₂AlC/Ag Composites and Ni-Based Superalloys", Sub. for publication.
176. T. H. Scabarozi, S. Amini, P. Finkel, M. W. Barsoum, W. M. Tambussi, J. D. Hettinger and S. E. Lofland, "Electrical, Thermal, and Elastic Properties of Ti₂SC", Sub. for pub.

175. Z.-M. Sun, H. Hashimoto and M. W. Barsoum, "On the Effect of Environment on the Spontaneous Growth of Lead Whiskers From Commercial Brasses at Room Temperature", *Acta Mater.*, **55**, 3387-3396 (2007).
174. S. Kulkarni, M. Merlini, N. Phatak, S. K. Saxena, G. Artioli, S. Gupta and M. W. Barsoum, "High Temperature Thermal Expansion and Stability of V_2AlC Up to 950 °C", *J. Amer. Cer. Soc.* in print.
173. S. Gupta, D. Filimonov, V. Zaitsev, M. W. Barsoum and T. Palanisamy, "Ambient and 550 °C Tribological Behavior of Select MAX Phases Against Ni-based Superalloys", *Wear*, in print. ARO/ONR
172. A. G. Zhou, S. Basu and M. W. Barsoum, "Kinking Nonlinear Elasticity, Damping and Microyielding of Hexagonal Closed-Packed Metals", *Acta Mater.* in press.
171. S. Gupta, D. Filimonov, T. Palanisamy, T. El-Raghy and M. W. Barsoum, " Ta_2AlC and Cr_2AlC Ag-based Composites - New Solid Lubricant Materials for Use Over a Wide Temperature Range Against Ni-based Superalloys", *Wear*, **262**, 1479-1489 (2007).
170. S. Gupta, S. Amini, D. Filimonov, T. Palanisamy, T. El-Raghy and M. W. Barsoum, "Tribological Behavior of Ti_2SC at Ambient and Elevated Temperatures", *J. Amer. Cer. Soc.* In print.
169. S. Amini, M. W. Barsoum and T. El-Raghy, "Synthesis and Mechanical Properties of Fully Dense Ti_2SC ", *J. Amer. Cer. Soc.*, in print.
168. B. Manoun, F. Zhang, S. K. Saxena, S. Gupta and M. W. Barsoum, "On the Compression Behavior of $(Ti_{0.5}, V_{0.5})_2AlC$ and $(Ti_{0.5}, Nb_{0.5})_2AlC$ to Quasi-Hydrostatic Pressures Above 50 GPa", *J. Phys. Conds. Matter*, **19**, 246215 (8pp) (2007).
167. P. Eklund, A. Murugaiah, J. Emmerlich, Zs. Czigàny, J. Frodelius, M. W. Barsoum, H. Högberg and L. Hultman, "Homoepitaxial Growth of Ti-Si-C MAX-Phase Thin Films on Bulk Ti_3SiC_2 Substrates", *J. Cryst. Growth*, **304**, 264-269 (2007).
166. S. Basu, A. Zhou and M. W. Barsoum, "Spherical Nanoindentations and Kinking Nonlinear Elasticity in $LiNbO_3$ ", Sub. for pub.
165. S. Kulkarni, S. Vennila, N. Phatak, S. K. Saxena, C. S. Zha, T. El-Raghy, M. W. Barsoum, W. Luo and R. Ahuja, "Study of Ti_2SC Under Compression up to 47 GPa", *J. Alloy Compds.* in print.
164. T. H. Scabarozi, P. Eklund, J. Emmerlich, H. Högberg, T. Meehan, J. D. Hettinger, P. Finkel, S. E. Lofland, L. Hultman and M. W. Barsoum, "Weak Electronic Anisotropy in the Layered Nanolaminate Ti_2GeC ", Sub. for pub.
163. S. Basu, M. W. Barsoum, A. D. Williams and T. D. Moustakas, "Spherical Nanoindentations and Deformation Mechanisms in Free-Standing GaN Films", *J. Appl. Phys.*, **100**, 083522 (2007).

162. A. Ganguly, M. W. Barsoum and R. D. Doherty, "Interdiffusion Between Ti_3SiC_2 - Ti_3GeC_2 and Ti_2AlC - Nb_2AlC Diffusion Couples", *J. Amer. Cer. Soc.*, **90**, 2200-2204 (2007).
161. S. Basu and M. W. Barsoum, "On the Use of Spherical Nanoindentations to Determine the Deformation Micromechanics of ZnO Single Crystals", *J. Mater. Res.*, **22**, 2470-2477 (2007).
160. B. Manoun, S. K. Saxena, G. Hug, A. Ganguly, E. N. Hoffman & M. W. Barsoum, "Synthesis and Compressibility of $Ti_3(Al_{1.0}Sn_{0.2})C_2$ and $Ti_3Al(C_{0.5}N_{0.5})_2$ ", *J. Appl. Phys.*, **101**, 113523 (2007).
159. M. K. Drulis, H. Drulis, A. E. Hackemer, A. Ganguly, T. El-Raghy and M. W. Barsoum, "On the Low Temperature Heat Capacities of Ti_2AlN and $Ti_2Al(C_{0.5}N_{0.5})$ ", *J. Alloys Comps.*, **433**, 59-62 (2007).
158. B. Manoun, H. Yang, S. K. Saxena, A. Ganguly, M. W. Barsoum, Z. X. Liu, M. Lachkar, B. El Bali, "Infrared Spectrum and Compressibility of Ti_3GeC_2 to 51 GPa", *J. Alloys Comps.*, **433**, 265-268 (2007).

2006

157. S. Basu, A. Moseson and M. W. Barsoum, "On the Determination of Indentation Stress-Strain Curves Using Spherical Indenters", *J. Mater. Res.*, **21**, 2628-2637 (2006).
156. Z.-M. Sun, and M. W. Barsoum, "Alternate Mechanism for the Spontaneous Formation of Freestanding Ga Nanoribbons on Cr_2GaC Surfaces", *J. Mater. Res.*, **21**, 1629-1631 (2006).
155. S. E. Lofland, J.D. Hettinger, T. Meehan, A. Bryan, P. Finkel, S. Gupta, M.W. Barsoum and G. Hug, "Electron-Phonon Coupling in MAX Phase Carbides" *Phys. Rev. B*, **74**, 174501 (2006).
154. B. Manoun, S. K. Saxena, T. El-Raghy and M. W. Barsoum, "High-Pressure X-ray Diffraction Study of Ta_4AlC_3 ", *Appl. Phys. Letts.*, **88**, 201902 (2006).
153. M. Frackiewicz, A. G. Zhou and M. W. Barsoum, "Mechanical Damping in Porous Ti_3SiC_2 ", *Acta Mater.*, **54**, 5261-5270 (2006). ARO
152. H. Yang, B. Manoun, R.T. Downs, A. Ganguly & M.W. Barsoum: "Crystal Chemistry of the Ternary Layered Carbide, $Ti_3(Si_{0.43}Ge_{0.57})C_2$ ", *J. Phys. Chem. Solids*, **67**, 2512-2516 (2006). NSF
151. M. W. Barsoum, A. Ganguly and G. Hug, "Microstructural Evidence for Reconstituted Limestone Blocks in the Great Pyramids of Egypt", *J. Amer. Cer. Soc.*, **89**, 3788-3796 (2006).
150. S. Gupta, D. Filimonov and M. W. Barsoum, "Isothermal Oxidation of Ta_2AlC in Air", *J. Amer. Cer. Soc.*, **89**, 2974-2976 (2006).

149. V. Jovic, M. W. Barsoum, B. Jovic, A. Ganguly and T. El-Raghy, "Corrosion Behavior of Ti_3GeC_2 and Ti_2AlN in 1 M NaOH", *J. Electrochem. Soc.*, **153**, B238-B243 (2006).
148. M. K. Drulis, H. Drulis, S. Gupta, T. El-Raghy and M. W. Barsoum, "On the Heat Capacities of M_2AlC ($M = Ti, V, Cr$) Ternary Carbides", *J. Appl. Phys.*, **99**, 093502 (2006).
147. S. Basu, M. W. Barsoum and S. R. Kalidindi, "Sapphire: A Kinking Nonlinear Elastic Solid", *J. Appl. Phys.*, **99**, 063501 (2006).
146. V. Jovic, B. Jovic, S. Gupta, T. El-Raghy and M. W. Barsoum, "Corrosion Behavior of Select MAX Phases in NaOH, HCl and H_2SO_4 ", *Corr. Science*, **48**, 4274-4282 (2006).
145. M. Radovic, M. W. Barsoum, A. Ganguly, T. Zhen, P. Finkel, S. R. Kalidindi and E. Lara-Curzio, "On the Elastic Properties and Mechanical Damping of Ti_3SiC_2 , Ti_3GeC_2 , $Ti_3Si_{0.5}Al_{0.5}C_2$ and Ti_2AlC in the 300-1573 K Temperature Range", *Acta Mater.*, **54**, 2757-2767 (2006).
144. G. Yushin, E. N. Hoffman, M. W. Barsoum, Y. Gogotsi, C. A. Howell, S. R. Sandeman, G. J. Phillips, A. W. Lloyd and S. V. Mikhailovsky, "Mesoporous Carbide-Derived Carbon with Porosity Tuned for Efficient Adsorption of Cytokines", *Biomaterials*, **27**, 5755-5762 (2006).
143. S. Gupta, A. Ganguly, D. Filimonov and M. W. Barsoum, "Oxidation of Ti_3GeC_2 and $Ti_3Ge_{0.5}Si_{0.5}C_2$ in Air", *J. Electrochem. Soc.*, **153**, (7) J61-J68 (2006).
142. S. R. Kalidindi, T. Zhen and M. W. Barsoum, "Macroscale Constitutive Modeling of Kinking Nonlinear Elastic Solids", *Mater. Sci. Engin. A* **418**, 95-98 (2006).
141. A. G. Zhou, M. W. Barsoum, S. Basu, S. R. Kalidindi, T. El-Raghy, "Incipient and Regular Kink Bands in Dense and 10 vol. % Porous Ti_2AlC ", *Acta Mater.* **54**, 1631-1639 (2006).
140. S. Gupta, E. N. Hoffman, M. W. Barsoum, "Synthesis and Oxidation of Ti_2InC , Zr_2InC , $(Ti_{0.5}Zr_{0.5})_2InC$ and $(Ti_{0.5}Hf_{0.5})_2InC$ in Air", *J. Alloy Compds.*, **426**, 68-175 (2006).
139. B. Manoun, S. K. Saxena, T. El-Raghy and M. W. Barsoum, "X-ray High-Pressure Study of Ti_2AlN and Ti_2AlC ", *J. Phys. Chem. Solids*, **67**, 2091-2094 (2006).
138. B. Manoun, R. P. Gulve, S. K. Saxena, S. Gupta, M. W. Barsoum and C. S. Zha, "Compression behavior of M_2AlC ($M=Ti, V, Cr, Nb, \text{ and } Ta$) phases to above 50 GPa", *Phys. Rev. B*, **73**, 024110 (2006).

2005

137. Z.-M. Sun, T. Zhen and M. W. Barsoum, "Creep Rupture Induced Silica-Based Nanofibers Formed on Fracture Surfaces of Ti_3SiC_2 ", *J. Mater. Res.*, **20**, 2895-2897 (2005).

136. J. D. Hettinger, S. E. Lofland, P. Finkel, T. Meehan, J. Palma, K. Harrell, S. Gupta, A. Ganguly, T. El-Raghy and M. W. Barsoum, "Elastic, Electrical and Thermal Properties of M_2AlC ($M = Ti, Cr, Nb$ and V) Phases", Phys. Rev. B, 115120, (2005).
135. Z.-M. Sun, S. Gupta, H. Ye and M. W. Barsoum, "Spontaneous Growth of Free-standing Ga Nanoribbons from Cr_2GaC Surfaces", J. Mater. Res., **20**, 2618-2621 (2005).
134. E. Hoffman, M. W. Barsoum, W. Wang, R. D. Doherty and A. Zavaliangos, "On the Spontaneous Growth of Soft Metal Whiskers", IEEE Holm Conf. Proc. 121-126, (2005).
133. Z.-M. Sun, A. Murugaiah, T. Zhen, A. Zhou and M. W. Barsoum, "Microstructure and Mechanical Properties of Porous Ti_3SiC_2 ", Acta Mater., **53**, 4359-4366 (2005).
132. N. Keawprak, Z.-M. Sun, H. Hashimoto and M. W. Barsoum, "Effect of Sintering Temperature on the Thermoelectric Properties of Pulse Discharge Sintered $(Bi_{0.24}Sb_{0.76})Te_3$ Alloy". J. Alloy Comps., **397**, 236-244 (2005)
131. Z. M. Sun, H. Hashimoto, N. Keawprak, A. B. Ma, L. F. Li and M. W. Barsoum, "Effect of Rotary-Die Equal Channel Angular Pressing on the Thermoelectric Properties of a $(Bi,Sb)_{22}Te_3$ Alloy", J. Mater. Res., **20**, 895-903 (2005).
130. B. Manoun, S. K. Saxena, H.-P. Liermann and M. W. Barsoum, "Thermal Expansion of Polycrystalline Ti_3SiC_2 in the 25–1400 °C Temperature Range", J. Amer. Cer. Soc., **88**, 3489-3491 (2005).
129. T. Zhen, M. W. Barsoum and S. R. Kalidindi, "Effects of Temperature, Strain Rate and Grain Size on the Compressive Properties of Ti_3SiC_2 ", Acta Mater. **53** 4163–4171 (2005).
128. T. Zhen, M. W. Barsoum, S. R. Kalidindi, M. Radovic, Z.-M. Sun and T. El-Raghy, "Compressive Creep of Fine and Coarse-Grained Ti_3SiC_2 in Air in the 1100 to 1300 °C Temperature Range in Air", Acta Mater., **53**, 4963-4973 (2005).
127. J. Chmiola, G. Yushin, R. K. Dash, E. Hoffman, J. E. Fischer, M. W. Barsoum & Y. Gogotsi, "Double-Layer Capacitance of Carbide Derived Carbons", Electrochem. Solid State Lettrs. **8**, A357-A360 (2005).
126. B. Manoun, S. K. Saxena and M. W. Barsoum, "High Pressure Study of Ti_4AlN_3 to 55 GPa", Appl. Phys. Letts., **86**, 101906, 2005.
125. M. W. Barsoum, M. Radovic, T. Zhen and P. Finkel, "Dynamic Elastic Hysteretic Solids and Dislocations", Phys. Rev. Lett., **94**, 085501, 2005.
124. M. K. Drulis, A. Czopnik, H. Drulis, J. E. Spanier, A. Ganguly & M. W. Barsoum, "On the Heat Capacity of Ti_3GeC_2 ", Mater. Sci. & Engin. B, **119**, 159-163, 2005.
123. Z.-M. Sun and M. W. Barsoum "Spontaneous Room Temperature Extrusion of Pb Nano-Whiskers from Lead Brass Surfaces", J. Mater. Res., **20**, 1087-1089 (2005).

122. R. S. Kumar, S. Rekhi, A. L. Cornelius and M. W. Barsoum, “Compressibility of Nb₂AsC to 41 GPa”, Appl. Phys. Lett., **86**, 111904 (2005).
121. G. Hug, M. Jaoun and M. W. Barsoum, “XAS, EELS and Full-Potential Augmented Plane Wave Study of the Electronic Structures of Ti₂AlC, Ti₂AlN, Nb₂AlC and (Ti_{0.5},Nb_{0.5})₂AlC”, Phys. Rev. B, **71**, 24105 (2005).
120. M. W. Barsoum, T. Zhen, A. Zhou, S. Basu and S. R. Kalidindi, “Microscale Modeling of Kinking Nonlinear Elastic Solids”, Phys. Rev. B, **71**, 134101 (2005).
119. G. Yushin, E. Hoffman, A. Nikitin, H. Ye, M. W. Barsoum and Y. Gogotsi, “Synthesis of Nanoporous Carbide-Derived Carbon by Chlorination of Titanium Silicon Carbide”, Carbon, **43**, 2075-82 (2005).
118. A. Ganguly, M. W. Barsoum and J. Schuster, “The 1300 °C Isothermal Section in the Ti-In-C Ternary Phase Diagram”, J. Amer. Cer. Soc., **88**, 1290-1296 (2005).
117. E. N. Hoffman, G. Yushin, M. W. Barsoum and Y. Gogotsi, “Synthesis of Carbide-Derived Carbon by Chlorination of Ti₂AlC”, Chem. Mater. **17**, 2317-2322 (2005).
116. A. Souchet, J. Fontaine, M. Belin, T. Le Mogne, J.-L. Loubet and M. W. Barsoum, “Ti₃SiC₂: Tribological Duality”, Tribology Letters, **18**, pp. 341-352 (2005).
115. J. E. Spanier, S. Gupta, M. Amer and M. W. Barsoum, “First-Order Raman Scattering From the M_{n+1}AX_n Phases”, Phys. Rev. B, **71**, 12103, (2005).

2004

114. Z. Wang, S. Zha and M. W. Barsoum, “Compressibility and Pressure Induced Phase Transformation in Ti₃GeC₃”, Appl. Phys. Letters, **85**, 3453-3455 (2004).
113. M. W. Barsoum, E. Hoffman, R. D. Doherty, S. Gupta & A. Zavaliangos, “Driving Force & Mechanism of Spontaneous Metal Whisker Formation”, Phys. Rev. Letts., **93**, 206104 (2004).
112. B. Manoun, S. K. Saxena, H. P. Liermann, R. Gulve, E. L. Hoffman, M. W. Barsoum, S. Zha and G. Hug, “Compression of Zr₂InC to 52 GPa”, Appl. Phys. Lett., **85**, 1514-1516 (2004).
111. P. Finkel, B. Seaman, K. Harrell, J. D. Hettinger, and S. E. Lofland, A. Ganguly, M. W. Barsoum, Z. Sun, S. Li and R. Ahuja, “Low Temperature Elastic, Electronic and Transport Properties of Ti₃Si_{1-x}Ge_xC₂ Solid Solutions”, Phys. Rev. B, **70**, 085104 (2004).
110. M. W. Barsoum, A. Murugaiah, S. R. Kalidindi and T. Zhen, “Kinking Nonlinear Elastic Solids, Nanoindentations and Geology”, Phys. Rev. Letts., **92**, 255508 (2004).

109. A. Murugaiah, A. Souchet, T. El-Raghy, M. Radovic and M. W. Barsoum, "Tape Casting, Pressureless Sintering and Grain Growth in Ti_3SiC_2 Compacts", J. Amer. Cer. Soc., **87**, [4] 550-556 (2004).
108. A. Murugaiah, M. W. Barsoum, S. Kalidindi and T. Zhen, "Spherical Nanoindentations in Ti_3SiC_2 ", J. Mater. Res., **19**, 1139-1148 (2004).
107. S. Gupta and M. W. Barsoum, "Synthesis and Oxidation of V_2AlC and $(Ti_{0.5}V_{0.5})_2AlC$ in Air", J. Electrochem. Soc., **151**, D24-D29 (2004).
106. M. W. Barsoum, A. Murugaiah, S. R. Kalidindi and Y. Gogotsi, "Kink Bands, Nonlinear Elasticity and Nanoindentations in Graphite", Carbon, **42**, 1435-1445 (2004).
105. S. E. Lofland, J. D. Hettinger, K. Harrell, P. Finkel, S. Gupta, M. W. Barsoum & G. Hug "Elastic and Electronic Properties of Select M_2AX Phases", Appl. Phys. Letts., **84**, 508-510 (2004).
104. M. K. Drulis, A. Czopnik, H. Drulis and M. W. Barsoum, "Low Temperature Heat Capacity and Magnetic Susceptibility of Ti_3SiC_2 ", J. Appl. Phys., **95**, 1128-1333 (2004).
103. A. Ganguly, T. Zhen & M. W. Barsoum, "Synthesis and Mechanical Properties of $Ti_3(Si_xGe_{1-x})C_2$ ($x = 0, 0.25, 0.5$) Solid Solutions", J. Alloys Compnds., **376**, 287-295 (2004).
102. B. Manoun, S. K. Saxena, R. Gulve, H. P. Liermann, A. Ganguly, M. W. Barsoum and C. S. Zha, "Compression of $Ti_3Si_{0.5}Ge_{0.5}C_2$ to 53 GPa", Appl. Phys. Lettr., **84**, 2799-2801 (2004).
101. V. D. Jovic and M. W. Barsoum, "Corrosion Behavior and Passive Films Characteristics Formed on Ti, Ti_3SiC_2 and Ti_4AlN_3 in 1 M H_2SO_4 and 1 M HCl Solutions", J. Electrochem. Soc., **151**, B71-B76 (2004).
- 2003**
100. I. J. Jordan, T. Sekine, T. Kobayashi, X. Li, N. N. Thadhani, T. El-Raghy and M. W. Barsoum, "High Pressure Behavior of Titanium-Silicon Carbide, Ti_3SiC_2 ", J. Appl. Phys., **93**, 9639-43 (2003)
99. Y. Gogotsi, A. Nikitin, H. Ye, W. Zhou, J. Fischer, B. Yi, H. Foley and M. W. Barsoum, "Nanoporous Carbide Derived Carbon with Tunable Pore Size", Nature Materials, **2**, 591-594 (2003).
98. S. E. Stolt, H. I. Starnberg and M. W. Barsoum, "Core Level and Valence Band Studies of Layered Ti_3SiC_2 by High Resolution Photoelectron Spectroscopy", J. Phys. Chem. Solids, **64** 2321-2328, (2003).
97. M. Radovic, M. W. Barsoum, T. El-Raghy and S. Wiederhorn, "Tensile Creep of Coarse-Grained (100-300 μm) Ti_3SiC_2 in the 1000-1200 $^{\circ}C$ Temperature Range", J. Alloys Compnds., **361**, 299-312 (2003).

96. P. Finkel, M. W. Barsoum, J. D. Hettinger, S. E. Lofland and H.-I. Yoo, "Low Temperature Transport Properties of the Natural Nanolaminates: Ti_3AlC_2 and Ti_4AlN_3 ". Phys. Rev. B., **67**, 235108 (2003).
95. J. Travaglini, M. W. Barsoum, V. Jovic and T. El-Raghy, "The Corrosion Behavior of Ti_3SiC_2 in Common Acids and NaOH", Corr. Sci., **45**, 1313-1327 (2003).
94. B. J. Kooi, R. J. Poppen, N. J. M. Carvalho, J. Th. M. De Hosson and M. W. Barsoum, " Ti_3SiC_2 : a Damage Tolerant Ceramic Studied with Nano-indentations and Transmission Electron Microscopy", Acta Mater., **51**, 2859-2872 (2003).
93. M. W. Barsoum, L. H. Ho-Duc, M. Radovic and T. El-Raghy, "Long Time Oxidation Study of Ti_3SiC_2 , Ti_3SiC_2/SiC and Ti_3SiC_2/TiC Composites in Air", J. Electrochem. Soc., **150**, B166-175 (2003).
92. I. Salama, T. El-Raghy and M. W. Barsoum, "Oxidation of Nb_2AlC and $(Ti,Nb)_2AlC$ in Air", J. Electrochem. Soc. **150**, C152-158 (2003).
91. M. W. Barsoum, T. Zhen, S. Kalidindi, M. Radovic and A. Murugaiah, "Fully Reversible, Dislocation-Based Compressive Deformation of Ti_3SiC_2 up to 1 GPa", Nature Materials, **2**, 107-111 (2003).
90. L. H. Ho-Duc, T. El-Raghy and M. W. Barsoum, "Synthesis and Mechanical Properties of Ti_3SiC_2/SiC and Ti_3SiC_2/TiC Composites", J. Alloys Compds., **350**, 303-312 (2003).
89. S. Chakraborty, T. El-Raghy and M. W. Barsoum, "Oxidation of Hf_2SnC and Nb_2SnC in Air in the 400-600°C Temperature Range", Oxid. Metals, **59**, 83-96 (2003).

2002

88. I. Salama, T. El-Raghy and M. W. Barsoum, "Synthesis and Mechanical Properties of Nb_2AlC and $(Ti,Nb)_2AlC$ ", J. Alloys Compds. **347**, 271-278 (2002).
87. M. W. Barsoum, I. Salama, T. El-Raghy, J. Golczewski, W. D. Porter, H. Wang, H. Seifert and F. Aldinger, "Thermal and Electrical Properties of Nb_2AlC , $(Ti,Nb)_2AlC$ and Ti_2AlC ", Met. Mater. Trans., **33A**, 2775-2779 (2002).
86. M. W. Barsoum, A. Ganguly, H. Seifert and F. Aldinger, "The 1300 °C Isothermal Section in the Nb-Sn-C Ternary Phase Diagram", J. Alloys Compds. **337**, 202-207 (2002).
85. M. W. Barsoum, J. Golczewski, H. Seifert and F. Aldinger "Fabrication, Electric and Thermal Properties of Ti_2InC , Hf_2InC and $(Ti,Hf)_2InC$ ", J. Alloy Compds., **340**, 173-179 (2002).

84. M. Radovic, M. W. Barsoum, T. El-Raghy, S. Wiederhorn and W. Luecke, "Effect of Temperature, Strain Rate and Grain Size on the Mechanical Response of Ti_3SiC_2 in Tension", Acta Mater., **50**, 1297-1306 (2002).
83. P. Finkel, J. Hettinger, S. E. Lofland, M. W. Barsoum and T. El-Raghy, "Magnetotransport Properties of the Ternary Carbide, Ti_3SiC_2 : Hall Effect, Magnetoresistance & Magnetic Susceptibility of Ti_3SiC_2 in the 4-300 K Range", Phys. Rev. B, **65**, 035113 (2002).
82. M. W. Barsoum, A. Crossley and S. Myhra, "Crystal-Chemistry from XPS Analysis of Carbide-derived $M_{n+1}AX_n$ ($n = 1$) Nanolaminate Compounds", J. Phys. Chem. Solids. **63**, 2063-2068 (2002).

2001

81. M. Radovic, M. W. Barsoum, T. El-Raghy and S. Wiederhorn, "Tensile Creep of Fine-Grained ($3-5 \mu m$) Ti_3SiC_2 in the 1000-1200 °C Temperature Range", Acta Mater., **49**, 4103-4112 (2001).
80. M. W. Barsoum, N. Tzenov, A. Procopio, T. El-Raghy and M. Ali, "Oxidation of $Ti_{n+1}AlX_n$ where $n = 1-3$ and X is C, N, Part II: Experimental Results", J. Electrochem. Soc., **148**, (8) C551-C562 (2001).
79. M. W. Barsoum, "Oxidation of $Ti_{n+1}AlX_n$ where $n = 1-3$ and X is C, N, Part I: Model", J. Electrochem. Soc., **148**, (8) C544-C550 (2001).
78. M. W. Barsoum, M. Radovic, P. Finkel and T. El-Raghy, " Ti_3SiC_2 and Ice", Appl. Phys. Lett., **79**, 479-481 (2001).
77. T. El-Raghy, M. W. Barsoum and M. Sika, "Reaction of Al with Ti_3SiC_2 in the 800–1000 °C Temperature Range", Mater Sci. Eng. A, **298**, 174-178 (2001).
76. S. Myhra, J. A. A. Crossley and M. W. Barsoum, "Crystal-Chemistry of the Ti_3AlC_2 and Ti_4AlN_3 Layered Carbide/Nitride Phases-Characterization by XPS", J. Phys. Chem. Solids, **62**, 811-817 (2001).
75. Y. Kuroda, I. M. Low, M. W. Barsoum, and T. El-Raghy, "Indentation Responses and Damage Characteristics of Hot Isostatically Pressed Ti_3SiC_2 ", J. Aust. Ceram. Soc., **37**, 95-102 (2001).
74. D. Chen, K. Shirato, M. W. Barsoum, T. El-Raghy & R. O. Ritchie, "High-Temp. Cyclic Fatigue-Crack Growth in Monolithic Ti_3SiC_2 Ceramics", J. Amer. Cer. Soc., **84**, 2914 (2001).

2000

73. M. W. Barsoum, H.-I. Yoo, I. K. Polushina, V. Yu. Rud', Yu. V. Rud' and T. El-Raghy, "Electrical Conductivity, Thermopower and Hall effect of Ti_3AlC_2 , Ti_4AlN_3 and Ti_3SiC_2 ", Phys. Rev. B, **52**, 10194-10198 (2000).

72. M. W. Barsoum, T. El-Raghy, W. D. Porter, H. Wang, J. C. Ho and S. Chakraborty, "Thermal Properties of Nb₂SnC", J. Appl. Phys., **88**, 6316 (2000).
71. T. El-Raghy, S. Chakraborty and M. W. Barsoum, "Synthesis and Characterization of Hf₂PbC, Zr₂PbC and M₂SnC (M = Ti, Hf, Nb or Zr)", J. Europ. Cer. Soc., **20**, 2619-2625 (2000).
70. M. W. Barsoum, C. J. Rawn, T. El-Raghy, A. Procopio, W. D. Porter, H. Wang, and C. R. Hubbard, "Thermal Properties of Ti₄AlN₃", J. Appl. Phys., **87**, 8407-14 (2000).
69. C. J. Rawn, M. W. Barsoum, T. El-Raghy, A. Procopio and C. M. Hoffmann, "Structure of Ti₄AlN_{3-x}", Mater. Res. Bulletin, **35**, 1785-1796 (2000).
68. H.-I. Yoo, M. W. Barsoum and T. El-Raghy, "Ti₃SiC₂: A Material With Negligible Thermopower Over an Extended Temperature Range", Nature, **407**, 581-582 (2000).
67. C. J. Rawn, E. A. Payzant, C. R. Hubbard, M. W. Barsoum and T. El-Raghy, "Structure of Ti₃SiC₂", European Powder Diffraction, **321-3**: 889-892, Parts 1& 2 (2000).
66. C. J. Gilbert, D. R. Bloyer, M. W. Barsoum, T. El-Raghy, A. P. Tomsia, and R. O. Ritchie, "Fatigue-Crack Growth and Fracture Properties of Coarse and Fine-Grained Ti₃SiC₂", Scripta Mater. **42**, 761-767 (2000).
65. M. Y. Gamarnik, M. W. Barsoum and T. El-Raghy, "Improved X-ray Powder Diffraction Data for Ti₂AlN", Powder Diffraction, **15**, (4) 241-242 (2000).
64. T. El-Raghy, P. Blau and M. W. Barsoum, "Effect of Grain Size on Friction and Wear Behavior of Ti₃SiC₂", Wear, **238**, 125-130 (2000).
63. M. W. Barsoum, M. Ali and T. El-Raghy, "Processing and Characterization of Ti₂AlC, Ti₂AlN and Ti₂AlC_{0.5}N_{0.5}", Met. Mater. Trans., **31A**, 1857-65 (2000).
62. N. Tzenov and M. W. Barsoum, "Synthesis and Characterization of Ti₃AlC_{1.8}", J. Amer. Cer. Soc., **83**, 825-832 (2000).
61. N. Tzenov, M. W. Barsoum and T. El-Raghy, "Influence of Small Amounts of Fe, V and Cu on the Synthesis and Stability of Ti₃SiC₂", J. Europ. Cer. Soc. **20**, 801-806 (2000).
60. M. Radovic, M. W. Barsoum, T. El-Raghy, J. Seidensticker and S. Wiederhorn, "Tensile Properties of Ti₃SiC₂ in the 25-1300 °C Temperature Range", Acta Mater. **48**, 453-459 (2000).
59. A. T. Procopio, M. W. Barsoum and T. El-Raghy, "Characterization of Ti₄AlN₃", Met. Mater. Trans., **31A**, 333 (2000).
58. A. T. Procopio, T. El-Raghy and M. W. Barsoum, "Synthesis of Ti₄AlN₃ and Phase Equilibria in the Ti-Al-N System", Met. Mater. Trans., **31A**, 373 (2000).

57. P. Finkel, M. W. Barsoum, T. El-Raghy, "Low Temperature Dependencies of the Elastic Properties of $Ti_3Al_{1.1}C_{1.8}$, Ti_4AlN_3 and Ti_3SiC_2 ", J. Appl. Phys. **87**, 1701-3 (2000).

1999

56. M. W. Barsoum, L. Farber, I. Levin, A. Procopio, T. El-Raghy and A. Berner, "HRTEM of Ti_4AlN_3 ; or $Ti_3Al_2N_2$ Revisited", J. Amer. Cer. Soc., **82**, 2545-2547 (1999).

55. M. W. Barsoum, T. El-Raghy, L. Farber, M. Amer, R. Christini and A. Adams, "The Topotaxial Transformation of Ti_3SiC_2 To Form a Partially Ordered Cubic $TiC_{0.67}$ Phase by the Diffusion of Si into Molten Cryolite", J. Electrochem. Soc., **146**, 3919-3923 (1999).

54. J. C. Ho, H. H. Hamdeh, M. W. Barsoum and T. El-Raghy, "Low Temperature Heat Capacities of $Ti_3Al_{1.1}C_{1.8}$, Ti_4AlN_3 and Ti_3SiC_2 ", J. Appl. Phys., **86**, 3609-3611 (1999).

53. T. El-Raghy and M. W. Barsoum, "Growing Metallic Whiskers: An Alternative Interpretation", Science, **284**, 1355 (1999).

52. L. Farber and M. W. Barsoum, "Isothermal Sections in the Cr-Ga-N System in the 650-1000 °C Temperature Range", J. Mater. Res., **14**, 2560-2566 (1999).

51. M. W. Barsoum and L. Farber, "Room Temperature De-Intercalation and Self-Extrusion of Ga from Cr_2GaN ", Science, **284**, 937-939 (1999).

50. J. C. Ho, H. H. Hamdeh, M. W. Barsoum and T. El-Raghy, "Low Temperature Heat Capacity of Ti_3SiC_2 ", J. Appl. Phys., **85**, 7970-7971 (1999).

49. P. Finkel, M. W. Barsoum and T. El-Raghy, "Temperature Dependence of Elastic Properties of Ti_3SiC_2 ", J. Appl. Phys., **85**, 7123-7126 (1999).

48. M. W. Barsoum, L. Farber, T. El-Raghy and I. Levin, "Dislocations, Kink Bands and Room Temperature Plasticity of Ti_3SiC_2 ", Met. Mater. Trans., **30A**, 1727-1738 (1999).

47. T. El-Raghy, M. W. Barsoum, A. Zavaliangos and S. Kalidindi, "Processing and Mechanical Properties of Ti_3SiC_2 , Part II: Mechanical Properties", J. Amer. Cer. Soc., **82**, 2855-2859 (1999).

46. T. El-Raghy & M. W. Barsoum, "Processing and Mechanical Properties of Ti_3SiC_2 : Part I: Reaction Path and Microstructure Evolution", J. Amer. Cer. Soc., **82**, 2849-54 (1999).

45. S. M. El-Raghy, A. F. Waheed, T. S. El-Raghy and M. W. Barsoum, "Preliminary Report on the Electrochemical Behavior of Ti_3SiC_2 ", J. Mat. Sci. Lett., **18**, 519-520 (1999).

44. D. Brodtkin, A. Zavaliangos, S. Kalidindi and M. W. Barsoum, "Room and High Temperature Properties of Titanium Carbide-Titanium Boride Composites Fabricated by Transient Plastic Phase Processing", J. Amer. Cer. Soc., **82**, 665-72 (1999).

43. L. Farber, I. Levin and M. W. Barsoum, "HRTEM Study of a Low-Angle Boundary in Plastically Deformed Ti_3SiC_2 ", Phil. Mag. Letters, 79, 163 (1999).
42. M. Gamarnik and M. W. Barsoum, "Bond Lengths in the Ternary Compounds Ti_3SiC_2 , Ti_3GeC_2 and Ti_2GeC ", J. Mater. Science, 34, 169-174 (1999).
41. M. W. Barsoum, T. El-Raghy, C. J. Rawn, W. D. Porter, H. Wang, A. Payzant and C. Hubbard, "Thermal Properties of Ti_3SiC_2 ", J. Phys. Chem. Solids, 60, 429-439, (1999).
40. M. W. Barsoum and T. El-Raghy, "Room Temperature Ductile Carbides", Met. Mater. Trans., 30A, 363-369 (1999).

1998

39. M. Amer, M. W. Barsoum, T. El-Raghy, I. Wiess, S. LeClair and D. Liptak, "Raman Spectrum of Ti_3SiC_2 ", J. Appl. Phys., 84, 5817-5819 (1998).
38. E. H. Kisi, J. A. Crossley, S. Myhra and M. W. Barsoum, "Structure and Crystal-Chemistry of Ti_3SiC_2 ", J. Phys. Chem. Solids, 59, 1437-1443 (1998).
37. L. Farber, M. W. Barsoum, A. Zavaliangos, T. El-Raghy and I. Levin, "Dislocations and Stacking Faults in Ti_3SiC_2 ", J. Amer. Cer. Soc., 81, 1677-81 (1998).
36. M. W. Barsoum and J. C. Schuster, "Comment on 'New Ternary Nitride in the Ti-Al-N System'", J. Amer. Cer. Soc., 81, 785-86 (1998).
35. I. M. Low, S. K. Lee, B. Lawn and M. W. Barsoum, "Contact Damage Accumulation in Ti_3SiC_2 ", J. Amer. Cer. Soc., 81, 225-28 (1998).
34. T. El-Raghy and M. W. Barsoum, "Diffusion Kinetics of the Carburization and Silicidation of Ti_3SiC_2 ", J. Appl. Phys., 83, 112-19, (1998).

1997

33. H. J. Schluter, M. W. Barsoum and J. Maier, "Kinetic Studies of Oxygen Incorporation in $SrTiO_3$ by Permeation Experiments", Solid State Ionics, 101, 509-515, Part I, (1997).
32. M. W. Barsoum, G. Yaroshuck and S. Tyagi, "Fabrication and Characterization of M_2SnC ($M = Ti, Zr, Hf$ and Nb), Scrip. Mater., 37, 1583-1591 (1997).
31. M. W. Barsoum and T. El-Raghy, "A Progress Report on Ti_3SiC_2 , Ti_3GeC_2 and the H-Phases, M_2BX ", J. Mater. Synthesis and Processing, 5, 197-216 (1997).
30. M. W. Barsoum, T. El-Raghy and L. Ogbuji, "Oxidation of Ti_3SiC_2 in Air", J. Electrochem. Soc., 144, 2508-2516 (1997).

29. T. El-Raghy, A. Zavaliangos, M. W. Barsoum and S. Kalidindi, "Damage Mechanisms Around Hardness Indentations in Ti_3SiC_2 ", J. Amer. Cer. Soc., **80**, 513-516, (1997).
28. M. W. Barsoum, D. Brodtkin and T. El-Raghy, "Layered Machinable Ceramics For High Temperature Applications", Scrip. Mater., **36**, 535-541, (1997).

1996

27. A. Elkind and M. W. Barsoum, "Strength Degradation of SiC Monofilaments as Result of Grain Growth at High Temperatures", J. Mater. Sci., **31**, 6119-6123 (1996).
26. M. W. Barsoum and T. El-Raghy, "Synthesis and Characterization of a Remarkable Ceramic: Ti_3SiC_2 ", J. Amer. Cer. Soc., **79**, 1953-56 (1996). **With 272 citations this paper was the most cited paper in the J. Amer. Cer. Soc. in the decade spanning 1994 to 2004.**
25. D. Brodtkin, S. Kalidindi, M. W. Barsoum and A. Zavaliangos, "Microstructural Evolution During Transient Plastic Phase Processing of Titanium Carbide-Titanium Boride Composites", J. Amer. Cer. Soc., **79**, [7], 1945-52 (1996).
24. D. Brodtkin and M. W. Barsoum, "Isothermal Section of the Ti-B-C Phase Diagram at 1600 °C", J. Amer. Cer. Soc., **79**, [3] 785-87 (1996).
23. M. W. Barsoum, A. Elkind and F. Selim, "Low Breakdown Voltage Varistors by Grain Boundary Diffusion of Molten Bi_2O_3 in ZnO", J. Amer. Cer. Soc., **79**, 962-66 (1996).

1995

22. M. W. Barsoum and A. Elkind, "Effect of Viscous Flow on Thermal Residual Stresses in SiC Borosilicate Composites", J. Mater. Sci., **30**, 69-74 (1995).

1993

21. M. W. Barsoum & B. Houg, "Transient Plastic Phase Processing of Ti-B-C Composites", J. Amer. Cer. Soc., **76**, 1445-51 (1993).
20. A. Elkind, M. W. Barsoum and P. Kangutkar, "Thermal Expansion of SiC Monofilaments and SiC Borosilicate Composites", J. Amer. Cer. Soc., **75**, 2871-73 (1992).
19. M. W. Barsoum, I.-C. Tung and H. M. Chou, "Effect of Oxidation on Single-Fiber Pullout Interfacial Shear Stresses in the SiC-Borosilicate Glass System", J. Amer. Cer. Soc., **74**, 2693-96 (1991).
18. A. S. D. Wang, X. G. Huang and M. W. Barsoum, "Matrix Crack Initiation in Ceramic Matrix Composites; Part II. Models and Simulation Results", *ibid.* pp. 271-282.
17. M. W. Barsoum, P. Kangutkar and A. S. D. Wang, "Matrix Crack Initiation in Ceramic Matrix Composites; Part I. Experimental and Test Results", Comp. Sci. and Technology, **44**, 257-270 (1992).

16. M. W. Barsoum, P. Kangutkar and M.J. Koczak, "Nitridation Kinetics and Thermodynamics of Silicon Powder Compacts", J. Amer. Cer. Soc., **74**, [6], 1248-1253 (1991).
15. J. Chou, M. W. Barsoum and M.J. Koczak, "Effect of Temperature on Interface Bonding of SiC-Glass Single-Fiber Specimens", J. Mater. Sci., **26**, 1216-1222 (1991).
14. H. D. Merchant, J.G. Morris and M. W. Barsoum, "Strain Age Strengthening of Aluminum Alloys", Aluminum, **67**, 275-281 (1991).
13. M. W. Barsoum, "Critical Review of the Thermodynamics of the Na-Al-O System", J. Mater. Science, **25**, 4393-4400, (1990).
12. A. Nath, S. Nagy, M. W. Barsoum, S. Tyagi and Y. Wen, "A Microprobe for the Cu(1) Site in $Y_1Ba_2Cu_3O_y$: Emission Mossbauer Studies Using Carrier-Free Cobalt-57", Solid State Comm., **68**, 181-184, (1988).
11. S. Tyagi and M. W. Barsoum, "Low -Field Microwave Absorption in YBaCuO- a Possible Device Application", Supercond. Sci. Technol. **1**, 20-23, (1988).
10. S. Tyagi, M. W. Barsoum, K.V. Rao & N. Karpe, "Non-Resonant Microwave Absorption: A Microprobe to Superconductivity in $Y_1Ba_2Cu_3O_{7-x}$ ", J. de Physique, **C8-2229** (1988).
9. S. Tyagi, M. W. Barsoum and K.V. Rao, "Low-Field Microwave Absorption and Flux Quantization in $Y_1Ba_2Cu_3O_y$ ", J. Phys. C: Solid State Phys. **21**, L827-L833, (1988).
8. S. Tyagi, M. W. Barsoum, K.V. Rao and V. Skumryev, "Low Field ac-Susceptibility and Micro-wave Absorption in YBaCuO and BiCaSrCuO Superconductors", Physica C, **156**, 73 (1988).
7. S. Tyagi, M. Barsoum & K.V. Rao, "Electron Spin Resonance in $Y_1Ba_2Cu_3O_y$ ", Phys. Letters A. 128, 225-227 (1988).
6. M. W. Barsoum and O. Zhou, "Microcracking in Ceramic/Ceramic Composites", Adv. Ceram. Mater., **3**, 361-68 (1988).
5. M. W. Barsoum, D. Patten and S. Tyagi, "The Use of the Meissner Effect to Separate, Purify and Classify Superconducting Powders", App. Phys. Lett., **51**, pp. 1954-56, (1987).
4. M. W. Barsoum and H. L. Tuller, "Thermodynamics of Molten Li-Sn Alloys", Met. Trans. A, **19A**, pp. 637-644, (1988).
3. M. W. Barsoum and H. Tuller, "In-Situ Determination of the Kinetics of Reaction between Li & Fast-Ion Conducting Lithium Borate Glasses", Solid State Ionics, **18 & 19**, 338 (1986).
2. H. L. Tuller and M. W. Barsoum, "Glass Solid Electrolytes-Past, Present and Near Future", J. Non-Cryst. Solids, **Invited Paper**, **73**, 331-350 (1985).

1. M. A. El Said, M.W. Barsoum, M. H. Ishaq and H. D. Merchant, "Effect of Sb, Sn and Pb on the Recrystallization of Bismuth", J. Less Comm. Metals, **58**, 133 (1978).

FULL TEXT CONFERENCE PAPERS

1. M. W. Barsoum, M. Velez, H.L. Tuller and D. R. Uhlmann, "Reactions at Alkali Metal-Glass Interfaces", in *Surfaces and Interfaces in Ceramic and Ceramic-Metal Systems*. Eds. J. Pask and A. Evans, Plenum Publishing Co. (1981) p. 567.
2. M. W. Barsoum and P.D. Ownby, "The Effect of Oxygen Partial Pressure on the Wetting of SiC, AlN and Si₃N₄ by Si and a Method to Calculate the Surface Energies Involved", *ibid*, p. 457.
3. H. L. Tuller and M. W. Barsoum, "Electrolytic Control and Detection of Ionic Species Using Fast-Ion Conducting Glasses", *Proceedings of the Int. Conf. on Solid State Transducers*, Philadelphia, PA, IEEE Press, 1985. Invited Paper, p. 256.
4. M. W. Barsoum, D. Patten and S. Tyagi, "Magnetic Separation of High Tc Powders", *Ceramic Superconductors II*, M. F. Yan, Ed. Amer. Cer. Soc.(1988).pp.554-562.
5. S. Nagy, M. W. Barsoum, S. Tyagi and A. Nath, "Emission Mossbauer Studies of Y₁Ba₂O₃O_{7- \square} Using Carrier Free Cobalt-57", *Proc. First Asia-Pacific Conference on Condensed Matter Phys.*, 27 June- 3 July 1988, Singapore.
6. M. W. Barsoum, P. Kangutkar & M.J. Koczak, " Nitridation Mechanisms of Si Powder Compacts", *Proceedings of the 13th Annual Conference on Composites and Advanced Ceramics*, Amer. Cer. Soc., Coco Beach, Fl. Jan. 1989. pp. 794-806.
7. A. Wang, M. W. Barsoum & M.W. Huang, "Matrix Cracking Initiation in Brittle Matrix Composites: Experiment and Predictions", *Proceed. Amer. Soc. for Composites Symposium on High Temperature Composites*, Dayton, Ohio, June 13-15, 166-175 (1989).
8. M. W. Barsoum, B. Plotnick & A. Wang, "Matrix Cracking Stresses in Uniaxially Fiber Reinforced Ceramic Matrix Composites", *Proceedings of 7th CIMTEC World Congress*, Montecatini, Italy, June 1990.
9. M. W. Barsoum, J. Medoff, P. Kumar & R. Hard, "Calcination, Sintering and Transport Critical Currents of a Co-Precipitated Y₁Ba₂O₃O_{7-x} Powder", in *High Temperature Superconductors*, Ed. P. Vincenzini, Elsevier Science Pubs., pp. 673-680 (1991).
10. P. Kangutkar, M. W. Barsoum and A. Wang, "In Situ Observation of Damage Initiation and Evolution in Unidirectional Ceramic Matrix Composites", *Proceedings of 1st Canadian International Composites Conference*. Sept. 4-6, Montreal, 1991. pp. 594-600.
11. D. Brodtkin, M. W. Barsoum, A. Zavaliangos, and S. Kalidindi, "Cost Effective Fabrication of Ultra-refractory Ceramic-Ceramic Composites by Transient Plastic Phase Processing", *Proc. of the 1995 NSF Design and Manufacturing Grantees Conf.*, SME, p. 519, 1995.
12. D. Brodtkin, M. W. Barsoum, A. Zavaliangos and S. Kalidindi, "Processing-Structure-Properties Relations in Titanium-Boron-Carbon Ceramic Composites Produced by Transient Plastic Phase Processing", *Cer. Eng. & Sci. Proc.*, July 1994.
13. D. Brodtkin, M. W. Barsoum, A. Zavaliangos and S. Kalidindi, "Processing-Structure-Property Relations in Ceramic-Ceramic Composites Manufactured by Transient Plastic Phase Processing", *Ceramic Engineering and Science Proc.*, **15**, pp. 121-130, 1994.
14. D. Brodtkin, A. Zavaliangos, S. Kalidindi and M. W. Barsoum, "Transient Plastic Phase Processing Of Titanium Carbide-Titanium Boride Composites: Reaction Paths And Microstructural Evolution", *Proceedings, 9th Technical Conference on Composite Materials*, pp. 55-62, University of Delaware, September 1994.
15. D. Brodtkin, S. Kalidindi, M. W. Barsoum & A. Zavaliangos, "Reaction Paths and Micro-Structural Evolution During Transient Plastic Phase Processing of Titanium Carbide-Titanium Boride Composites", *Proc. of TMS Winter Meeting*, Las Vegas, Feb. 1995. Eds. E. Barrera, F. Marquis, W. Frazier, S. Fishman, N. Thadani and Z. Munir, TMS, 13-24 Warrendale, 1995.
16. D. Brodtkin, A. Zavaliangos, S. Kalidindi & M. W. Barsoum, "Microstructural Optimization and Mechanical Properties of Titanium Carbide-Titanium Boride Composites Fabricated by Transient Plastic Phase Processing". *Processing and Fabrication of Advanced Materials IV*, T.S. Srivatsan and J.J. Moore (Eds.), pp. 189-198, TMS, Warrendale, PA 1996.

17. **(Invited Paper)** D. Brodtkin, A. Zavaliangos, S. Kalidindi & M. W. Barsoum, "Transient Plastic Phase Processing Of TiC-Titanium Boride Composites: Reaction Paths & Micro-structural Evolution", Proc. Inter. Conf. in Composites Engin., p. 585, New Orleans, 1994.
18. T. El-Raghy, A. Zavaliangos, M. W. Barsoum & S. Kalidindi, "Synthesis & Characterization of Ti_3SiC_2 and $Ti_3SiC_2/TiC/SiC$ Composites", Proc. of ASM Fall Meet., Cinn. OH, Oct. 1996.
19. M. W. Barsoum and T. El-Raghy, "Ternary Carbide of Titanium and Silicon", Advanced Materials and Processes, **152**, [7] 51-52, 1997.
20. C. J. Rawn, E. A. Payzant, C. R. Hubbard, M. W. Barsoum and T. El-Raghy, Structure of Ti_3SiC_2 , To appear in Materials Science Forum.
21. T. El-Raghy, M. Amer, M. W. Barsoum & I. Weiss, "Functionally Graded Joints for C/C Composites", 44th Int. SAMPE Symp. & Exhibition, Long Beach CA, May 1999.
22. C. J. Rawn, E.A. Payzant, C.R. Hubbard, M.W. Barsoum, and T. El-Raghy, "Structure of Ti_3SiC_2 ", EPDIC-6 – Proc. 6th Europ. Powder Diffraction Conf. [R. Delhez & E.J. Mittemeijer, eds.], Materials Science Forum vol. 321-324, Trans Tech Pub., Zürich, Switzerland, pp. 889-892 (2000).
23. K. Shirato, D. Chen, M. W. Barsoum, T. El-Raghy and R. O. Ritchie, "High Temperature Cyclic Fatigue Crack Growth in Monolithic Ti_3SiC_2 Ceramics", Proc. TMS Fall 2000.
24. Y. Kuroda, I. M. Low, B. H. O'Connor, M. W. Barsoum and T. El-Raghy, "Effect of grain size on the preferred grain orientations in Ti_3SiC_2 ", pp. 1473-1476 in Proc. 2000 Powder Metallurgy World Congress (Eds. K. Kosuge & H. Nagai), Nov. 2000, Kyoto, Japan.
25. I. M. Low, M. Singh, P. Manurung, E. Wren, D. P. Sheppard, M.W. Barsoum, "Depth profiling of phase composition and texture in layered-graded Al_2O_3 - & Ti_3SiC_2 -based systems using X-ray and synchrotron radiation diffraction", HIGH-PERFORMANCE CERAMICS 2001, PROC. KEY ENGINEERING MATERIALS 224-2: 505-510, 2002.
26. A. Souchet, J. Fontaine, M. Belin, T. Le Mogne, J-L. Loubet and M. W. Barsoum, "Dual Tribological Behavior of a Nanolayered Ceramic: Ti_3SiC_2 ", Proceedings of Spring 2003 MRS Meeting, San Francisco, CA.

MONOGRAPHS

M.J. Koczak, K. Prewo, A. Mortensen, S. Fishman, M. W. Barsoum & R. Gottschall, "Inorganic Composite Materials in Japan: Status and Trends", ONR Research Scientific Bull., Nov. 1989.

PRESENTATIONS

Invited Talks:

107. Gordon Research Conf., High Temperature Corrosion; New London, NH; Oxid. of MAX.
106. Los Alamos National Lab., Los Alamos, NM, April 2007; MAX phases talk.
105. Laval University, Quebec City, Canada, May 2007, Pyramid talk.
104. Inter. Cement Microscopy Assoc. Conference, Quebec City, Canada, May 2007, Open debate on whether cast blocks were used in construction of the Pyramids of Egypt.
103. 6th Adv. Workshop on Engin. Ceramics in Smolenice Castle, Slovakia, May 2007. KNE talk
102. 6th Adv. Workshop on Engin. Ceram, Smolenice Castle, Slovakia, May 2007. Pyramid talk
101. Los Alamos National Lab., Los Alamos, NM, April 2007; Nanoindentation talk.
100. Los Alamos National Lab., Los Alamos, NM, April 2007; Kinking Nonlin. Elastic Talk
99. Los Alamos National Laboratory, Los Alamos, NM, April 2007. Pyramid Talk
98. Texas A&M, College Station, TX, March 2007. Pyramid Talk
97. Texas A&M, College Station, TX, March 2007, Kinking Nonlinear Elastic Solids Talk.
96. International Center of Diffraction Data, Newtown Square, PA March 2007, Pyramid Talk.
95. Keynote speaker, National Consortium of Specialized Secondary Schools of Math, Science, and Technology, Drexel University, March 2007. Pyramid Talk.
94. John Hopkins University, Baltimore, MD, March 2007. Kinking Nonlin. Elastic Solids Talk

93. Drexel University, Engineering New Frontiers Lecture, February 2007. Pyramid Talk
92. Columbia University, Geology Department, New York, January 2007. Pyramid Talk
91. MS&T Fall 2006 Meeting, Cincinnati, OH (two different invited talks).
90. Frontiers in Materials Research Workshop, Center for Advanced Interdisciplinary Research, Vina del Mar, Chile, Oct. 2006.
89. University of Gottingen, Gottingen, Germany, July 2006.
88. CIMTEC, Italy, June 2006.
87. Oak Ridge National Laboratory, Oak Ridge, TN, April 21, 2006. Pyramid Talk.
86. Oak Ridge National Laboratory, Oak Ridge, TN, April 19, 2006.
85. Drexel University, Department of Materials Science and Engineering, April 2006.
84. CEA, Saclay, France, March 2006.
83. AVS International Symposium, Boston, USA, October 30th to November 4th, 2005.
82. ONERA, Paris, September 2005.
81. SMEC Conf., Florida International University, Miami, FL, April 2005.
80. Caterpillar, Technology & Solutions Division, Peoria, IL, January, 2005
79. 29th Annual Cocoa Beach Meeting, Jan. 23-28, 2005, Cocoa Beach, FL
78. NIST, Gaithersburg, MD, December 2004.
77. IBM, Poughkeepsie, New York, December 2004.
76. DOE Workshop on Ceramics Ductilization, Santa Fe, NM, November 2004.
75. Abardeen Proving Grounds, ARL, Abardeen, MD, October 2004.
74. CNRS/Ecole Centrale de Lyon, Lyon, France, September 18, 2004.
73. CNRS/Ecole Centrale de Lyon, Lyon, France, September 16, 2004.
72. University of Grenoble, Grenoble, France, September 14, 2004.
71. Polish Academy of Sciences, Wroclaw, Poland, May 2004.
70. Uppsala University, Uppsala, Sweden, May 2004.
69. Virginia Tech. University, Blacksburg, VA, March 2004.
68. Seoul National University, Seoul, S. Korea, Oct. 2003.
67. 1st International Symposium on Nanostructured Materials, Seoul, S. Korea, Oct. 2003.
66. University of Poitiers, Poitiers, France, July 2003.
65. Rutgers University, New Brunswick, March 2003.
64. Oak Ridge National Laboratory, Oak Ridge, TN, Feb. 2003
63. ONERA, Paris, France, June 2002
62. University of Poitiers, Poitiers, France, June 2002
61. CNRS/Ecole Centrale de Lyon, Lyon, France, June, 2002.
60. GE Aircraft Engines, Cincinnati, OH May 2002.
59. University of Missouri-Rolla, Rolla, MO, April. 2002.
58. AIST, Sendai, Japan, March, 2002
57. Tohoku University, Sendai, Japan, March 2002
56. Cerratec Inc., Sendai, Japan, March, 2002
55. Drexel University, Phila., PA, Feb. 2002.
54. U. of Pennsylvania, Phila. PA. Oct. 2001.
53. U. of Maryland, College Park, MD, Sept. 2001.
52. Naval Research Lab., Wash. DC. , Sept. 2001.
51. Technische Univ. Clausthal, Clausthal, Germany, June 2001.
50. U. of Hamburg, Hamburg, Germany, June 2001.
49. U. of Ulm, Ulm, Germany, May 2001.
48. AEA Technology, Oxford, England , April 2001.

47. Uppsala Univ., Uppsala, Sweden, Workshop on Experimental and Theoretical Studies of Designer Materials, April 2001.
46. Oxford University, Oxford, England, April 2001.
45. U. of Karlsruhe, March 2001.
44. Federal Instit. of Tech., Lausanne, Switzerland, Feb. 2001
Technical Univ. of Eindhoven, Netherland, Feb. 2001
43. U. of Groningen, Holland, Feb. 2001
42. Max-Planck Institute, Stuttgart, Germany, Dec. 2000.
41. ABB Corp., Sweden, Dec. 2000.
40. Uppsala University, Sweden, Dec. 2000
39. Linkoping University, Sweden, Dec. 2000.
38. Hilti Corp., Lichtenstein, Dec. 2000.
37. Chalmers University of Tech., Sweden, Dec. 2000
36. Kanthal Corp., Sweden, Dec. 2000
35. Univ. of Vienna, Austria, Nov. 2000.
34. Ecole Centrale de Lyon, France, Nov. 2000.
33. Polytech. Institut. Milano, Italy, Nov. 2000.
32. El-Tech Corp., Cleveland, OH, July 2000.
31. Brush-Wellman, Cleveland, OH, Feb. 2000.
30. University of Illinois-Chicago, Chicago, IL, April 2000.
29. Praxair, Indianapolis IN, Oct. 1999.
28. Black and Decker, Towson, MD, Oct. 1999.
27. Oak Ridge National Lab., Oak Ridge, TN, Oct. 1998.
26. TMS Fall Meeting, Chicago, Ill, Oct. 1998.
25. AMP Incorporated, Harrisburg, PA, June 1998.
24. University of Illinois, Urbana, Ill, April 1998.
23. Symposium on "Innovative Processing and Synthesis of Ceramics, Glasses, and Composites", 100th Annual Meeting of the American Ceramic Society in Cincinnati, OH, May 3-6, 1998.
22. Vesuvius Research Pittsburgh, PA, Feb. 1998.
21. ALCOA Tech. Center, Pittsburgh, PA, Feb. 1998.
20. National Institute for Standards and Technology, Gaithersburg, MD. September 1997.
19. Cabot Corporation, Boyertown, PA, Sept. 1996.
18. Wright-Patterson AFB, Dayton, OH, July 1996.
17. M. W. Kellogg, Houston, TX, July 1996.
16. ART, Buffalo, NY, May 1996.
15. University Of Penn, Phila., PA, May 1996.
14. Norton-Saint Gobain, Northboro, MA, April 1996.
13. Drexel University, Phila, PA, Feb. 1996.
12. GE Corporate Research and Development, Schenectady, N.Y., January 1996.
11. Max-Planck Institute Pulver Metallurgisches Laboratorium, Stuttgart, Germany, "Role of Silicon Oxynitride During Nitridation of Si Powders in Nitrogen, June 1994.
10. Max-Planck Institute Fur Festkorperforschung, Stuttgart, Germany, "Reduction Kinetics and Electrical Conductivity in Lead-Disilicate Based Glasses", May 1994.
9. NASA-Lewis Research Center, Cleveland, OH, "Fiber-Reinforced Ceramic Matrix Composites", February 1993.

8. Penn State, State College, Department of Materials Science and Engineering, "Transient Plastic Phase Processing of Ceramics", February 1993.
7. Purdue University, Lafayette, In., Department of Materials Engineering, "Transient Plastic Phase Processing of Ceramic Composites", November 1992.
6. Princeton University Plasma Physics Lab. Lecture Series, "Sun Dragon: The Making of a Solar Car", January 1992, Princeton, NJ
5. TMS Fall Meeting, "In-situ Processing of Ceramic/Ceramic Composites by Solid/Solid Reactions", October 8-11, 1991, Cincinnati, Ohio.
4. American Chemical Society (Education Division), "Glass Matrix Composites: Processing and Properties", August 1990, Wash., D.C.
3. Rutgers University, Piscataway, NJ, "Fiber-Reinforced Ceramics: Theory vs. Expt.", Oct. 1989.
2. Tokyo Institute of Technology, Tokyo, Japan, Sept. 1988, "Matrix Cracking in Uniaxially Reinforced Ceramic Matrix Composites".
1. NATO Advanced Study Institute on the Science and Technology of Fast Ion Conductors, Erice, Italy July 1-15, 1987, "Degradation of Ceramics in Alkali Metal Environments".

Presentations and Posters: (person presenting is in bold letters)

107th Annual Meeting American Ceramic Society, April, 2005, Baltimore, MD, "Joining of $M_{n+1}AX_n$ Phases at Elevated Temperatures", **A. Ganguly**, M. W. Barsoum and R. D. Doherty.

107th Annual Meeting American Ceramic Society, April, 2005, Baltimore, MD, "Low Temperature Elastic and Electronic Properties of $Ti_3Si_{1-x}(Ge/Al)_xC_2$ and $Ti_2AlCyN(1-y)$ Solid Solutions", **A. Ganguly**, M. W. Barsoum, P. Finkel, J. Hettinger, S. Lofland, K. Harrell, Z. Sun, S. Ali & R. Ahuja.

107th Annual Meeting of the American Ceramic Society, Apr. 10-13, 2005, Baltimore, MD, "Theory of Kinking Nonlinear Elastic Solids", **A. Zhou**, M. W. Barsoum, T. Zhen, Z. M. Sun, S. R. Kalidindi

ECS: 207th Meeting "Carbon Nanotubes and Nanostructures: Fundamental Properties and Processes", Oral Pres. **J. Chmiola**, G. Yushin, R. Dash, E. Hoffman, J. Fischer, M. W. Barsoum and Y. Gogotsi.

29th Annual Cocoa Beach Meeting, Jan. 23-28, 2005, Cocoa Beach, FL, "Tribological Properties of MAX phase", with **S. Gupta**, Z.M. Sun, A. Ganguly, T. Palanisamy, E. Passman and C. W. Li

29th Annual Cocoa Beach Meeting, Jan. 23-28, 2005, Cocoa Beach, FL, Synthesis and Consolidation of Single-Phase Ternary Compound Ti_3SiC_2 via Pulse Discharge Sintering (PDS), with **Z. M. Sun**, M. W. Barsoum, H. Hashimoto, and Z. F. Zhang. (Poster).

29th Annual Cocoa Beach Meeting, Jan. 23-28, 2005, Cocoa Beach, FL, "Mechanical and Damping Properties of Porous Ti_3SiC_2 ", with **Z. M. Sun**, A. Zhou, T. Zhen, A. Murugaiah, M. W. Barsoum and T. El-Raghy.

29th Inter. Conf. on Advanced Ceramics and Composites, Amer. Ceram. Soc., Jan 23-28, 2005, Cocoa Beach, FL, “Nanoindentations in Ceramic Single Crystals”, **S. Basu**, A. Murugaiah, Z. Sun, S. R. Kalidindi and M. W. Barsoum.

29th Inter. Conf. on Advanced Ceramics and Composites, Ceramic Society, Jan 23-28, 2005, Cocoa Beach, FL, “Nanoindentations in Sapphire Single Crystals”, **S. Basu**, A. Murugaiah, Z. Sun, S. R. Kalidindi and M. W. Barsoum.

MRS Meeting Fall 2004, “First Order Raman Scattering from MAX Phases”, Oral Presentation: **J. S. Spanier**, S. Gupta and M. W. Barsoum.

MRS Meeting Fall 2004, “Effect of Al additions on the synthesis of single-phase Ti_3SiC_2 ”
Poster with **Z. M. Sun**, S. L. Yang, H. Hashimoto and M. W. Barsoum

MRS Meeting Fall 2004, "Growth Model and Observations of Soft Metal Whiskers", Oral Presentation : **E. N. Hoffman**, M. W. Barsoum, R. D. Doherty, and A. Zavaliangos.

MRS Meeting Fall 2004, “Ductile Machinable Ternary Carbides and Nitrides: A New Class of Solids”, M. W. Barsoum.

MRS Meeting Fall 2004, "Tribological and Wear Studies of MAX Phases and Its Composites", Oral Presentation: **S. Gupta**, Z. M. Sun, M. W. Barsoum, T. Palanisamy, E. Passman and C. W. Li.

MRS Meeting Fall 2004, “Kinking Nonlinear Elastic Solids & Spherical Nanoindentations”, Oral Presentation, **M. W. Barsoum**, A. Murugaiah, T. Zhen, S. Basu and S. R. Kalidindi.

MRS Meeting Fall 2004, “Spherical Nanoindentations in Mica, Graphite and Sapphire”, Oral Presentation: **S. Basu**, A. Murugaiah, M. W. Barsoum, Z. M. Sun, S. R. Kalidindi and Y. Gogotsi.

ECS, 203rd Meeting, Paris, France. “Synthesis and Oxidation of Cr_2AlC and V_2AlC in Air”, by S. Gupta and **M. W. Barsoum**,

ECS, 203rd Meeting, Paris, France. “Oxidation of $Ti_{n+1}AlX_n$ where $n = 1-3$ and X is C and/or N”, by **M. W. Barsoum**, N. Tzenov, A. Procopio, T. El-Raghy and M. Ali

ECS, 203rd Meeting, Paris, France. “Long Time Oxidation Study Of Ti_3SiC_2 , Ti_3SiC_2/SiC and Ti_3SiC_2/TiC Composites in Air, by **M. W. Barsoum**, L. H. Ho-Duc, M. Radovic and T. El-Raghy.

ACers, 105th Annual Meeting, Nashville, TN, “Nanoindentation of a Natural Nanolaminate Material: Ti_3SiC_2 ”, by **A. Murugaiah**, M. W. Barsoum, S. R. Kalidindi, T. Zhen and Y. Gogotsi.

ACers, 105th Annual Meeting, Nashville, TN, “Synthesis and Oxidation Kinetics of Cr_2AlC in Air”, by **S. Gupta** and M. W. Barsoum.

ACers, 105th Annual Meeting, Nashville, TN, “Synthesis and Oxidation kinetics of V_2AlC and $(Ti,V)_2AlC$ in Air”, by **S. Gupta** and M. W. Barsoum.

ACers, 105th Annual Meeting, Nashville, TN, “The 1300 °C Isothermal Sections in the Nb-Sn-C and Ti-In-C Ternary Phase Diagrams”, by **A. Ganguly**, M. Barsoum and F. Aldinger.

ACers, 105th Annual Meeting, Nashville, TN, “Nanolaminates, Kink Bands and Fully Reversible Dislocation-Based Deformation Up to 1 GPa in Ti_3SiC_2 ”, by **T. Zhen**, M. W. Barsoum, S. Kalidindi, M. Radovic and A. Murugaiah

MRS Meeting Spring 2003, “Fully Reversible Dislocation-Based Deformation in a Nanolayered Carbide: Ti_3SiC_2 ”, by **M. Barsoum**, T. Zhen, S. Kalidindi and A. Murugaiah.

MRS Meeting Spring 2003, “Deformation Processes During Nanoindentation of Ti_3SiC_2 ”, Poster with A. Murugaiah, **M. W. Barsoum**, S. Kalidindi, and T. Zhen.

MRS Meeting Spring 2003, “Dual Tribological Behavior of a Nanolayered Ceramic: Ti_3SiC_2 ”, Poster with **A. Souchet**, J. Fontaine, M. Belin, T. Le Mogne, J-L. Loubet and M. W. Barsoum.

SMEC Conf., Florida International University, March 2003, Miami, FL, “Nanoindentation of A Natural Nanolaminate: Ti_3SiC_2 M. W. Barsoum, A. Murugaiah, S. R. Kalidindi, T. Zhen and Y. Gogotsi.

APS March Meeting, Texas, 2003. “Low Temperature Transport Properties of the Natural Nanolaminates: Ti_3AlC_2 and Ti_4AlN_3 ”, with P. **Finkel**, J.D. Hettinger, S.E. Lofland.

APS March Meeting, Texas, 2003, “Low Temperature Electrical and Thermal Transport Properties of the Natural Nanolaminate V_2AlC ”. With J. D. Hettinger, P. **Finkel**, S. E. Lofland and S. Gupta.

Gordon Research Conference, Aug. 2001, “Deformation and Rupture of Ti_3SiC_2 During Tensile Creep in the 1000-1200°C Temperature Range”, Poster with **M. Radovic**, T. El-Raghy and S. Wiederhorn

23rd Annual Cocoa Beach Meeting, Jan. 25-29, 1999, Cocoa Beach, FL, “Compression Creep Behavior of Ti_3SiC_2 in the 1000-1200 °C Temperature Range” with **T. El-Raghy**, B. Tiberio, A. Zavaliangos.

Centennial Meeting of APS, March 20-26, Atlanta GA, “Temperature Dependence of the Elastic Properties of Ti_3SiC_2 ”, Bulletin of American Physical Society, **44**, No.2, 1999, with **P. Finkel** and T. El-Raghy.

23rd Annual Cocoa Beach Meeting, Jan. 25-29, 1999, Cocoa Beach, FL, “Thermal Properties of Ti_3SiC_2 ”, with T. El-Raghy, C. Rawn, A. Payzant and C. Hubbard.

23rd Annual Cocoa Beach Meeting, Jan. 25-29, 1999, Cocoa Beach, FL, “Room Temperature Ductile Carbides”, with T. El-Raghy

99th Annual Meeting of the Amer. Cer. Soc., May 4-7, 1997, Cinn., OH, "Effect of Microstructure on Room and Elevated Temperature Mechanical Properties of Ti_3SiC_2 " with T. El-Raghy. C-005-97.

99th Annual Meeting of the Amer. Cer. Soc., May 4-7, 1997, Cinn., OH, "Surface Treatment of Ti_3SiC_2 ", with T. El-Raghy. C-006-97.

99th Annual Meeting of the Amer. Cer. Soc., May 4-7, 1997, Cinn., OH, "Oxidation of Ti_3SiC_2 in Air", with T. El-Raghy and L. Ogbuji. C-007-97.

99th Annual Meeting of the Amer. Cer. Soc., May 4-7, 1997, Cinn., OH, "Polycrystalline Nanolaminates", with T. El-Raghy. C-008-97.

21st Annual Cocoa Beach Conference on Composites and Advanced Ceramics, Jan. 12-16, 1997, Cocoa Beach, Fl., "Polycrystalline Nanolaminates, Ti_3SiC_2 , Ti_3GeC_2 & the H-phases", with T. El-Raghy

21st Annual Cocoa Beach Conference on Composites and Advanced Ceramics, Jan. 12-16, 1997, Cocoa Beach, Fl., "Reaction Path and Microstructure-Property Relationships in Ti_3SiC_2 ", with T. El-Raghy

21st Annual Cocoa Beach Conference on Composites and Advanced Ceramics, Jan. 12-16, 1997, Cocoa Beach, Fl., "Functionally Graded Ti_3SiC_2 Materials", with T. El-Raghy

1996 MRS Fall Meeting, Dec. 2-6, Boston, MA, "Polycrystalline Nanolaminates, Ti_3SiC_2 , Ti_3GeC_2 & the H-phases", with T. El-Raghy. V10.10

1996 MRS Fall Meeting, Dec. 2-6, 1996, Boston, MA, "Effect of Interplanar Debonding on the Properties of Ti_3SiC_2 and the H-phases", with T. El-Raghy. W12.10

98th Annual Meeting of the Amer. Cer. Soc., April 14-18, 1996, Indianapolis, IN, " Ti_3SiC_2 & Other Truly Remarkable Ceramics", with T. El-Raghy.

98th Annual Meeting of the Amer. Cer. Soc., April 14-18, 1996, Indianapolis, IN, "Transient Plastic Phase Processing of Ceramic/Ceramic Composites and their Properties", with A. Zavalangos, S. Kalidindi and D. Brodtkin

98th Annual Meeting of Amer. Cer. Soc., April 14-18, 1996, Indianapolis, IN, "Processing of Fully Dense Single Phase Ti_3SiC_2 and Ti_3SiC_2 -TiC Composites", with T. El-Raghy.

95th Annual Meeting of the Amer. Cer. Soc., April 18-22, 1993, Minneapolis, MN, "A Novel Technique to Measure Axial Thermal Residual Strains and Critical Lengths of Ceramic Fibers and Whiskers", with A. Elkind. SII-78-93.

95th Annual Meeting of the Amer. Cer. Soc., April 18-22, 1993, Minneapolis, MN., "Transient Plastic Phase Processing of Ultra-Refractory Composites".

95th Annual Meeting of the Amer. Cer. Soc., April 18-22, 1993, Minneapolis, MN., "Role of Oxynitride Formation During Nitridation of Si Powders in Nitrogen", with T. Parker. SX-10-93

1992 MRS Fall Meeting, "Thermodynamics and Kinetics of Nitridation of Si Powders in Nitrogen", with T. Parker, K2.4.

1992 World Metallurgy World Congress, June 21-26, San Francisco, CA "Formation of TiC and TiB₂ Composites",

94th Annual Meeting of the Amer. Cer. Soc., April 12-16, 1992, Minneapolis, MN, "Low Voltage-High Current Density ZnO Varistors", with A. Elkind and F. Selim. 16-E-92.

94th Annual Meeting of the Amer. Cer. Soc., April 12-16, 1992, Minneapolis, MN, "Matrix Cracking in Uniaxially Fiber-Reinforced Ceramic Matrix Composites:, Part I. Effect of Matrices", with P. Kangutkar and A. S. D. Wang. 38-SII-92.

94th Annual Meeting of the Amer. Cer. Soc., April 12-16, 1992, Minneapolis, MN., "Matrix Cracking in Uniaxially Fiber-Reinforced Ceramic Matrix Composites:, Part II. Effect of Fiber diameter, Residual Stresses and Interfacial Bonding", with P. Kangutkar & A. S. D. Wang.

93rd Annual Meeting of Amer. Cer. Soc., April 28-May 2, 1991, Cincinnati, OH, "Reduction Kinetics of Lead Silicate Based Glasses", with S. Kumar, A. Then and W. Tasker.

93rd Annual Meeting of the American Ceramic Society, April 28-May 2, 1991, Cincinnati, OH, "Effect of Temperature and Environment on the Interfacial Shear Strengths Between SiC and Glass" with I. Tung and H.M. Chou.

93rd Annual Meeting of the American Ceramic Society, April 28-May 2, 1991, Cincinnati, OH., "Reactive Sintering and Forging of In Situ Formed, Fully Dense TiB₂/TiC Composites", with B. Houg and R. Sands.

93rd Annual Meeting of the American Ceramic Society, April 28-May 2, 1991, Cincinnati, OH., "Matrix Cracking in Fiber-Reinforced Ceramic Matrix Composites", with P. Kangutkar.

7th CIMTEC World Congress, Montecatini, Italy, June 1990."Matrix Cracking Stresses in Uniaxially Fiber Reinforced Ceramic Matrix Composites", with P. Kangutkar & A. S. Wang.

92nd Annual Meeting of the American Ceramic Society, April 22-26, 1990, Dallas, TX., "Effect of Temperature and Fabrication Environments on Interfacial Shear Strengths in SiC Fiber-Glass Composites", with F. Ardite and H. Chou (62-SIV-90)

91th Annual Meeting of the American Ceramic Society, May 1-5, 1989, Indianapolis, In., "Matrix Cracking Stresses in Uniaxially Fiber Reinforced Ceramic Composites", (71-SI-89)

13th Annual Conference on Composites and Advanced Ceramics, Jan. 15-18, 1989. Cocoa Beach, Fl., "Reaction Mechanisms During Nitridation of Silicon Powder", with P. Kanguktar & M.J. Koczak. (38-C-89F).

4th Annual Northeast Meeting, Processing and Applications of High Tc Superconductors: Status and Prospects, May 9-11, Rutgers University, New Brunswick, NJ. Co-sponsors Met. Soc., MRS and ASM. "Effect of Magnetic field on Separation and Classification of Superconducting Powders", with S. Tyagi.

90th Annual Meeting of the American Ceramic Society, May 1-5, 1988, Cincinnati, OH., "Lithium Ceramic Interactions", with B. Bae. (217-B-88)

90th Annual Meeting of the American Ceramic Society, May 1-5, 1988, Cincinnati, OH "Microcracking in Ceramic Composites", with S. Holder and S. Freiman. (26-C-88)

90th Annual Meeting of the Amer. Ceram. Soc., May 1988, Cincinnati, OH, "Use of the Meissner Effect to Separate, Purify and Classify Superconducting Powders", with D. Patten and S. Tyagi. (68-SII-88).

89th Annual Meeting of the American Ceramic Society, April 30, 1987, Pittsburg, PA., "Microcracking in Ceramic/Ceramic Composites", with Z. Zhou. (49-C-87)

171st Meeting of the Electrochemical Society, May 10-15, 1987. Philadelphia, Pa. "Thermodynamics and Kinetics of Li/Ceramic Interactions", with K. Pytlewski.

5th International Conf. on Solid State Ionics, Aug. 18-24, 1985, Lake Tahoe, CA. "In Situ Determination of the Reactions Between Li and Fast Ion Conducting Glasses", with H. Tuller.

TEACHING

Undergraduate:

- E-848 Fundamentals of Ceramics
- E-880 Electronic Properties of Materials
- E-801 Fundamentals of Materials
- E-831 Thermodynamics of Materials Processing

Graduate:

- G-823 Structure and Properties of Ceramics and Electronic Materials
- G-880 Special Topics: "Modern Electrochemistry"
- G-880 Special Topics: "Processing of High Performance Ceramics".
- G-880 Special Topics: "Structure and Properties of Ceramics, Part II.
- G-580 Introduction to Solid State Materials.

PUBLIC SERVICE

Participated NSF sponsored workshop: Fundamental Research Needs in Ceramics, held in Arlington, D.C. on June 10-11, 1997.

Committee Membership

Phase Equilibria Program, Amer. Cer. Soc., 1997-2000.

Peer Reviewer

Journals: Nature, J. Amer. Cer. Soc., J. Europ. Cer. Soc., Materials Science and Engin., J. Applied Physics, Applied Physics Letters, Acta and Scripta Mater., Tribological Letters., Phys. Rev. B.

Proposals: National Science Foundation, STCU.

STUDENTS SUPERVISED

PHD's

- 91 P. Kangutkar, "Matrix Fracture Mechanisms in Fiber Reinforced Ceramic Composites".
- 94 S. Kumar, "Reduction Kinetics and Electrical Conductivity in Lead-Disilicate Glasses".
- 96 D. Brodtkin "Transient Plastic Phase Processing of Ti-B-C Composites & their Properties"
- 97 T. El Raghy, "Processing and Characterization of Ti_3SiC_2 ", with A. Zavaliangos and S. Kalidindi.
- 00 C. Wilkinson Mager, "Development of a Zirconi Toughened Hydroxyapatite", with L. Shadler.
- 01 M. Radovic, "Effect of Temperature and Microstructure of Tensile and Tensile Creep Properties of Ti_3SiC_2 in Air". With T. El-Raghy.
- 04 A. Murugaiah, "Nanoindentations in Kinking Nonlinear Elastic Solids", with S. Kalidindi.
- 04 T. Zhen, "Compressive Behavior of Kinking Nonlinear Elastic Solids - Ti_3SiC_2 , Graphite, Mica and BN", with S. Kalidindi.
- 06 A. Ganguly, "Synthesis and Characterization of MAX Phase Solid Solutions".
- 06 S. Gupta, "Tribology of MAX Phase and Their Composites".
- 06 E. Hoffman, "Carbide Derived Carbon from MAX-Phases and their Separation Applications", with Y. Gogotsi
- 07 S. Basu, "Characterization of Kinking Nonlinear Solids", with S. Kalidindi.

- 08 A. Zhou, "Modeling of Kinking Nonlinear Solids", with S. Kalidindi.
- 08 S. Amini, "Synthesis and Characterization of Ti_2SC "
- 08 T. Scabarozi, "MAX Thin Films; Synthesis and Characterization",
- 09 A. Sackulich, "Ancient Egyptian Inspired Cements and Concretes".
- 09 A. Moseson, "Earth Cements and their Applications".

MASTERS

- 88 B. Bae, "Interactions of Lithium with Lithium Borates".
- 89 P. Kangutkar, " Processing of Reaction Bonded Silicon Nitride", with M. Koczak.
- 90 J. Medoff, "Processing/Property Relationships in $Y_1Ba_2Cu_3O_{7-x}$ ".
- 90 S. Liou, "Ceramic Thermal Barrier Coatings on Graphite Epoxy Composites", with R. Smith
- 91 B. Houg, "Transient Plastic Phase Processing of Ti-B-C Composites".
- 92 T. Lien, "ZrC/ZrB₂ Composites Processed by Reaction Hot Pressing"
- 93 T. Parker, "Thermodynamics and Kinetics of the Nitridation of Si Powders in N₂"
- 93 P. Ciccone, "The Design and Fabrication of Sudragon IV".
- 98 S. Chakraborty, "Processing and Characterization of Some H-phases", with T. El-Raghy.
- 99 M. Ali, "Processing and Characterization of Ti_2AlC , $Ti_2AlC_{0.5}N_{0.5}$ and Ti_2AlN ", with T. El-Raghy
- 99 A. Procopio, "Synthesis and Characterization of Ti_4AlN_3 ", with T. El-Raghy.
- 01 I. Salama, "Synthesis and Characterization of the Ternary Carbides Nb_2AlC and $(Ti,Nb)_2AlC$. with T. El-Raghy.
- 02 J. Travaglini, "Corrosion Behavior of Ti_3SiC_2 "
- 02 L. Ho-Duc, "Synthesis and Characterization of the Properties of Ti_3SiC_2/SiC and Ti_3SiC_2/TiC Composites.
- 07 A. Moseson, "Nanoindentation of Metals and Ceramics".

