

Publication list of Hsin Wang:

Updated January 24, 2003

Papers

- 1 Li, H., J. Lee, M. R. Libera, W. Y. Lee, A. Kebbede, M. J. Lance, H. Wang, G. N. Morscher, "Morphological Evolution and Weak Interface Development within Chemical Vapor Deposited-Zirconia Coating Deposited on Hi-Nicalon Fiber," *J. Am. Ceram. Soc.*, vol.85, no.6, 2002 pp.1561-68 .
- 2 K. Jagannadham and **H. Wang**, "Thermal Resistance of Interfaces in AlN-diamond Thin Film Composites", *J. Appl. Phys.* 91(3)1224-1235 Feb. (2002)
- 3 Y. Jennifer Su, R.W. Trice, K.T. Faber, **H. Wang** and W.D. Porter, "Thermal Conductivity, Phase Stability, and Oxidation Resistance of Y₃Al₅O₁₂/Y₂O₃-ZrO₂ (YSZ) Thermal Barrier Coatings", submitted to *Oxidation of Metals*, April (2002)
- 4 **H. Wang**, J. G. Hemerick, R.B. Dinwiddie and M.K. Ferber, "Thermal Conductivity of Savaged Fusion Cast Alumina Used in Glass Industry", *Thermal Conductivity* 26, (2002)
- 5 S. Raghavan, **H. Wang**, R. B. Dinwiddie, W. D. Porter, R. Vaßen, D. Stöver, and M. J. Mayo, "Ta₂O₅/Nb₂O₅ and Y₂O₃ Co-doped Zirconias for Thermal Barrier Coatings", submitted to *J. Am Ceram. Soc.*, 2002
- 6 **H. Wang** and R. B. Dinwiddie H. Maleki, J. Oglesbee and C. Thongsouk, "IR Imaging of Integrated Circuit Transistors during Operation", *SPIE THERMOSENSE XXIV*, Vol 4710 pp. 44-51 (2002)
- 7 **H. Wang**, M. Pyda, R. Androsch and B. Wonderlich, "Application of IR Imaging During Temperature-Modulated Differential Scanning Calorimetry (TMDSC) Measurements", *SPIE THERMOSENSE XXIV*, Vol. 4710 pp. 80-86 (2002)
- 8 M.M. Baig, M.Z. Khandkar, J.A. Khan, M.A. Khan, G. Simins and **H. Wang**, "A Study of Temperature Field in A GaN Heterostructure Field-Effect Transistor", *THERMES 2002*, Santa Fe, NM, January 13-16, 2002
- 9 L. Jiang, C. R. Brooks, P. K. Liaw, **H. Wang**, C. J. Rawn and D. L. Klarstrom, "High-frequency metal fatigue: the high-cycle fatigue behavior of ULTIMETR alloy", *Materials Science and Engineering A*. 162-175, Volume 314, Issues 1-2, (2001)
- 10 B. Mikićelj, J. O. Kiggans, T. N. Tieg, P. A. Menchhofer, **H. Wang**, and H. T. Lin, "High Thermal Conductivity Lossy Dielectrics Using A Multi-Layer Approach", AcerS FGM2000, (2001)
- 11 **H. Wang** and R.B. Dinwiddie, "Characterization of Thermal Barrier Coating Using Thermal Methods", *Advanced Engineering Materials*, Vol. 3 No. 7, pp465-468 (2001)
- 12 B. B. Spencer, **H. Wang** and K.K. Anderson, "Thermal Conductivity of IONSIV IE-911 Crystalline Silicotitanate and Savannah River Waste Simulant Solutions", ORNL/TM-2000/285
- 13 **H. Wang** and R.B. Dinwiddie, "Synchronizing the IR Camera to Capture High-Speed Thermal Transients", *SPIE Thermosense XXII*, Vol. 4360, pp. 30-36 (2001)
- 14 R.R. Seeley, D.E. McCabe, S. Iskander, W.A. Simpson, **H. Wang** and F.M. Haggag, "NDE Methods to Detect the Degradation of Fracture Toughness Properties of Nickel-Based Alloys", TMS Fall Meeting, St. Louis MO, Oct. (2000)

- 15 R.W. Trice, Y. J. Su, K.T. Faber, **H. Wang** and W.D. Porter, "Effect of Heat-Treatment on Phase Stability, Lamella and Grain Morphology, and Thermal Conductivity of Plasma-Sprayed YSZ", *Journal of Materials Science*, 37(11) pp. 2359-2365 June (2002)
- 16 David T. Marx, Tod Policandriotes, Jeremy Scott, R.B. Dinwiddie and **H. Wang**, "Measurement of Interfacial Temperatures during Testing of a Subscale Aircraft Brake", *J. Applied Physics D*, 34 (6): 976-984 MAR 21 (2001)
- 17 **H. Wang**, Y. He, L. Chen, L. Jiang, P.K. Liaw and D.L. Klarstrom, "Application of Infrared Imaging during Low-Cycle Fatigue Tests of HR-120 Alloy", *Metallurgical and Materials Transaction A*, Vol. 33A, pp1287-1292 (2002)
- 18 J. Kim, P.K. Liaw, **H. Wang**, Y.T. Lee, "Damage Assessment of Ceramic Matrix Composites by Non-destructive Evaluation Techniques", *Fatigue and Fracture Behavior of High Temperature Materials*, Ed. P.K. Liaw, TMS, pp59-69 (2000)
- 19 H. Tian, P.K. Liaw, **H. Wang**, D. Fielden, L. Jiang, B. Yang, C.R. Brooks, J. P. Strizak, L. K. Mansur, J. R. DiStefano, K. Farrel, D.C. Lousteau, S.J. Pawel and G.T. Yahr, "The Effect of Frequency and Specimen Self-Heating on the Fatigue Life of 316 LN Stainless Steel", *Fatigue and Fracture Behavior of High Temperature Materials*, Ed. P.K. Liaw, TMS, pp??-?? (2000)
- 20 B. Yang, P.K. Liaw, **H. Wang**, L. Jiang, J.Y. Huang, R.C. Kuo and J.G. Huang, "Thermographic Detection of Fatigue Damage of Reactor Pressure Vessel (RPV) Steels", *Fatigue and Fracture Behavior of High Temperature Materials*, Ed. P.K. Liaw, TMS, pp??-?? (2000)
- 21 H. Maleki, J.R. Selman, R.B. Dinwiddie and **H. Wang**, "High Thermal Conductivity Negative Electrode Material for Lithium-Ion Batteries," *J. of Power Sources*, Vol. 94, pp. 26-35 (2001)
- 22 B. Yang, P.K. Liaw, **H. Wang**, L. Jiang, J.Y. Huang, R.C. Kuo and J.G. Huang, "Thermographic Investigation of Fatigue Behavior of Reactor Pressure Vessel (RPV) Steels", *Materials Science and Engineering A*. 131-139, Volume 314, Issues 1-2, (2001)
- 23 H. Tian, J. T. Broom, P. K. Liaw, **H. Wang**, D. Fielden, L. Jiang, B. Yang, C.R. Brooks, J. P. Strizak, L. K. Mansur, J. R. DiStefano, K. Farrel, D.C. Lousteau, S.J. Pawel and G.T. Yahr, "Influence of Mercury Environment on Fatigue Behavior of Spallation Neutron Sources (SNS) Target Vessel Materials", *Materials Science and Engineering A*. 140-149, Volume 314, Issues 1-2, (2001)
- 24 Y. Jennifer Su, **H. Wang**, W.D. Porter, A. R. de Arellano Lopez and K. T. Faber, "Thermal Conductivity and Phase Evolution of Plasma-Sprayed Multilayer Coatings", *Journal of Materials Science* 36(14), pp3511-3518, July (2001)
- 25 M. W. Barsoum, T. El-Raghy, W. D. Porter, **H. Wang**, C. R. Hubbard, J. Ho and H. Hamdeh, "Thermal Properties of Nb₂SnC", *J APPL PHYS* 88: (11) 6313-6316 DEC 1 (2000)
- 26 J. Kim, P.K. Liaw, **H. Wang** and You-Tae Lee, "Thermal and Mechanical Characterization of Ceramic Matrix Composites by Non-destructive (NDE) Techniques", *Advances in Ceramic Matrix Composites VI*, Edited by J. P. Singh, N. P. Bansal, and E. Ustundag, *Ceramic Transactions*, Vol. 124, pp. 241-252 (2001)
- 27 **H. Wang**, L. Jiang, R.B. Dinwiddie, P.K. Liaw, C.R. Brooks and D.R. Klarstrom, "Application of High-Speed IR Imaging During Mechanical Fatigue Tests", *SPIE Thermosense XXII*, Vol. 4020 pp 186-193 (2000)

- 28 R.L. Hecht, R.B. Dinwiddie and **H. Wang**, "The effect of graphite flake morphology on the thermal diffusivity of gray cast irons used for automotive brake discs", *Journal of Materials Science*, 34: (19) 4775-4781 (1999)
- 29 R. Androsch, M. Pyda and **H. Wang**, and B. Wunderlich "Temperature Modulated Differential Scanning Calorimetry Using High-Resolution Infrared Thermography", *J. Thermal Analysis and Calarimetry* Vol. 61, pp. 661-679 (2000)
- 30 M.W. Barsoum, C.J. Rawn, T. El-Raghy, A. Procopio, W.D. Porter, **H. Wang** and C.R. Hubbard, "Thermal Properties of Ti_4AlN_3 ", *J. Appl. Phys.* Vol. 87, No.12, pp.1-8 (2000)
- 31 S. Raghavan, **H. Wang**, W.D. Porter, R.B. Dinwiddie and M. Mayo, "Thermal Properties of Zirconia Co-doped with Trivalent and Pentavalent Oxides", *Acta Mater*, 49, pp. 169-179 (2001)
- 32 L. Jiang, **H. Wang**, P.K. Liaw, C.R. Brooks and D.L. Klarstrom, "Characterization of Temperature Evolution during High-Cycle Fatigue of ULTIMET[®] Superalloy: Experimental and Modeling", *Metallurgical and Materials Transaction A*, Vol. 32A, No.1, pp. 2279-2296 (2001)
- 33 T. Molibog, R.B. Dinwiddie, W. D. Porter, **H. Wang** and H. Littleton, "Thermal Properties of Lost Foam Casting Coatings", *American Foundrymen's Society Transaction*, No. 00-167 (2000)
- 34 P.K. Liaw, **H. Wang**, L. Jiang, B. Yang, J.Y. Huang, R.C. Kuo and J.G. Huang, "Thermographic Detection of Fatigue Damage of Pressure Vessel Steels at 1,000 Hz and 20 Hz," *SCRIPTA MATER* 42: (4) 389-395 JAN 31 (2000)
- 35 **H. Wang**, L. Jiang, P. K. Liaw, C. R. Brooks and D.L. Klarstrom, "Infrared Temperature Mapping of ULTIMET[®] Superalloy during High-Cycle Fatigue Tests", *Metallurgical and Materials Transaction A* Vol. 31A, 1307-1310(2000)
- 36 S. Graham, D.L. McDowell, E. Lara-Curzio, R. B. Dinwiddie and **H. Wang** The Effects of Microstructural Damage on the Thermal Diffusivity of Continious Fiber-Reinforced Ceramic Matrix Composites," *Mechanical, Thermal and Environmental Testing and Performance of Ceramic Composites and Components*, ASME STP 1392, Ed. Jenkins, Lara-Curzio and Gonczy, pp. 185-200 (2000)
- 37 A. Wereszczak, **H. Wang**, M. Karakus, W. Curtis, V. Amue and D. VerDow, "Postmortem Analyses of Salvaged Conventional Silica Bricks from Glass Production Furnaces", *GLASS SCI TECHNOL* 73: (6) 165-174 JUN (2000)
- 38 R.W. Trice, Y. J. Su, K.T. Faber, **H. Wang** and W.D. Porter, "The Role of NZP Additions in Small-Particle Plasma-Sprayed YSZ: Microstructure, Thermal Conductivity and Phase Stability Effects", *Materials Science and Engineering* , A272 284-291 (1999)
- 39 **H. Wang** and R. B. Dinwiddie, "Applications of IR Thermography in Capturing Thermal Transients and Other High Speed Thermal Events", *SEM Annual Conference Proceeding* , 375- 378 (1999)
- 40 **H. Wang** and A. Wereszczak, "Thermal Conductivity of Refractory Materials Used in the Glass Production Industry", *Thermal Conductivity* 25, Ed. Uher and Morelli, Technomic Publishing Co. Inc., 350-357(1999)
- 41 **H. Wang** and E.A. Payzant, "Infrared Imaging of Temperature Distribution in a High-temperature X-ray Diffraction Furnace", *SPIE Conference Proceeding*, Vol. 3700, pp. 377-385 (1999)
- 42 M.W. Barsoum, T. El-Raghy, C.J. Rawn, W.D. Porter, **H. Wang**, E.A. Payzant and C.R. Hubbard,"Thermal Properties of Ti_3SiC_2 ", *J. Phys. and Chem. of Solids* , vol.60, No.4, Pages 429-439 (1999)
- 43 **H. Wang** and Ralph B. Dinwiddie, "Reliability of Laser Flash Thermal Diffusivity Measurements of Thermal Barrier Coatings", *J. Thermal Spray Technology*, Vol. 9(2), 210-214(2000)

- 44 H. Maleki, S.A. Hallaj, J.S. Hong, J.R. Selman, R.B. Dinwiddie and **H. Wang**, "Thermal Properties of Lithium Ion Battery and Components", *J. of Electrochemical Soc.* Vol. 146, No.3, pp 947-954(1999)
- 45 R.L. McMasters, J.V. Beck, R.B. Dinwiddie and **H. Wang**, "Accounting for Penetration of Laser Heating in Flash Diffusivity Experiments", *ASME J. of Heat Transfer*, Vol. 121, No.1, 15-21 (1999)
- 46 F.A. Modine et al and **H. Wang**, "Influence of Ceramic Microstructure on Varistor Electrical Properties", *Ceramic Transactions-Dielectric Ceramic Materials*, Vol.100, pp. 469-491 (1999)
- 47 **H. Wang** and R. B. Dinwiddie, "Microscopic Thermal Diffusivity Mapping Using an IR Camera", *Thermal Conductivity 24*, Ed. P. S. Gaal, Technomic Pub. Co., pp. 303-312 (1998)
- 48 S. Raghavan, **H. Wang**, R.B. Dinwiddie, W.D. Porter and M. Mayo, "The Effect of Grain Size, Porosity and Ytria Content on the Thermal Conductivity of Nanocrystalline Zirconia", *Scripta Materialia*, Vol. 39, No.8, pp. 1119-1125 (1998)
- 49 **H. Wang**, M. Bartkowiak, F.A. Modine, R.B. Dinwiddie, L.A. Boatner and G.D. Mahan, "Non-uniform Heating in ZnO Varistors Studied by Infrared Imaging and Computer Simulation", *J. Am. Ceram. Soc.* 81 (8) 2013-22 (1998)
- 50 **H. Wang** and R.B. Dinwiddie, "Thermal Diffusivity Mapping of Carbon-carbon Composites", *Ceramic Engineering & Science Proceedings*, 21st Annual Cocoa Beach Conference and Exposition on Advanced Ceramics, Materials and Structures, Vol. 18 No.4 B, pp755-762 (1997)
- 51 A. Mogro-Campero, C.A. Johnson and P.J. Bendarczyk, GE R&D Center; R.B. Dinwiddie and **H. Wang**, "Effect of Gas Pressure on Thermal Conductivity of Zirconia Thermal Barrier Coating", *Surface and Coatings Technology*, 94-95, 102-105 (1997)
- 52 **H. Wang**, R. B. Dinwiddie and P.A. Gaal, "Multiple Station Thermal Diffusivity Instrument", *Thermal Conductivity 23*, Eds. K.E. Wilkes, R. B. Dinwiddie and R. S. Graves, Technomic Publishing Co. pp119-127 (1996)
- 53 **H. Wang** and R. B. Dinwiddie, "Advanced Thermal Imaging of Composite Materials", *Advances in Ceramic-Matrix Composites III*, Ceramic Transactions, Vol. 74, pp609-618(1996)
- 54 J. D. Makinson, W.N. Weins, R. Schalek, A.C. Axtell, **H. Wang** and R.B. Dinwiddie, "Thermal Diffusivity of Nanocrystalline Copper-Iron Prepared by Mechanically Alloying", *Nanostructured Materials*, Vol 9, No. 1-8, pp 519-522 (1997)
- 55 R. L. Hecht R.B. Dinwiddie, W.D. Porter and **H. Wang**, "Thermal Transport Properties of Gray Cast Irons", SEA Brake Colloquium, New Orleans, LA 962126 (1996)
- 56 **H. Wang**, W. A. Schulze and J. F. Cordaro "Averaging Effect on I-V Characteristics of ZnO Varistors" *Jpn. J. Appl. Phys.* Vol. 34, Part 1, No. 5, 2352 (1995)
- 57 **H. Wang**, W. Li and J. F. Cordaro "Single Junctions in ZnO Varistors Studied by I-V Characteristics and DLTS" *Jpn. J. Appl. Phys.* Vol. 34, Part 1, No. 4A, 1765 (1995)
- 58 **H. Wang**, "Grain Boundary Electronic Properties of ZnO Varistors-from bulk to single junctions" Ph.D. Thesis, UMI Dissertation Information Service (1994)
- 59 **H. Wang**, P. F. Johnson and W. C. LaCourse "Sonic Strengthening Effect on SLS Glass" Proc. Dalian International Conference on Glass, *China Science and Technology Press*, pp.226-230 (1991)
- 60 Y. S. He, J. Xiang, **H.(X) WANG**, A.S. He, J.C. Zhang, F.G. Chang, "The Structural Phase-Transition Near 210 K of Bi-Based Superconductors" *Chinese Science Bulletin* 35: (17) 1419-1423 (1990)

- 61 Y. S. He, **H.(X) Wang** et al. "Possible Structural Phase Transition Near 210K of Single Phase Bi(Pb)-Sr-Ca-Cu-O Superconducting Ceramics" *Phys.Rev. B* **40**(10) 7384 (1989)
- 62 **H. Wang**, "Sonic Strengthening Effect of Soda-Lime-Silicate Glass" MS thesis, Published by Alfred University, May (1991)
- 63 **H. Wang**, "Ultrasonic Attenuation and Sound Speed Measurements of Superconducting Ceramics" BS thesis, Published by Tsing Hua University, July (1989)

Papers (submitted)

Kadolkar, P, **H. Wang**, T. R. Watkins, and N. B. Dahotre, " Thermographic Characterization of Laser Surface Engineered Ceramic Coating on Metal," *Int'l Journal of Advanced Mfg Tech*, 2002

Presentations and talks:

- 1 **H. Wang**, V. R. W. Amarakoon and J. F. Cordaro "Interface States Study of Halogen Treated ZnO Varistor" *Ceramic Bulletin*, **71**(3) 463 (1992)
- 2 **H.Wang**, GE Aircraft Engines, "Thermal Conductivity Measurements", invited Seminar, Cincinnati, OH, Oct.6 1996
- 3 L. Tan, R.A. Bambauer, T.A. DeLong, R.B. Dinwiddie and **H. Wang**, "The Effect of Thermal Conductivity on Metal Fill in Lost Foam Casting of Aluminum", American Foundry Society, 1997
- 4 **H.Wang** and R. B. Dinwiddie, ORNL; B.A. Nagaraj GE Aircraft Engines, "The Effects of Thermal Aging on Thermal Conductivities of Thermal Barrier Coatings", 2nd Annual Surface Engineering Symposium, Materials Week '96, Cincinnati, OH Oct.7 1996.
- 5 **H. Wang**, R.B. Dinwiddie, F.A. Modine, L.A. Boatner, M. Bartkowiak and G.D. Mahan, "Thermal-Boundary Resistance at Solid-Solid Interfaces Studied by High-Resolution Infrared Imaging", presented at the Thirteenth Symposium on Thermophysical Properties, Boulder, CO 1997
- 6 **H. Wang**, PPG Industries, Inc., "Thermal Imaging and Thermophysical Property Measurements", invited Seminar, Pittsburgh, PA, Oct. 30, 1997.
- 7 J. A. A. Williams, **H. Wang** et al. "RF Aerosol Mist Plasma Deposition of Oxide films" Proc. MRS Fall Meeting, November (1994)
- 8 A. McGinnis, K. Jagannadham, **H. Wang** and R.B. Dinwiddie, "Heat Spreader Characteristics of Multilayer Diamond Films for High Frequency Power Devices", MRS Fall Meeting, Boston, 1997
- 9 **H. Wang**, NCMS Workshops, "Thermography Facility at ORNL", Invited talk, September 22, Dearborn MI, 1998
- 10 **H. Wang**, "Applications of Infrared Imaging in Materials Science", Invited seminar at the University of Tennessee Materials Science and Engineering Department, November, 1998
- 11 **H. Wang**, P.J. Blau and R. B. Dinwiddie, "Application of Micro-Tribothermography to Study Wear Damage Progression on Coated Surface." ASM Materials Solution, Cincinnati, OH November 1999
- 12 **H. Wang**, L. Jiang, P.K. Liaw, C. Brooks, D.R. Klarstrom and R. Seeley, "IR Thermography: A New Technique to Study Cyclic Fatigue." TMS Fall Meeting, Cincinnati, OH November, 1999
- 13 **H. Wang**, "Characterization of Thermal Barrier Coatings: Thermal Conductivity Measurements and Infrared Imaging", Invited talk at the 102th Annual Meeting of the American Ceramic Society, April 30-May 4, 2000, St. Louis MO.

Posters:

- 1) R.B. Dinwiddie and **H. Wang**, "Temperature Measurements, Thermophysical Properties, and NDE Characterization Using a High-speed, High-sensitivity IR Camera", Automotive Technology Development Customers' Coordination Meeting, Dearborn MI, Oct. 27-30, (1997)
- 2) R. L. Hecht, R.B. Dinwiddie, W.D. Porter and **H. Wang**, "Thermal Transport Properties of Aluminum Metal Matrix Composites for Brake Applications", Automotive Technology Development Customers' Coordination Meeting, Dearborn MI, Oct. 27-30, (1997)
- 3) R. B. Dinwiddie and **H. Wang**, "Thermal Transport Properties and Infrared Imaging of Thermal Barrier Coatings", Thermal Barrier Coating Workshop, Ft. Mitchell, KY, May 19-21 (1997)
- 4) C. R. Hubbard et. al. And **H. Wang** "Brake Syatem Improvement", Automotive Technology Development Customers' Coordination Meeting, Dearborn MI, Oct. (1996)
- 5) E.A. Payzant and **H. Wang**, "Precision and Accuracy of Temperature Measurement for High Temperature X-ray Diffractometry ", Denver X-ray Conference (1998)

Reports:

Hemrick, JG, A. A. Wereszczak, M. Karakus, K. C. Liu, H. Wang, B. A. Pint, T. P Kirkland, R. E. Moore, "Compressive Creep and Thermophysical Performance of Mullite Refractories," **ORNL/TM-2002/84**, 2002.