

Martha L. Mecartney - Publications

Books Edited (BE)

- BE1. A.K. Cheetham, C.J. Brinker, M.L.Mecartney, C. Sanchez, eds., Better Ceramics Through Chemistry VI, Materials Research Society, Pittsburgh, Pennsylvania, (1994).

Book Chapters (BC)

- BC1. J. R. Bellare, J. K. Bailey and M. L. Mecartney, "Direct Observation of the Structure of Sols and Gels," Chapter 65, pp. 835-842 in Processing of Advanced Ceramics, J. D. Mackenzie and D. R. Ulrich, editors, John Wiley and Sons (1988).
- BC2. J.K. Bailey and M.L.Mecartney, "Characterization of Structural Development in Sol-Gel Systems by Cryogenic Transmission Electron Microscopy," Chapter 5, pp. 57-68 in Ultrastructure Processing of Advanced Materials, eds. D.R. Uhlmann and D.R. Ulrich Wiley and Sons (1992) .

Journal Articles, Peer Reviewed (J)

- J1. M. L. Mecartney, W. T. Donlon and A. H. Heuer, "Plastic Deformation in CaO-stabilized ZrO₂ (CSZ)," *J. Mat. Sci.*, **15** 1063-65 (1980) .
- J2. M. L. Mecartney, R. Sinclair, and R. E. Loehman, "Silicon Nitride Joining," *J. Am. Ceram. Soc.* **68**, [9] 472-478 (1985).
- J3. M. L. Mecartney, "The Influence of an Amorphous Second Phase on the Properties of Yttria Tetragonal Zirconia Polycrystals (Y-TZP)," *J. Am. Ceram. Soc.* **70** [1] 54-58 (1987).
- J4. M. L. Mecartney , "The Influence of Dissolved Si₃N₄ on the Properties of Al₂O₃-MgO-SiO₂ Glass," *J. Mat. Sci. Lett.* **6** [3] 370-372 (1987).
- J5. M. L. Mecartney, "Enhanced Crystallization of a Glassy Phase in Silicon Nitride by the Addition of Scandia," *J. Am. Ceram. Soc.* **70** [12] C-380-C-382 (1987).
- J6. M. Tuominen, A.M. Goldman, and M.L. Mecartney, "Time Dependent Magnetization of a Superconducting Glass," *Phys. Rev. B*, **37** [1] 548-551 (1988).
- J7. M. Tuominen, A.M. Goldman, and M.L. Mecartney, "Superconducting Glass Behavior of YBa₂Cu₃O_x," *Physica C* **153** [1] 324-325 (1988).
- J8. H. Kim, D. D. Berkeley, A. M. Goldman, R. K. Schulze, and M. L. Mecartney, "Electronic Structure Changes and Superconductivity in YBa₂Cu₃O₇," *Phys. Rev. B*, **37** 9745-9748 (1988).

- J9. D. D. Berkeley, K. H. Kim, B. R. Johnson, A. M. Goldman, and M. L. Mecartney, K. Beauchamp, and J. Maps, "Preparation of $Y_2Ba_4Cu_8O_{20-x}$ Thin Films by Thermal Coevaporation," *Appl. Phys. Lett.* **53** [8] 708-709 (1988).
- J10. D. D. Berkeley, B. R. Johnson, N. Anand, J. Maps, J. Morton, M. Tuominen, K. Maursburger, A. M. Goldman, K. M. Beauchamp, Y. -J. Zhang, M. L. Mecartney, L. E. Conroy, "In-situ Formation of Superconducting $YBa_2Cu_3O_{7-x}$ Thin Films Using Pure Ozone Vapor Oxidation," *Appl. Physics Lett.* **53** [20] 1973-1976 (1988).
- J11. D.D. Berkeley, B.R. Johnson, N. Anand, K.M. Beauchamp, L.E. Conroy, A.M. Goldman, J. Maps, K. Mauersberger, M.L. Mecartney, J. Morton, M. Tuominen, and Y.J. Zhang, "Ozone Processing of MBE Grown $YBa_2Cu_3O_{7-x}$ Films," *IEEE Transactions on Magnetism*, **25** [2] 2522-2525 (1989).
- J12. J. K. Bailey, T. Nagase, S. Broberg, M. L. Mecartney, "Structural Evolution and Rheological Properties During the Gelation of Ceramic Sols," *J. of Noncrystalline Solids* **109**, 198-210 (1989).
- J13. M. L. Mecartney, and M. Ruhle, "In-situ Transmission Electron Microscopy Observations of the Monoclinic to Tetragonal Phase Transformation in Tetragonal ZrO_2 ," *Acta Metall.* **37** [7] 1859-1989 (1989).
- J14. C.C. Hsueh, M. R. Hanson, W. Harrison, B. E. Koepke and M. L. Mecartney, "Microstructure and Electrical Properties of Fast-fired Lead Zirconate-Titanate Ceramics," *J. Mater. Sci. Lett.*, **8**, 1209-1216 (1989).
- J15. B.R. Johnson, K.M. Beauchamp, T. Wang, J.X. Liu, A. McGreer, J.C. Wan, M. Tuominen, Y.J. Zhang, M.L. Mecartney, and A. M. Goldman, "In-situ Growth of $DyBa_2Cu_3O_{7-x}$ Thin Films by Molecular Beam Epitaxy," *Appl. Phys. Lett.* **56** [19] 1911-1913 (1990).
- J16. M. Shane and M. L. Mecartney, "Sol-Gel Synthesis of Zirconia Barrier Coatings," *J. Mater. Sci.*, **25** [1] 1537-1544 (1990).
- J17. Y. J. Lin, P. Angelini and M. L. Mecartney, "The Influence of Silicate Grain Boundary Phases on Microstructure and Chemistry in Yttria Stabilized Zirconia," *J. Am. Ceram. Soc.*, **73** [9] 2728-35 (1990).
- J18. J.K. Bailey, C.W. Macosko, and M.L. Mecartney, "Modeling the Gelation of Silicon Alkoxides," *J. Noncryst. Solids* **125** [1] 208-223 (1990).
- J19. K.M. Beauchamp, Y.J. Zhang, B.R. Johnson, R.K. Schultz, G.C. Spalding, M. Tsen, T. Wang, J.F. Evans, M.L. Mecartney, and A.M. Goldman, "Barrier Technology for $DyBa_2Cu_3O_{7-x}$ Junctions and Related Structures," *IEEE Transactions on Magnetism*, **27** [2] 3090-3093 (1991).

- J20. C.C. Hsueh and M.L. Mecartney, "Microstructural Development and Electrical Properties of Sol-Gel Prepared Lead Zirconate-Titanate Thin Films," *J. Mater. Res.* **6** [10] 2208-2217 (1991).
- J21. Y. J. Zhang, K.M. Beauchamp, B.R. Johnson, T. Wang, A.M. Goldman and M. L. Mecartney, "Heteroepitaxial Growth of DyBa₂Cu₃O_{7-x}/Dy₂O₃ Multilayers Analyzed by TEM," *J. Mater. Res.* **7** [1] 29-33 (1992).
- J22. J.K. Bailey and M.L. Mecartney, "Formation of Colloidal Silica Particles from Alkoxides," *Colloids and Surfaces* **63** [1-2] 151-161 (1992).
- J23. V. Agrawal, N. Chandrasekhar, Y.J. Zhang, V.S. Achutharaman, M.L. Mecartney, and A. M. Goldman, "Nucleation and Growth of DyBa₂Cu₃O_{7-x} Thin Films on SrTiO₃ Substrates Studied by Transmission Electron Microscopy and Atomic Force Microscopy," *J. Vac. Sci. Technol. A*, **10** [4] 1531-1536 (1992).
- J24. G. Goo, J.C. Graves, and M.L.Mecartney, "Interfacial Reaction of Coated SiC Fiber with Gamma TiAl" *Scripta Met. et Mat.*, **26** [7] 1043-1048 (1992).
- J25. J.K. Bailey, G.A. Pozarnsky, and M.L. Mecartney, "The Direct Observation of Structural Development During Vanadium Pentoxide Gelation," *J. Mater. Res.*, **7** [9] 2530-2537 (1992).
- J26. J. K Bailey, C. J Brinker, and M. L. Mecartney, "Growth Mechanisms of Iron Oxide Particles of Differing Morphologies from the Forced Hydrolysis of Ferric Chloride Solutions," *J. Colloid and Interface Science*, **157**, pp. 1-13 (1993)
- J27. M.C. Gust, G. Goo, J. A. Wolfenstine, and M.L. Mecartney, "The Influence of Amorphous Grain Boundary Phases on the Superplastic Behavior of 3Y-TZP," *J. Am. Ceram. Soc.* **76** [7] 1681-90 (1993).
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- J29. V. Joshi, D. Roy, and M.L. Mecartney, "Low Temperature Synthesis and Properties of Lithium Niobate Thin Films," *Applied Physics Letters*, **63** [10] 1331-1333 (1993).
- J30. D. Roy, V. Joshi, and M.L. Mecartney, "Process/Property Correlations in Sol-Gel Derived Lithium Niobate Thin Films on Silicon," *J. of Integrated Ferroelectrics* **4** [3] 207-215 (1994).
- J31. G. Derderian, J.Barrie, K Atchison, P. Adams, M.L. Mecartney, "Microstructure/Process Relations in Sol-Gel Prepared KNbO₃ Thin Films on (100) MgO," *J. Am. Ceram. Soc.* **77**[3] 820-828 (1994).

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- J33. M.C. Gust, N.D. Evans, L.A. Momoda, and M.L. Mecartney, "In-Situ Transmission Electron Microscopy Crystallization Studies of Sol-Gel Derived Barium Titanate Thin Films," *J. Am. Ceram. Soc.* **80** [11] 2828-36 (1997).
- J34. H. C. Allen, M.L. Mecartney, and J.C. Hemminger, "Minimizing Transmission Electron Microscopy Beam Damage during the Study of Surface Reaction on Sodium Chloride," *Microscopy and Microanalysis* **4**, 23-33, (1998).
- J35. A.A. Sharif, P.H. Imamura, T.E. Mitchell, and M.L. Mecartney, "Grain Growth of Cubic Yttria Stabilized Zirconia in the Presence of Intergranular Silicate Phases," *Acta Mat.* **46** 3863-3872 (1998).
- J36. P.H. Imamura, T. Sakuma, N.D. Evans, and M.L. Mecartney, "High Temperature Tensile Deformation of Glass Doped 3Y-TZP," *Journal of the American Ceramic Society*, **83** [12] 3095-3099 (2000).
- J37. A.Y. Oral and M.L. Mecartney, "Phase and Microstructural Development of Sol-gel Derived SBN Thin Films", *Journal of Materials Research*, **15** [6] 1417-1423 (2000).
- J38. A.A. Shapiro, N. Kubota, K. Yu, M.L. Mecartney, "Stress testing of a recrystallizing CaO-B₂O₃-SiO₂ glass-ceramic with Ag electrodes for high frequency electronic packaging," *J. Electronic Materials*, **30** [4] 386-390 (2001).
- J39. M.C. Gust, L.A. Momoda, N.D. Evans, and M.L. Mecartney, "Crystallization of Sol-Gel Derived Barium Strontium Titanate Thin Films," *J. Am. Ceram. Soc.*, **84** [5] 1087-1092 (2001).
- J40. A.Y. Oral and M.L. Mecartney, "Properties of Sol-Gel Derived Strontium Barium Niobate Ceramics and the Effect of V₂O₅ Additive," *J. Materials Science*, **36** [22] 5519-5527 (November 2001).
- J41. A.A. Shapiro, M.L. Mecartney, H.P. Lee. "A Comparison of Microstrip Models to Low Temperature Co-fired Ceramic-Silver Microstrip Measurements," *Microelectronics Journal*, **33** [5-6] 443-7 (2002).
- J42. A.A. Sharif and M.L. Mecartney. "Superplasticity in Cubic Yttria-Sabilized Zirconia with Intergranular Silica," *Acta Materialia*, **51** [6] 1633-9 (2003).
- J43. M.C. Martin and M.L. Mecartney. "Grain Boundary Ionic Conductivity of Yttria Stabilized Zirconia as a Function of Silica Content and Grain Size," *Solid State Ionics*, **161** [1-2] 67-79 (2003).

- J44. A.A. Sharif and M.L. Mecartney "Superplasticity in cubic yttria stabilized zirconia with 10 wt.% alumina," *Journal of the European Ceramic Society* **24** [7] 2041-2047 (2004).
- J45. R.P. Dillon, SS Sosa, and M.L. Mecartney. "Achieving tensile superplasticity in 8 mol% Y₂O₃ cubic stabilized ZrO₂ through the addition of intergranular silica." *Scripta Materialia*, **50** [12] 1441-4 (2004).
- J46. T. Chen and M.L. Mecartney, "A High-Strain-Rate Alumina-based Ceramic Composite," *Journal of the American Ceramic Society* **88** [4] 1004-1006 (2005)
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- J51. S.Tekeli, T. Chen, H.Nagayama, T. Sakuma and M. L.Mecartney, "High-temperature deformation behaviour of TiO₂-doped 8 mol.% Y₂O₃-stabilized ZrO₂ (8Y-CSZ) under tension and compression" *Ceramics International* **33** [5] 869-874 (2007).
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- J.53 T. Chen, S.Tekeli, R.P. Dillon, and M. L.Mecartney, "Phase stability, microstructural evolution and room temperature mechanical properties of TiO₂ doped 8 mol% Y₂O₃ stabilized ZrO₂ (8Y-CSZ) " in press *Ceramics International (on line* 2006).
- J.54. Lili Taherabadi, Joy E. Trujillo, Tiandan Chen, John R. Porter, and Martha L. Mecartney, "Observation of Dislocation Assisted High Temperature Deformation in Mullite and Mullite Composites," in press, *Journal of the European Ceramic Society* (2007).
- J55. P. West, N. Starostina, M. Brodsky, S. Prikhodko, C.M. Hoo, and M.L. Mecartney "AFM capabilities in characterization of particles and surfaces: from angstroms to microns," accepted for publication, *Journal of Cosmetic Science*.

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- J58. M.C. Martin, N.D. Evans, J. Bentley and ML Mecartney, "Comparison of Electrical and Chemical Grain Boundary Widths in 8 mol% Y₂O₃ Stabilized ZrO₂ (YSZ)," under final review with coauthors at ORNL.
- J59. L. Ramirez, M. L. Mecartney, S. P. Krumdeick, "Nano-crystalline ZrO₂ Thin Films on Silicon Fabricated by Pulsed-Pressure Metal Organic Chemical Vapor Deposition (PP-MOCVD)," in preparation.
- J60. C.M. Hoo, T. Doan, N. Starostina, P. West, and M.L. Mecartney, "Deposition Techniques for AFM Analysis of Nanoparticles," in preparation.
- J61. S.R. Bang, J. Roth, and M. L. Mecartney, "Ionic Conductivity of Lithia Doped Ytria Stabilized Zirconia," in preparation.
- J62. K. S. Olson, C. Wong, N. Starostina, P. West, and M.L. Mecartney, "Accurate Measurements of Nanoparticle Diameter using AFM," in preparation.
- J63. L. Teharabadi, J.R. Porter, and M.L. Mecartney, "Characterization of Dislocations in Mullite," in preparation.
- J64. M. Gust, L. Teharabadi, J.R. Porter, and M.L. Mecartney, "Grain Boundary Sliding in Multiphase Superplastic Ceramics," in preparation.

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- R1. M. L. Mecartney, R. Sinclair, and G. J. Ewell, "Chemical and Microstructural Analyses of Grain Boundaries in BaTiO₃-based Dielectrics," *Advances in Ceramics*, vol. 1. *Grain Boundary Phenomenon in Electronics Ceramics*, 207-214 (1981).
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- R3. J. K. Bailey, J. R. Bellare, and M. L. Mecartney, "Preparation of Vitriified TEM Samples for the Direct Observation of Sol and Gel Structures," pp. 69-74 in *Specimen Preparation for Transmission Electron Microscopy of Materials*, eds. J. C. Bravman, R. M. Anderson, M. L. McDonald, MRS Symposia Proceedings, vol. 115 (1988).

- R4. M. A. Accibal, J. W. Draxton, A. L. Gabor, W. L. Gladfelter, E. Hassler, and M. L. Mecartney, "Comparison of Several Cu(I) and CU(II) Precursors for the Sol-Gel Preparation of High T_c Superconducting Metal Oxides," *Better Ceramics Through Chemistry III*, Mat. Res. Soc. Symp. Proc., pp. 401-406, (1988).
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- R9. J.K. Bailey and M.L. Mecartney, "Mechanisms of Silica and Titania Colloidal Particle Formation From Metal Alkoxides," in *Better Ceramics Through Chemistry IV*, Mat. Res. Soc. Symp. Proc. vol. 180, pp. 153-158 (1990).
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- R17. M.C. Gust, L.A. Momoda, and M.L. Mecartney, "Influence of Precursor Chemistry on the Microstructure and Crystallization of Barium Titanate Thin Films," pp. 85-91 in *Sol-Gel Science and Technology*, ed. E. Pope, American Ceramics Society (1995).
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Other Publications (O)

- O1. M. L. Mecartney, R. Sinclair, "Analytical Electron Microscopy of Ferroelectric BaTiO₃," *38th Annual Proc. Microscopy Society of America*,, 364-65 (1980).

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- O10. M.L.Mecartney, "TEM Studies of Sol-gel Derived Ferroelectric Oxide Thin Films" pp. 580-581 in *52nd Annual Proc. Microscopy Society of America*, (1994).
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- O13. M.C. Gust, N.D. Evans, and M.L. Mecartney, "Crystallization of Barium Titanate Thin Films Synthesized Via Sol-gel Processing," *53rd Annual Proc. Microscopy Society of America*, Ed. G.W. Bailey, San Francisco Press (1995).

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