

Professor Kathy Lu's Group Publications

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Patents:

1. K. Lu, M. K. Mahapatra, "Barium Oxide, Calcium Oxide, Magnesia, and Alkali Oxide Free Glass," US8,541,327, September 2013.
2. K. Lu, F. Shen, Tri-Layer CO(3)O(4)-SDC Protective Coating for Solid Oxide Fuel Cell Interconnects, U.S. Patent Application No: 62/318,369, April 2016.

Publications:

Books:

1. K. Lu, Nanoparticulate Materials-Synthesis, Characterization, and Processing, John Wiley & Sons, Inc., Hoboken, New Jersey, ISBN: 978-1-1182-9142-9, 464 pages, October 2012.
2. K. Lu, Materials in Energy Conversion, Harvesting, and Storage, John Wiley & Sons, Inc., Hoboken, New Jersey, ISBN: 978-1-118-88910-7, 448 pages, September 2014.

Books Edited:

1. N. P. Bansal, J. P. Singh, A. Bhalla, M. M. Mahmoud, N. Jose Manjooran, G. Singh, K. Lu, G. Brenneka, Processing and Properties of Advanced Ceramics and Composites VI, Ceramic Transactions, Volume 249, ISBN: 978-1-118-99549-5, 375 pages, September 2014, Wiley.
2. K. Lu, N. J. Manjooran, R. Murakam, and G. Pickrell, Advances in Synthesis, Processing and Applications of Nanostructures, Ceramic Transactions, Volume 238; ISBN: 978-1-1182-7327-2, August 2012, Wiley.
3. K. Lu, N. Manjooran, M. Radovic, G. Pickrell, E. Medvedovski, E. A. Olevsky, C. Li, G. Singh, and N. Chopra, Advances in Nanomaterials and Nanostructures, Ceramic Transactions, Volume 229, ISBN: 978-1-118-06002-5, August 2011, Wiley.
4. K. Lu, C. Li, Processing of Nanoparticle Materials and Nanostructured Films, Ceramic Transactions, Volume 223, 2010, ISBN 978-0-470- 92731-1, Wiley.
5. T. Hinklin, K. Lu, Processing of Nanoparticle Structures and Composites: Ceramic Transactions, Volume 208, ISBN: 978-0-470-40846-9, August 2009, Wiley.

Book Chapters:

1. K. Lu, K. Ning, "Nanoscale Sintering," Metal Oxide Nanoparticles: Formation, Functional Properties and Interfaces, *Metal Oxide Nanoparticles: Formation, Functional Properties and Interfaces*, First Edition. Edited by Oliver Diwald and Thomas Berger. © 2021 John Wiley & Sons Ltd.

2. K. Lu, W. Li, and B. Chen, "Sintering of Porous Materials," Sintering: Mechanisms of Conventional Nanodensification and Field Assisted Processes, Editors: Ricardo H. R. Castro, Klaus van Benthem, Springer, Engineering Materials 35, 2013, Volume 35, 115-136, DOI: 10.1007/978-3-642-31009-6_6.
3. K. Lu, "Shaping of 3D Nanoceramics and Their Composites," *Handbook of Nanoceramics and Their Based Devices*, American Scientific Publishers, Edited by T.Y. Tseng and H. S. Nalwa, vol. 2, p 151-177, ISBN:1-58883-116-7, Stevenson Ranch, CA, 2009.
4. K. Lu and X. Zhu, "Liquid Nanoparticles: Synthesis and Characterization," *Encyclopedia of Nanoscience and Nanotechnology*, American Scientific Publishers, Stevenson Ranch, CA, 2010. Editor: H. S. Nalwa, ISBN: 1-58883-146-7, Volume 15, 537-574, 2010.

Journal papers:

1. N. Yang, K. Lu, "Phase Content Prediction in Polymer-derived Ceramics with Metal Additives," *Journal of the American Ceramic Society*, accepted.
2. Y. J. Cho, K. Lu, "Water Vapor Oxidation of SiC Layer in Surrogate TRISO Fuel Particles," *Composites Part B: Engineering*, 215 (15) 108807, 2021.
3. J. Zheng, K. Lu, "Electrically Conductive and Thermally Stable SiC-TiC Containing Nanocomposites via Flash Pyrolysis," *Journal of the American Ceramic Society*, 104(6) 2460-2471, 2021.
4. N. Yang, K. Lu, "Effects of Transition Metals on the Evolution of Polymer-Derived SiOC ceramics," *Carbon*, 171, 88-95, 2021.
5. L. Kong, A. Rau, N. Yang, K. Lu, "ZnO Nanoparticle-Poly(methyl methacrylate) Hybrids as Flexible Ultraviolet Shielding Films," *JOM*, 73(1), 432-440, 2021.
6. K. Bawane, K. Lu, X. Bai, J. Hu, M. Li, P. M. Baldo, E. Ryan "Microstructural Evolution of a Silicon Carbide-Carbon Coated Nanostructured Ferritic Alloy Composite during In-Situ Kr Ion Irradiation at 300°C and 450°C," *Journal of Materials Science and Technology*, 71 (30), 75-83, 2021.
7. Y. J. Cho, K. Lu, "High Temperature Oxidation Behaviors of Bulk SiC with Low Partial Pressures of Air and Water Vapor in Argon," *Corrosion Science*, 174, 108795 (8 pages), 2020.
8. N. Yang, W. Wang, W. Cai, K. Lu, "Corrosion and Tribocorrosion Mitigation of Perhydropolysilazane-Derived Coatings on Low Carbon Steel," *Corrosion Science*, 177, 108946 (11 pages), 2020.
9. N. Yang, K. Lu, "Ultrahigh Surface Area SiOC Ceramics Based on Perhydropolysilazane and Polysiloxane," *Microporous and Mesoporous Materials*, 306(15), 110477 (9 pages), 2020.
10. Y. J. Cho, K. Lu, "Water Vapor Oxidation Behaviors of Nuclear Graphite IG-110 for a Postulated Accident Scenario in High Temperature Gas-Cooled Reactors," *Carbon*, 164(30) 251-260, 2020.
11. Y. J. Cho, L. Kong, R. Islam, and K. Lu, "Photothermal Self-Healing of Gold Nanoparticle-Polystyrene Hybrids," *Nanoscale*, 12, 20726 (11 pages), 2020.
12. Y. Bai, J. Zhao, Z. Lv, K. Lu, "Enhanced Piezocatalytic Performance of ZnO Nanosheet Microspheres by Enriching the Surface Oxygen Vacancies," *Journal of Materials Science, J Mater Sci*, 55:14112-14124, 2020.
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14. K. Bawane, K. Lu, Q. Li, R. Bordia, "High Temperature Oxidation Behaviors of SiON Coated AISI 441 in Ar+O₂, Ar+H₂O, and Ar+CO₂ Atmospheres," *Corrosion Science*, 166 (15)108429 (7 pages), 2020.
15. K. Bawane, K. Lu, "Microstructure Evolution for Nanostructured Ferritic Alloy with and without Cr₃C₂ Coated Silicon Carbide at High Temperatures," *Journal of Materials Science and Technology*, 43(15) 126-134, 2020.
16. J. Zhao, H. Yang, Y. Li, K. Lu, "Photocatalytic Activity of CdS Nanoparticles Enhanced by the Interaction between Piezotronic Effect and Phase Junction," *Journal of Alloys and Compounds*, 815 (2020) 1524942 (9 pages).
17. N. Yang, M. Gao, J. Li, K. Lu, "Nickel Crystallite-Containing Magnetoceramics from Water Assisted Pyrolysis of Polysiloxane and Nickel 2,4-Pentanedionate," *Journal of the European Ceramic Society*, 103, 145–157, 2020.
18. K. Ning, K. Lu, H. Ju, "Sintering Behaviors of Micron-Sized Features Based on 3D Reconstruction," *Journal of Materials Science*, 54, 14635–14644, 2019.
19. K. Bawane, K. Lu, X. Bai, W.-Y. Chen, M. Li, "In-situ TEM Study of Microstructural Evolution in NFA and Cr₃C₂@SiC-NFA Composite during Ion Irradiation," *Materialia*, 7, 100412 (12 pages), 2019.
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35. K. Shen, K. Lu, "Comparison of Different Perovskite Cathodes in Solid Oxide Fuel Cells," *Fuel Cells*, 18(4), 2018, 457–465. DOI: 10.1002/fuce.201800044
36. K. Ning, H. Ju, K. Lu, "Effects of Ceramic Types on Evolution of Micron-Sized Features During Sintering," *Journal of the American Ceramic Society*, 102(2) 569-577, 2019.
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Conference Proceedings:

Technical papers:

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- Applications,” 2016 American Nuclear Society Winter Meeting Proceeding, ISBN: 978-0-89448-732-3.
2. K. Lu, W. Li, G. Li, “Understanding Diamond Nanoparticle Evolution During Zirconia Spark Plasma Sintering,” Proceeding of the 38th Int'l Conf & Expo on Advanced Ceramics & Composites (ICACC 2014), Daytona Beach, Florida, January 26-31, 2014. Editors: A. Gyekenyesi, M. Halbig.
 3. W. Li, M. Anderson, K. Lu, J. Y. Walz, “Fabrication of Porous Mullite by Freeze Casting and Sintering of Alumina-Silica Nanoparticles,” Advances in Synthesis, Processing, and Applications of Nanostructures, Proceeding of Materials Science & Technology 2011 Conference and Exhibit (MS&T '11), October 16-20, 2011, Columbus, OH, Ceramic Transactions, Vol 238, John Wiley & Sons, 2012, Editors: K. Lu, N. Manjooran, R. Murakami, G. Pickrell, page 57-64.
 4. K. Lu, B. Chen, “Single Nanometer TiO(2) Particle Synthesis and Soft Lithographic Molding,” Proceedings of 2011 NSF Engineering Research and Innovation Conference, Atlanta, Georgia, January 4-7, 2011.
 5. K. Lu, B. Chen, Z. Tian, “Directed Patterning: Focused Ion Beam Guided Anodization,” Proceedings of 2011 NSF Engineering Research and Innovation Conference, Atlanta, Georgia, January 4-7, 2011.
 6. W. Li, K. Lu, J. Y. Walz, “Freezing Behavior and Properties of Freeze Cast Kaolinite-Silica Porous Nanocomposite,” Ceramic Transactions, Proceeding of Materials Science & Technology 2010 Conference and Exhibit (MS&T '10), October 17-21, 2010, Houston, TX, John Wiley & Sons, 2011, p57-68.
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 12. K. Lu, C. Hammond, “Nanoparticle-based Bulk Material Templating,” Processing of Nanoparticle Structures and Composites: Ceramic Transactions, Vol. 208, 1-10, Editors: T. Hinklin, K. Lu, 2009, John Wiley & Sons.
 13. X. Zhu, K. Lu, H. Dong, C. Glomb, E. Logan, K. Nagarathnam, “Applying Nickel Nanolayer Coating onto B4C Particles for Processing Improvement,” 32nd International Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites, January, 2008, Daytona Beach, FL. Ceramic Engineering and Science Proceedings, 29(8), 117-129,

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Teaching papers:

1. C. B. Burgoyne, M. Roman, C. Evia, C. Suchicital, K. Lu, J. Jinscheck, "Work-in-Progress: Development and Implementation of a Web-Based Teaching Resource Site to Prepare International Teaching and Research Faculty for the American Classroom," Proceeding of ASEE/IEEE Frontiers in Education Conference (San Diego, CA, October 28-31, 2006), pp. M4G1-M4G2.
2. K. Lu, C. S. Kessler, "Nanotechnology Readiness among a Diverse Student Population," Proceeding of Mid-Atlantic Conference on the Scholarship of Diversity, Roanoke, VA, March 17-18, 2005.

Invited Talks:

1. K. Lu, S. Singh, "Structural evolution and electrical conductivity of polymer derived ceramics," TMS 2022 Annual Meeting & Exhibition, Anaheim, California, February 27–March 3, 2022.
2. K. Lu, "Silicon Oxycarbide Materials," Rutgers University Departmental Seminar, April

- 6, 2021.
3. K. Bawane, K. Lu, X.-M. Bai, K. Ning, W.-Y. Chen, M. Li, "High temperature corrosion and irradiation behavior of silicon carbide and nanostructured ferritic alloy composites," TMS 2021 Annual Meeting & Exhibition, virtual, March 14-18, 2021.
 4. K. Lu, J. Zheng, N. Yang, "Electrically conductive SiOC and TiC-SiOC nanocomposites via flash pyrolysis," 45th International Conference & Exposition on Advanced Ceramics & Composites (ICACC), Feb 8–12, 2021, virtual.
 5. K. Lu, "Polymer derived silicon oxycarbides - A new generation of novel materials," Webinar on Materials Science, Engineering and Technology, October 17, 2020.
 6. K. Lu, N. Yang, J. Zheng, "Effects of Transition Metals and External Field on the Evolution of Polymer-Derived Si-O-C ceramics," Materials Science and Engineering 2020 Conference, virtual, October 4-8, 2020.
 7. N. Yang, K. Lu, "Porous SiOC bulk ceramic based on perhydropolysilazane (PHPS) and polysiloxane (PSO) pyrolysis," 44th International Conference and Expo on Advanced Ceramics and Composites (ICACC 2020), Daytona Beach, FL, January 26-31, 2020.
 8. K. Lu, K. Bawane, N. Yang, "Polymer Derived Silicon Oxynitride (SiON) Coatings for Corrosion Protection of Steels," 44th International Conference and Expo on Advanced Ceramics and Composites (ICACC 2020), Daytona Beach, FL, January 26-31, 2020.
 9. K. Lu, N. Yang, D. Erb, "Polymer Derived Functional High Temperature Materials," 44th International Conference and Expo on Advanced Ceramics and Composites (ICACC 2020), Daytona Beach, FL, January 26-31, 2020.
 10. K. Lu, N. Yang, "Polymer Derived High Temperature Ti-SiOC," Materials Science & Technology 2019, Portland, Oregon, September 29-October 3, 2019.
 11. K. Lu, "Porous Silicon Oxycarbide Without Foreign Additives," Eleventh International Conference on High-Performance Ceramics (CICC-11), Kunming, China, May 25-29, 2019.
 12. K. Lu, "Phase Development of Silicon Oxycarbide Nanocomposites Under Different Conditions," Eleventh International Conference on High-Performance Ceramics (CICC-11), Kunming, China, May 25-29, 2019.
 13. K. Lu, K. Bawane, K. Ning, "Nanostructured Ferritic Alloy-Silicon Carbide Composites for Nuclear Applications," 2019 TMS Annual Meeting & Exhibition, San Antonio, Texas, March 10-14, 2019.
 14. K. Lu, D. Erb, L. Wang, and R. Ma, "Silicon Oxycarbide Through Flash Pyrolysis," 43rd International Conference and Exposition on Advanced Ceramics and Composites, Daytona Beach, FL, January 27-February 1, 2019.
 15. K. Lu, "Sintering Behaviors of Micron- and Submicron-sized Features," Lehigh University MSE Departmental Seminar speaker, March 27, 2018.
 16. K. Lu, Donald Erb, "Effect of Reactive Additives on Polysiloxane Derived SiOC Porous Ceramics," 42nd International Conference and Exposition on Advanced Ceramics and Composites, January 21-26, Daytona Beach, FL, 2018.
 17. K. Lu, H. Ju, "Sintering Behaviors of Micron- and Submicron-Sized ZnO Features," International Conference on Sintering 2017, San Diego, CA, November 12-16, 2017
 18. K. Lu, K. Ning, "SiC-NFA Composites for Nuclear Cladding Applications," Frontiers in Materials Processing Applications, Research and Technology, Bordeaux, France, July 9-12, 2017.
 19. K. Lu, D. Erb, "Additive and Pyrolysis Atmosphere Effects on High Surface Area Silicon Oxycarbides," Frontiers in Materials Processing Applications, Research and Technology, Bordeaux, France, July 9-12, 2017.

20. K. Lu, "Solid Oxide Fuel Cell Interconnect Coatings," 12th Pacific Rim Conference on Ceramic and Glass Technology, Waikaloa, HI, May 21-26, 2017.
21. K. Lu, "Polysiloxane-Derived Porous SiOC Ceramics," 12th Pacific Rim Conference on Ceramic and Glass Technology, Waikaloa, HI, May 21-26, 2017.
22. K. Lu, K. Ning, K. Bawane, "Fabrication of Novel NFA-SiC Composites for Nuclear Applications," AFC Integration Meeting, Oak Ridge, TN, March 28-30, 2017.
23. K. Lu, "Polymer Derived Ceramics and a World of Possibilities on Research, Education, and Friendship," Humboldt Colloquium: Global Research in the 21st Century: Perspectives of the U.S. Humboldt Network, Washington D.C., March 2-4, 2017.
24. K. Lu, "Material Needs and Developments in Energy Conversion, Harvesting, and Storage," Fifth Biennial Conference of the Combined Australian Materials Societies 2016, Melbourne, Australia, December 6-8, 2016 (Keynote).
25. K. Lu, "Understanding Current State of Materials Education for a Successful Career Tomorrow," Materials Science & Technology 2016, Salt Lake City, UT, October 23-27, 2016.
26. K. Lu, K. Shen, "Study of Cathodes and Interconnect Coatings for Solid Oxide Fuel Cells," Materials Day Symposium-Ceramics for Energy, Darmstadt, Germany, April 29, 2016.
27. K. Lu, K. Shen, "Perovskite-type Cathode Materials and Coatings for Solid Oxide Fuel Cells," 2016 145th TMS Annual Meeting & Exhibition, Nashville, TN, February 14-18, 2016.
28. K. Lu, "FIB Guided Anodization Patterning, Morphology Control, and Feature Array Transfer," University of North Carolina, Charlotte, 2/17/2016-2/18/2016.
29. K. Lu, "Growing Materials Education Diversity for a Successful Career Tomorrow," Materials Science and Engineering 2015 Conference, Columbus, OH, October 4-8, 2015.
30. K. Lu, Z. Tang, Z. Hu, "Silicon Carbide and Oxide Dispersion Strengthened Steel Cladding Materials for Nuclear Applications," Materials Science and Engineering 2015 Conference, Columbus, OH, October 4-8, 2015.
31. F. Shen, K. Lu, "Properties of Electrodeposition Co and Electrophoresis $\text{Sm}_{0.2}\text{Ce}_{0.8}\text{O}_{1.9}$ Protective Layer on AISI 441 for Solid Oxide Fuel Cells," Materials Science and Engineering 2015 Conference, Columbus, OH, October 4-8, 2015.
32. K. Lu, K. Shen, "Study of Different New Cathode Materials and Electrocatalyst Incorporation in Solid Oxide Fuel Cells," The 11th International Conference of Pacific Rim Ceramic Societies (PacRim-11), Jeju Island, South Korea, August 30-September 4, 2015.
33. K. Lu, F. Shen, " $(\text{La}_{0.6}\text{Sr}_{0.4})_x\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_3$ and Related Cathode Materials in Solid Oxide Fuel Cells," 2015 TMS 144th Annual Meeting & Exhibition, Walt Disney World, Orlando, FL, March 15-19, 2015.
34. K. Lu, "3D Microstructure Characterization of Nanoparticle-based Material Sintering," the International Conference on Sintering 2014, Dresden, Germany, August 24-28, 2014 (Keynote).
35. K. Lu, "Patterning, Morphology Control, and Feature Array Transfer through Focused Ion Beam Guided Anodization," University of Virginia, Charlottesville, VA, April 14, 2014.
36. K. Lu, M. Gervasio, "Formation and Characterization of Nanoparticle based Sub-micron Structures," 38th International Conference and Expo on Advanced Ceramics and Composites, Daytona Beach, FL, January 26-31, 2014.
37. K. Lu, "Development of a Nanoparticle-based Surface Templating Approach," 12th International Conference on Ceramic Processing Science, Portland, Oregon, August 4-7, 2013.

38. K. Lu, W. Li, "Different Cathode Interactions and Performance Behaviors in Solid Oxide Fuel Cells," 10th Pacific Rim Conference on Ceramic and Glass Technology, San Diego, California, June 2-7, 2013.
39. K. Lu, "Material Uses and Challenges in Solid Oxide Fuel Cells," Departmental seminar at Technische Universität Darmstadt, Darmstadt, Germany, November 2012.
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