

KI-TAE LEE

Chonbuk National University
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EDUCATION

- **Ph.D. in Materials Science and Engineering**, May 2006: The University of Texas at Austin.
Dissertation: "Development of Perovskite and Intergrowth Oxide Cathodes for Intermediate Temperature Solid Oxide Fuel Cells."
- **M.S. in Ceramic Engineering**, Feb 2000: Yonsei University, Korea.
Thesis: "Oxygen Ion Conductivity and Single Cell Performance of $\text{La}(\text{Ba})\text{Ga}(\text{Mg})\text{O}_{3-\delta}$ Perovskite Oxide."
- **B.S. in Ceramic Engineering**, Feb 1998: Yonsei University, Korea.

DISTINCTIONS

- Young Engineering Professors Award, Chonbuk National University. 2010
- University Continuing Fellowship, The University of Texas at Austin. 2005 - 2006
- Pre-Emptive Recruitment Fellowship, The University of Texas at Austin. 2002 - 2003
- Grant for the Mechanical-Electrical-Material (MEM) Special Graduate Program Students at the University of Tokyo, The Ministry of Education, Science, Sports and Culture, Japan. 2000
- Full Scholarship for Highest Academic Merit, Yonsei University, Korea. 1995 - 1996

RESEARCH EXPERIENCE

- **Assistant Professor**, Advanced Materials Engineering, Chonbuk National University. Sep 2007 - present
* Developing novel materials for IT-SOFC, ion conducting membrane, thermoelectric materials.
- **Senior Engineer**, Corporate Research and Development, Samsung SDI Co., Ltd. 2007:
* Developed novel cathode materials for high power Li-ion batteries.
- **Research Fellow**, Texas Materials Institute, The University of Texas at Austin. 2006:

- * Developed novel cathode and anode materials for intermediate temperature solid oxide fuel cell. Funded by Welch Foundation.
- * Developed, synthesized, and characterized metal and oxide nano-powders with low-temperature, soft-chemistry techniques. Funded by RBC Co.
- **Research Scientist**, Ceramic Processing Research Center, Korea Institute of Science and Technology (KIST). 2000 - 2001:
 - * Developed sol-gel synthesis of organic-inorganic hybrid material. Funded by KIST.
 - * Developed electrode materials and system for solid oxide fuel cell. Funded by KIST.

AFFILIATION

- Member of The Korean Ceramic Society
- Member of The Korean Sensors Society
- Member of The Korean Electrochemical Society
- Active member of The Electrochemical Society

PUBLICATIONS

39. A. Manthiram, J.H. Kim, Y.N. Kim, and K.T. Lee, "Crystal Chemistry and Properties of Mixed Ionic-Electronic Conductors," *J. Electroceram.*, DOI: 10.1007/s10832-011-9635.
38. J.Y. Yoo, I.J. Shon, B.H. Choi, and K.T. Lee, "Characterization of BaZr_{0.8}Y_{0.2}O_{3-δ} proton-conducting electrolyte material synthesized by pulsed-current activated sintering," *J. Ceram. Pro. Res.*, (2011) in press.
37. J.Y. Yoo, I.J. Shon, B.H. Choi, and K.T. Lee, "Fabrication and characterization of a Ni-YSZ anode support using high-frequency induction heated sintering (HFIHS)," *Ceram. Int.*, 37 (2011) 2569-2574.
36. J.Y. Yoo, C.K. Cho, I.J. Shon, and K.T. Lee, "Preparation of porous Ni-YSZ cermet anodes for solid oxide fuel cells by high frequency induction heated sintering," *Mater. Lett.*, 65 (2011) 2066-2069.
35. M.K. Rath, S.K. Acharya, B.H. Kim, K.T. Lee, and B.G. Ahn, "Photoluminescence properties of sesquioxide doped ceria synthesized by modified sol-gel route," *Mater. Lett.*, 65 (2011) 955-958.
34. J.H. Kim, K.T. Lee, Y.N. Kim, and A. Manthiram, "Crystal chemistry and electrochemical properties of Ln(Sr,Ca)₃(Fe,Co)₃O₁₀ intergrowth oxide cathodes for solid oxide fuel cells," *J. Mater. Chem.*, 21 (2011) 2482-2488.

33. K.W. Song and K.T. Lee, "Characterization of $\text{Pb}_2\text{Ru}_{2-x}\text{Bi}_x\text{O}_7$ ($x = 0, 0.2, \text{ and } 0.4$) pyrochlore oxide cathode materials for intermediate temperature solid oxide fuel cells," *J. Ceram. Pro. Res.*, **12(1)** (2011) 30-33.
32. K.W. Song and K.T. Lee, "Characterization of $\text{NdSrCo}_{1-x}\text{Fe}_x\text{O}_{4+\delta}$ ($0 \leq x \leq 1.0$) intergrowth oxide cathode materials for intermediate temperature solid oxide fuel cells," *Ceram. Int.*, **37(2)** (2011) 573-577.
31. H.K. Park, J.H. Park, J.K. Yoon, K.T. Lee, and I.J. Shon, "One step synthesis and densification of nanocrystalline $\text{TaSi}_2\text{-Si}_3\text{N}_4$ composite from mechanically activated powders by high-frequency induction-heated combustion," *J. Electroceram.*, **23** (2009) 542-547.
30. B.R. Kim, K.S. Nam, J.M. Doh, K.T. Lee, and I.J. Shon, "Rapid synthesis and consolidation of TiSi_2 by pulsed activated combustion," *J. Ceram. Pro. Res.*, **10** (2009) 171-175.
29. K.T. Lee, D.K. Kim, J.H. Park, I.J. Shon, "Effect of Fe_2O_3 on properties and densification of $\text{Ce}_{0.8}\text{Gd}_{0.2}\text{O}_{2-\delta}$ by PCAS," *Ceram. Int.*, **35** (2009) 1345-1351.
28. I.J. Shon, I.K. Jeong, J.H. Park, B.R. Kim, and K.T. Lee, "Effect of Fe_2O_3 addition on consolidation and properties of 8 mol% yttria-stabilized zirconia by high-frequency induction heated sintering (HFIHS)," *Ceram. Int.*, **35** (2009) 363-368.
27. I.J. Shon, D.K. Kim, K.T. Lee, K.S. Nam, "Properties and consolidation of nanostructured $\text{Ce}_{0.8}\text{Gd}_{0.2}\text{O}_{1.9}$ by pulsed-current-activated sintering," *Met. Mater. Int.*, **14** (2008) 593-598.
26. I.J. Shon, I.K. Jeong, J.H. Park, K.S. Nam, K.T. Lee, and K.D. Woo, "Properties and rapid consolidation of WC-based hard materials with various binders by a pulsed current activated sintering method," *J. Ceram. Pro. Res.*, **9** (2008) 512-516.
25. I.J. Shon, H.K. Park, and K.T. Lee, "Characterization of nanostructured $\text{Ce}_{0.8}\text{Sm}_{0.2}\text{O}_{2-\delta}$ prepared by pulsed current activated Sintering," *J. Ceram. Pro. Res.*, **9** (2008) 325-329.
24. K.T. Lee and A. Manthiram, "Effect of cation doping on physical properties and electrochemical performance of $\text{Nd}_{0.6}\text{Sr}_{0.4}\text{Co}_{0.8}\text{M}_{0.2}\text{O}_{3-\delta}$ ($\text{M} = \text{Ti, Cr, Mn, Fe, Co, and Cu}$) cathodes," *Solid State Ionics*, **178** (2007) 995-1000.
23. K.T. Lee and A. Manthiram, "Electrochemical performance of $\text{Nd}_{0.6}\text{Sr}_{0.4}\text{Co}_{0.5}\text{Fe}_{0.5}\text{O}_{3-\delta}$ -Ag composite cathodes for intermediate temperature solid oxide fuel cells," *J. Power Sources*, **160** (2006) 903-908.
22. K.T. Lee, D.M. Bierschenk, and A. Manthiram, " $\text{Sr}_{3-x}\text{La}_x\text{Fe}_{2-y}\text{Co}_y\text{O}_{7-\delta}$ ($0.3 \leq x \leq 0.6$ and $0 \leq y \leq 0.6$) intergrowth oxide cathodes for intermediate temperature solid oxide fuel cells," *J. Electrochem. Soc.*, **153** (2006) A1255-A1260.
21. K.T. Lee and A. Manthiram, " $\text{LaSr}_3\text{Fe}_{3-y}\text{Co}_y\text{O}_{10-\delta}$ ($0 \leq y \leq 1.5$) intergrowth oxide cathodes for intermediate temperature solid oxide fuel cells," *Chem. Mater.*, **18** (2006) 1621-1626.

20. K.T. Lee and A. Manthiram, "Comparison of $\text{Ln}_{0.6}\text{Sr}_{0.4}\text{CoO}_{3-\delta}$ (Ln = La, Pr, Nd, Sm, and Gd) cathode materials for intermediate temperature solid oxide fuel cells," *J. Electrochem.Soc.*, **153** (2006) A794-A798.
19. K.T. Lee and A. Manthiram, "Synthesis and characterization of $\text{Nd}_{0.6}\text{Sr}_{0.4}\text{Co}_{1-y}\text{Mn}_y\text{O}_{3-\delta}$ ($0 \leq y \leq 1.0$) cathode materials for intermediate temperature solid oxide fuel cells," *J. Power Sources*, **158** (2006) 1202-1208.
18. K.T. Lee and A. Manthiram, "Investigation of $\text{Nd}_{0.6}\text{Sr}_{0.4}\text{Co}_{1-y}\text{M}_y\text{O}_{3-\delta}$ (M = Fe and Mn) as cathode materials for intermediate temperature solid oxide fuel cells," *Ceramic Transactions: Advances in Electronic and Electrochemical Ceramics* (F. Dogan and P.N. Kumta, Eds.), Vol. 179, American Ceramic Society, Westerville, OH, (2005) pp. 131-138.
17. K.T. Lee and A. Manthiram, "Characterization of $\text{Nd}_{0.6}\text{Sr}_{0.4}\text{Co}_{1-y}\text{Fe}_y\text{O}_{3-\delta}$ ($0 \leq y \leq 0.5$) cathode materials for intermediate temperature solid oxide fuel cells," *Solid State Ionics*, **176** (2005) 1521-1527.
16. K.T. Lee and A. Manthiram, "Characterization of $\text{Nd}_{1-x}\text{Sr}_x\text{CoO}_{3-\delta}$ ($0 \leq x \leq 0.5$) cathode materials for intermediate temperature solid oxide fuel cells," *J. Electrochem.Soc.*, **152** (2005) A197-A204.
15. K.T. Lee and A. Manthiram, "Characterization of Sr-doped neodymium cobalt oxide cathode materials for intermediate temperature solid oxide fuel cells," *Ceramic Transactions: Development in Solid Oxide Fuel Cells and Lithium Ion Batteries* (A. Manthiram, P.N. Kumta, S.K. Sundaram, and S. Chan, Eds.), Vol. 161, American Ceramic Society, Westerville, OH, (2004) pp. 3-12.
14. S. Kim, K.T. Lee, and H.L. Lee, "Phase relationship of barium and magnesium doped LaGaO_3 oxides," *Mater. Lett.*, **52** (2002) 342-349.
13. K.T. Lee, S. Kim, G.D. Kim, and H.L. Lee, "Electrical conduction behavior of Ba^{2+} and Mg^{2+} doped LaGaO_3 perovskite oxide," *J. Applied Electrochem.*, **31** (2001) 1243-1249.
12. J.W. Moon, G.D. Kim, K.T. Lee, and H.L. Lee, "Effect of YSZ particle size and sintering temperature on the microstructure and impedance property of Ni-YSZ anode for solid oxide fuel cell," *J. Korean Ceram. Soc.*, **38(5)** (2001) 466-473.
11. J.D. Kim, G.D. Kim, and K.T. Lee, "Oxygen reduction mechanism and electrode properties of (La,Sr) MnO_3 -YSZ composite cathode for solid oxide fuel cell (part II: electrode properties)," *J. Korean Ceram. Soc.*, **38(1)** (2001) 93-99.
10. J.D. Kim, G.D. Kim, and K.T. Lee, "Oxygen reduction mechanism and electrode properties of (La,Sr) MnO_3 -YSZ composite cathode for solid oxide fuel cell (part I: oxygen reduction mechanism)," *J. Korean Ceram. Soc.*, **38(1)** (2001) 84-92.
9. S. Kim, M.C. Chun, K.T. Lee, and H.L. Lee, "Oxygen-ion conductivity of BaO- and MgO-doped LaGaO_3 electrolytes," *J. Power Sources*, **93** (2001) 279-284.

8. K.T. Lee and G.D. Kim, "Cathode materials for ceramic fuel cells," *The Monthly Magazine for Ceramics*, **14(155)** (2001) 77-79.
7. J.D. Kim, G.D. Kim, J.W. Moon, H.W. Lee, K.T. Lee, and C.E. Kim, "The effect of percolation on electrochemical performance," *Solid State Ionics*, **133** (2000) 67-77.
6. J.D. Kim, G.D. Kim, and K.T. Lee, "Effect of Co dopant on the (La,Sr)MnO₃ cathode for solid oxide fuel cell," *J. Korean Ceram. Soc.*, **37(6)** (2000) 612-616.
5. S.M. Choi, K.T. Lee, S. Kim, M.C. Chun, and H.L. Lee, "Oxygen ion conductivity and cell performance of La_{0.9}Ba_{0.1}Ga_{1-x}Mg_xO_{3-δ} electrolyte," *Solid State Ionics*, **131** (2000) 221-228.
4. K.T. Lee, J.D. Kim, and G.D. Kim, "Electrode properties and reaction mechanism of cathode for solid oxide fuel cell," *Ceramist*, **3(5)** (2000) 56-65.
3. K.T. Lee, S. Kim, and H.L. Lee, "Phase formation and oxygen ion conduction of La(Ba)Ga(Mg)O_{3-δ} perovskite oxide system," *J. Korean Ceram. Soc.*, **36(10)** (1999) 1056-1061.
2. S.M. Choi, K.T. Lee, K.Y. Kim, S. Kim, and H.L. Lee, "Oxygen ion conductivity and power density of LaGaO₃ alternative electrolytes for ceramic fuel cell," *J. Korean Ceram. Soc.*, **36(9)** (1999) 909-914.
1. K.Y. Kim, K.T. Lee, S. Kim, and H.L. Lee, "Phase formation and electrical property in La(Sr)Ga(Al)O_{3-δ} perovskite oxide," *J. Engineering Research Institute Yonsei Univ.*, **31(1)** (1999) 25-34.