Curriculum Vitae

Rudder Wu

Nationality: Canadian

BASc, PhD, Researcher

National Institute for Materials Science, Japan

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EDUCATION

2006 – 2009 **Imperial College London, United Kingdom**
Earned a PhD degree in Materials Science,
Research topic: Thermal Barrier Coatings
Supervisors: Professor Roger Reed and Professor Alan Atkinson

2005 - 2006 **Imperial College London, United Kingdom**
Completed MPhil-PhD Transfer,
Advisors: Professor Roger Reed

2000 - 2005 **University of British Columbia, Canada**
Obtained a Bachelor's degree in Materials Engineering,

CAREER

2015 – Present **International Center for Materials Nanoarchitectonics (WPI-MANA), National Institute for Materials Science, Japan**
Research topics:
1. Advanced Thermal Insulation Coatings
2. High Temperature Functional Coatings for Aerospace Applications
3. Materials Strategies for Rare-earth and Precious-metals Substitution

2011 – 2015 **Global Research Center for Environment and Energy based on Nanomaterials Science (GREEN), National Institute for Materials Science, Japan**
Researcher, Research topics: thermal insulation materials; advanced Thermal Barrier Coatings

2009 – 2011 **International Center for Young Scientists (ICYS), National Institute for Materials Science, Japan**
ICYS Researcher

INDUSTRIAL R&D (INTERNSHIP) EXPERIENCE

2004-2005	**High Temperature Materials Center-NIMS, Japan**
	Position: Research Assistant (8 Months)
2003	**Placer Dome Research Center, Canada**
	Position: Researcher (4 Months)
2002	**IPSCO R&D Center, Canada**
	Position: Research Assistant (4 Months)
2002	**Natural Science and Engineering Research Council of Canada (NSERC), Canada**
	Position: Research Assistant (4 Months)

Awards and Scholarships

2015 (CHINA)	XTU Fellowship Award for Young Scholars
2009-2011 (JAPAN)	ICYS Fellowship
2009 (USA)	TMS (The Materials Society) Structural Materials Division Annual Award
2008 (UK)	Imperial College London Postgraduate Research Day –1st Place in Industrial Relevance Award
2007-2008 (CANADA)	Natural Sciences and Engineering Research Council of Canada (NSERC) Postgraduate Research Scholarship – PhD Level
2005-2008 (UK)	Overseas Research Students Award
2005-2006 (CANADA)	NSERC Postgraduate Research Scholarship – Master's Level
2004-2005 (USA)	TMS (The Materials Society) International Research Paper Contest – 1st Place
2004 (CANADA)	USP Scholarship, University of British Columbia
2003 (CANADA)	International Conference of Metallurgists 2003 – Best Poster Award
2003 (CANADA)	Association of Professional Engineering and Geologists BC-MAPS Scholarship Award
2002 (CANADA)	NSERC Research Award
2002 (CANADA)	Canada Millennium Scholarship
2001 (CANADA)	John H. Reid Scholarship, Materials Engineering, University of British Columbia (Canada)

Selected Publications (All Peer-reviewed)

1. "A Simple Approach in the Synthesis of Geometrically Tunable Nano-size Hollow Silicate Particles and the evaluation for Thermal Energy Saving Applications," R. T. Wu, R. Virtudazo, T. Mori, MRS Advances, 2016, Available on CJO 2016 doi:10.1557/adv.2016.333

2. "Development of micro / nano-size hollow silicate particles for thermal energy saving application," R. Virtudazo, R.T. Wu, T. Mori, MRS Advances, 2016, Available on CJO 2016 doi:10.1557/adv.2016.309

3. "Synthesis and characterization of geometrically tunable nano-size hollow silicate particles and their dip-coating prepared films for thermal management applications," R. Virtudazo, Y. Lin, R. Wu, RSC ADVANCES 5[126], 2015, 104408-104416 DOI:10.1039/C5RA18267K

4. "Effect of platinum addition on oxidation behaviour of gamma/gamma prime nickel aluminide," Y. Chen, X. Zhao, M. Bai, A. Chandio, R. Wu, P. Xiao, Acta Mater. 86 (2015) 319-330 DOI:10.1016/j.actamat.2014.12.023

5. "Multiscale Assembly of Superinsulating Silica Aerogels Within Silylated Nanocellulosic Scaffolds: Improved Mechanical Properties Promoted by Nanoscale Chemical Compatibilization," S. Zhao, Z. Zhang, Gilles Sèbe, R.T. Wu, R. Virtudazo, P. Tingaut, M. Koebel, Advanced Functional Materials, Vol. 25, pp.2326-2334, 2015

6. “Nano-quasi-grating of optical diffraction on special stainless steel by a femtosecond-pulsed laser,” C.K. Kuo, S.W. Luo, H.Y. Tsai, S.H. Wang, R.T. Wu, M.C. Chou, T.R. Tsai, M.C. Shieh, Y.C. Yang, K. Huang, Materials Letters, Vol. 138, pp.29-32, 2015

7. “Effect of platinum addition on oxidation behaviour of gamma/gamma prime nickel aluminide,” Y. Chen, X. Zhao, M. Bai, A. Chandio, R.T. Wu, P. Xiao, Acta Materialia, Vol. 86, pp. 319-330, 2015

8. “An Experimental Study on Exploring the Possibility of Applying Artificial Light as Radiation in Wind Tunnel,” Ye Lin, Toshiaki Ichinose, R.T. Wu, Y. Yamao, H. Mouri, R.V. Virtudazo, Journal of Heat Island Institute International, Vol. 9-2, pp.108-112, 2014

9. “Mechanisms and mitigation of volcanic ash attack on yttria stabilized zirconia thermal barrier coatings,” Kuan-I Lee, Liberty T. Wu, R.T. Wu, Ping Xiao, Surface and Coatings Technology, Vol. 260, pp.68-72, 2014

10. “Microstructure parameters affecting interfacial adhesion of thermal barrier coatings by the EB-PVD method,” L. Wu, R.T. Wu, X. Zhao, P. Xiao, Mater. Sci. Eng. A-Struct. Mater. Prop. Microstruct. Process, Vol. 594, pp.193-202, 2014

11. “Facile ambient temperature synthesis and characterization of a stable nano-sized hollow silica particles using soluble-poly(methacrylic acid) sodium salt templating,” R. Virtudazo, R.T. Wu, S. Zhao, M. Koebel, Materials Letters, Vol. 126, pp.92-96, 2014

12. “Effect of Pt on adherence of γ′-Ni3Al/Al2O3 interface of thermal barrier coatings investigated by first-principle molecular dynamics,” Y. Nie, R.T. Wu, R. Reed, Y. Chen, K. Lee, Mater. Res. Innov, Vol. 18-S2, pp.S2-1001-S2-1007, 2014

13. “Synthesis of an Oxidation Resistant Coating for Ni-based High Temperature Structural Materials by Dip Coating,” Wan-Ting CHEN, R.T. Wu, K. Chien, L. Wu, G. Hong, H. Harada, Applied Mechanics and Materials, Vol. 187[2012], pp.251-254, 2012

14. “Thermodynamic assessment of ternary NiCrAl alloys: from calculations to experiments,” R.T. Wu, R Zhu, L T Wu, Y M Nie, R C Reed, K Kawagishi and H Harada, Can. Metall. Q., Vol. 50[3], pp.291-294, 2011

15. “On the interfacial degradation mechanisms of thermal barrier coating systems: Effects of bond coat compositions,” R.T. Wu, X. Wang, A. Atkinson, Acta Materialia Volume 58, pp. 5578-5585, 2010

16. “Degradation Mechanisms of an Advanced Jet Engine Service-Retired TBC Component,” R.T. Wu, Makoto Osawa, Tadaharu Yokokawa, and Hiroshi Harada, Journal of Solid Mechanics and Materials Engineering, Vol. 4, pp.119-130, 2010

17. “Characterisation of residual stress and interface degradation in TBCs by photo-luminescence piezo-spectroscopy,”X. Wang, R.T. Wu, A. Atkinson, Surface and Coatings Technology Vol. 204, pp. 2472-2482, 2010

18. “On oxidation behaviour of platinum aluminide coated nickel based superalloy CMSX-4,” R. C. Reed, R.T. Wu, M.S. Hook, C.M.F. Rae, and R.G. Wing, Materials Science and Technology, Vol. 25, pp. 276-286, 2009

19. “The retention of thermal barrier coating systems on single-crystal superalloys: Effects of substrate composition,” R.T. Wu, K. Kawagishi, H. Harada, R.C. Reed, Acta Materialia Vol. 56, pp. 3622-3629, 2008

20. “An Investigation of the Compatibility of Nickel-based Single Crystal Superalloys with Thermal Barrier Coating Systems,” R.T. Wu, R.C. Reed, K. Kawagishi, H. Harada, the Eleventh International Symposium on Superalloys 2008, pp. 769-775, 2008

21. “On the compatibility of single crystal superalloys with a thermal barrier coating system,” R.T. Wu, R.C. Reed, Acta Materialia Vol. 56, Pages 313-323, 2008

22. “A critique of rhenium clustering in Ni-Re alloys using extended X-ray absorption spectroscopy,” A. Mottura, R.T. Wu, M.W. Finnis, R.C. Reed, Acta Materialia Vol. 56, pp. 2669-2675, 2008

23. “On the Compatibility of Nickel-Based Single Crystal Superalloys with Coating Systems,” R.T. Wu, R.C. Reed, K. Kawagishi, H. Harada, R. Wing, 7th International Charles Parsons Turbine Conference – Proceedings 2007.

24. “An Investigations of the Degradation Mechanisms of a Civilian Aircraft High Temperature and Pressure Nozzle

Guide Vane – Approaches from the Aspects of Materials Science," M. Osawa, R.T. Wu, H. Harada, T. Yokokawa, Japan Gas Turbine Society, pp.191-195, Vol. 33, No. 3, 2005

25. "民間機エンジン高温高圧タービン翼のコーティング損傷解析事例", 耐熱金属材料 123 委員会研究報告, Vol.46, No. 3, pp. 287-291, 2005, R.T. Wu, 原田広史, 大沢真人, 横川忠晴

26. "Investigation of the In-Service Degradation Mechanism of a Modern Thermal Barrier Coating," R.T. Wu, M. Osawa, Y. Koizumi, H. Harada, S. Sugiura, Tsukuba International Coatings Symposium – Proceedings, Vol. 32-33, 2004

27. "Electrical conductivity and density of NiSO4/H2SO4 solutions in the range of modern nickel electrorefining and electrowinning electrolytes," R.T. Wu, M. Oliazadeh, A.M. Alfantazi, Journal of Applied Electrochemistry, Vol. 33: 1043-1047, 2003

28. "Application of solvent extraction for the separation of molybdenum from nano-crystalline cobalt electrodeposition effluents," M. Oliazadeh, R.T. Wu, J.H. Huang, A.M. Alfantazi, CIM 2002 Conference Proceeding. 2002

Co-authored Book

Thermal Barrier Coatings

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Patents

R.T. Wu, K. Kawagishi, K. Matsumoto, H. Harada

Name of Invention: "Heat Resistant Coating,"

Japanese patent 2010-096554, filed by National Institute for Materials Science Japan on April 20, 2010, followed by PCT International Patent.

国内登録特許: 特許第 5660428 号 "耐熱コーティング材" (2014)

国際特許: No.US20130095346A1 "HEAT-RESISTANT COMPONENT" (2013)

国際特許: No.WO2011132596A1 "HEAT RESISTANT MEMBER" (2011)

Professional Affiliations

Since 2004	Member, the Minerals, Metals, & Materials Society (TMS), USA
Since 2005	Members, the Institute of Materials, Minerals and Mining (IOM3), UK
Since 2010	Members, the Members, The Japan Institute of Metals (JIM), Japan