CURRICULUM VITAE

◆ PERSONAL INFORMATION

Name: Hongchao WANG **Gender:** Male

Date of Birth: Aug.30, 1983 **Place of Birth:** Shandong Province, P. R. China

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◆ ADDRESS FOR CORRESPONDENCE:

School of Physics, Shandong University, Jinan 250100, P. R. China

◆ EDUCATION BACKGROUD

- **Sep. 2006-July. 2011:** Doctor of Engineering, Shandong University, Major in Material Physics and Chemistry, Supervisor: Prof. Chunlei WANG
- **Sep. 2002-July. 2006:** Bachelor of Science, Ludong University, Major in Physics, Supervisor: Prof. Xiuwei XU

◆ RESEARCH INTERESTING

- Oxide thermoelectric materials
- Oxide thermoelectric modules

◆ Research Done During PhD Study

During PhD study, environmental friendly oxide thermoelectric materials as the object are chosen to research. The thermoelectric properties of several typical oxides have done deeply research, and we tentative explore the idea and fabrication of thermoelectric generation module with whole ceramics. $LaFeO_3$, $SrTiO_3$, $CaMnO_3$-based thermoelectric materials are respectively prepared using conventional solid state reaction techniques. The microstructures of these thermoelectric materials are observed with XRD and SEM. The electrical resistivity and Seebeck coefficients are measured respectively with self-made equipments or ZEM-3. Their thermal conductivities are measured by TC-7000 or LFA-427. The main research contents includes modifying the thermoelectric transport behavior by optimizing chemical composition and

technological conditions, final improving the thermoelectric properties and searching for the physical mechanism of the electric heat transport for the oxide materials. On this basis, a π-shaped thermoelectric power module has been fabricated using P-typed $Ca_3Co_4O_9$-based units and N-typed $SrTiO_3$-based units, and investigated the property of this module. Through these researches mentioned above, we have achieved some major innovations

◆ RESEARCH PROJECTS

- The Graduate Independent Innovation Foundation of Shandong University, Designation and verification of ceramic thermoelectric modulus for power generation, 2009.12-2011.07. 10,000RMB (**Principle Investigator**)
- Academic Creative Scholarship Foundation for Doctors of Ministry of Education, The investigation of oxide thermoelectric materials, 2010.09-2011.07. 30,000RMB (**Principle Investigator**)
- Excellent Doctoral Cultivation Fund of Shandong University, 2010.09-2011.07. 10,000RMB (**Principle Investigator**)
- The State Key Development Program for Basic Research of China (973), Electrical and thermal transportation mechanism in thermoelectrics, 2007.01-2011.12. 2,400,000RMB (**Participator**)
- National Natural Science Fund of China, Investigation on thermoelectric properties of new Co_2O_3-based compounds of alloy and oxide phases, 2010.01-2012.12. 200,000RMB (**Participator**)
- National Natural Science Fund of China, The components, structure and properties of new ultra-high temperature piezoelectric ceramic materials, 2008.01-2010.12. 190,000RMB (**Participator**)
- Shandong Province Natural Science Foundation, China, The investigation of new perovskite thermoelectric ceramics, 2010.01-2012.12. 30,000RMB (**Participator**)

◆ PROFESSIONAL SKILLS

- Familiar with the conventional solid-state reaction method, especial the reducing firing technology.

- Familiar with the characterization instruments, such as XRD, SEM, TEM, and Hall measurements.
- Familiar with the mechanisms and operation of electrical transport properties measurement equipments and thermal analyzers DSC and LFA.
- English: Good at listening, speaking, reading and writing.
- Computer Skills: Familiar with general official and tools software.

◆ HONORS AND AWARDS

- 2011.05 May-4th Young Scientist Award of Shandong University
- 2011.04 Honors Graduate of Shandong Province
- 2011.04 Honors Graduate of Shandong University
- 2010.11 Excellent Doctoral Breeding Program of Shandong University
- 2010.11 Guanghua Scholarship For Excellent Student of Shandong University
- 2010.09 Academic Creative Scholarship For PhD Students By Ministry of Education
- 2009.10 Social Practice Scholarship of Shandong University
- 2009.10 Honors Graduate Student of Shandong University
- 2009.10 Honors Graduate Student Cadre of School of Physics
- 2008.10 Honors Graduate Student Cadre of School of Physics

◆ SELF-EVLUATION

I have innovation ability of scientific research; and ability of designing experiments independently and in-depth theoretical analysis as well. And my scientific research quality is higher. Meanwhile, I have collective concept with the ability of organization and coordination, my teamwork spirit and ability is strengthened during several years' study which is conducive to scientific research team building and running. All in all, I am honest, easy-going, communicative, and diligent in thinking.

◆ PAPER LIST

1. **H.C. Wang**, C.L. Wang, W.B. Su, J. Liu, Y. Sun, H. Peng and L.M. Mei, Doping effect of La and Dy on thermoelectric properties of $SrTiO_3$, **J. Am. Ceram. Soc.** 94 (2011) 838
2. **H.C. Wang**, C. L. Wang, W. B. Su, J. Liu, Y. Sun, H. Peng, J. L. Zhang, M. L. Zhao, J. C. Li and L. M. Mei, Synthesis and high thermoelectric properties of Ta doped $Sr_{0.9}La_{0.1}TiO_3$ ceramics, **Ceram. Intern.** 37 (2011) 2609.
3. **H.C. Wang**, C.L. Wang, W.B. Su, J. Liu, Y. Sun, H. Peng, J.L. Zhang, M.L. Zhao, J.C. Li, N. Yin and L.M. Mei, Synthesis and electrical properties of dual doped $CaMnO_3$ based ceramics, **Acta Phys. Sin.** 60 (2011) 080000 (In Chinese)
4. **H.C. Wang**, C.L. Wang, W.B. Su, J. Liu, Y. Zhao, H. Peng, J.L. Zhang, M.L. Zhao, J.C. Li, N. Yin and L.M. Mei, Enhancement of thermoelectric figure of merit by doping Dy in $La_{0.1}Sr_{0.9}TiO_3$ ceramic, **Mater. Res. Bull.** 45 (2010) 809
5. **H.C. Wang**, C.L. Wang, J.L. Zhang, W.B. Su, J. Liu, M.L. Zhao, N. Yin, Y.G. Lv and L.M. Mei, Influence of Sr substitution on thermoelectric properties of $La_{1-x}Sr_xFeO_3$ ceramics, **Curr. Appl. Phys.** 10 (2010) 866.
6. **Hongchao Wang,** Chunlei Wang, Wenbin Su, Jian Liu, Yue Zhao, Hua Peng, Jialiang Zhang, Minglei Zhao, Jichao Li, NaYin, Liangmo Mei, Influence of sintering temperature on the thermoelectric properties of $La_{0.9}Sr_{0.1}FeO_3$ ceramics，**Acta Phys. Sin.** 59 (2010) 0529 (In Chinese)
7. **H. C. Wang**, C.L. Wang, W.B. Su, J. Liu, H. Peng, J.L. Zhang, M.L. Zhao, J.C. Li, N. Yin and L.M. Mei, Substitution effect on the thermoelectric properties of reduced Nb-doped $Sr_{0.95}La_{0.05}TiO_3$ ceramics, **J. Alloy Compd.** 486 (2009) 693.
8. **Wang Hong-Chao**, Wang Chun-Lei, Zhang Jia-Liang, Zhao Ming-Lei, Liu Jian, Su Wen-Bin, Yin Na and Mei Liang-Mo, Cu doping effect on the electrical resistivity and Seebeck coefficient of perovskite-type $LaFeO_3$ Ceramics, **Chin. Phys Lett.** 26 (2009) 107301.
9. **H.C. Wang**, C. L. Wang, W. B. Su, J. Liu, Y. Sun, H. Peng, J. L. Zhang, M. L. Zhao, J. C. Li and L. M. Mei, High-temperature thermoelectric properties of Yb-doped $La_{0.1}Sr_{0.9}TiO_3$ ceramics, **Solid State Sci.** Under Review

10. J. Liu, **H.C. Wang**, W.B. Su, C.L. Wang, J.L. Zhang, L.M. Mei, Synthesis and thermoelectric properties of $Sr0_{.95}La_{0.05}TiO_{3-\delta}$-$TiO_2$ solid solutions, **Solid State Sci.**12 (2010) 134

11. Na Yin, **Hong-chao Wang**, Chun-lei Wang, Synthesis, Electrical Resisitivity and Seebeck Coefficient of $La_{0.9}A_{0.1}FeO_3$ (A= Mg, Ca, Sr, Ba), **J. Mater. Sci. Technol.** 26 (2010) 1103

12. Yin Na, **Wang Hongchao**, Wang Chunlei, Effect of sintering temperature on the morphology and the arc erosion properties of La-Ni-O ceramic and its contact material, **J. Rare Earths** 27 (2009) 506.

13. C. L. Wang ,**H. C. Wang,** Y. Sun, W. B. Su, J. Liu, H. Peng, L. M. Mei, Thermoelectric power module from oxide ceramics, **J. Elec. Mater.** Under Review.

14. Y. Sun, C.L. Wang, **H.C. Wang**, H. Peng, F.Q. Guo, W.B. Su, J. Liu, J.C. Li, L.M. Mei, Yttrium doped effect on thermoelectric properties of $La_{0.1}Sr_{0.9}TiO_3$ ceramics, **J. Mater. Sci.** 46 (2011) 5278.

15. W. B. Su, C. L. Wang, **H. C.Wang**, J. Liu, P. Zheng, J. L. Zhang, Thermopower of an oxide-alloy composite system obtained by in situ carbothermal synthesis, **J. Elec. Mater.** 40 (2011) 1190.

16. J. Liu, C. L. Wang, W. B. Su, **H. C. Wang**, J. C. Li, J. L. Zhang, L. M. Mei, Thermoelectric properties of $Sr_{1-x}Nd_xTiO_3$ ceramics, **J. Alloy Compd.** 492 (2010) L54

17. H. Peng, C. L.Wang, J. C. Li, **H. C. Wang**, M. X. Wang, Theoretical investigation of the electronic structure and thermoelectric transport property of Mg_2Si，**Acta Phys. Sin.**, 59 (2010) 252 (In Chinese)

18. J. Liu, C. L. Wang, W. B. Su, **H. C. Wang**, P Zheng, J. C. Li, J. L. Zhang, L. M. Mei, Enhancement of thermoelectric efficiency in oxygen-deficient $Sr_{1-x}La_xTiO_{3-\delta}$ ceramics, **Appl. Phys. Lett.** 95 (2009) 162110

19. Y. G. Lv, Y. Dai, C. L. Wang, **H. C. Wang**, Influence of compositional ratio K/Na on properties in KNNT ceramics, **Science in China Series G** 10 (2009) 1454 (In Chinese)

20. L. Zhao, J. X. Xu, N.Yin, **H. C. Wang**, C. J. Zhang, and J. F. Wang, Microstructure, dielectric and piezoelectric properties of Ce-modified $Na_{0.5}Bi_{4.5}Ti_4O_{15}$ high temperature piezoceramics, **Phys. Stat. Sol. RRL** 3 (2008) 111.

21. H. Peng, C. L. Wang, J. C. Li, R. Z. Zhang, **H. C. Wang**, Y. Sun, M. Sheng, Electronic and lattice vibrational properties of $BaSi_2$ from density function theory calculations, **J. Elec. Mater.** In Press. DOI:10.1007s11664-010-1483-y.

22. H. Peng, C. L. Wang, J. C. Li, R. Z. Zhang, **H. C. Wang**, Y. Sun, Theoretical investigation on the thermoelectric transport properties of $BaSi_2$, **Chin. Phys. B** 20 (2010) 046103

23. H. Peng, C. L. Wang, J. C. Li, R. Z. Zhang, M. X. Wang, **H. C.Wang,** Y. Sun, M. Sheng, Lattice dynamic properties of $BaSi_2$ and $BaGe_2$ from first principle calculations, **Phys. Lett. A** 374 (2010) 3797.

24. J. C. Li, C. L. Wang, H. Peng, M. X. Wang, R. Z. Zhang, **H. C. Wang**, J. Liu, M. L. Zhao, L. M. Mei, Vibrational and thermal properties of small diameter silicon nanowires, **J. Appl. Phys.** 108 (2010) 063702

25. L. Y. LV, C. L. Wang, J. L. Zhang, M. L. Zhao, M. K. Li, **H. C. Wang**, Modified $(K_{0.5}Na_{0.5})(Nb_{0.9}Ta_{0.1})O_3$ ceramics with high Q_m, **Mater. Lett.** 62 (2008) 3425.

◆ PATENT LIST

1. Invention Patent of China, Application Nos.201010147835.1, The method of synthesis for La and Dy dual doped $SrTiO_3$, by **H. C. Wang**, C. L. Wang, W. B. Su, J Liu, Y. Sun, L. M. Mei.

2. Invention Patent of China, Application Nos. 201110030154.1, The method of synthesis for oxide thermoelectric module with whole ceramics, by C. L. Wang, **H. C. Wang**, W. B. Su, J Liu, L. M. Mei.

3. Utility Model Patent of China, Application Nos. 201120028834.5, Oxide thermoelectric module with whole ceramics, by C. L. Wang, **H. C. Wang**, W. B. Su, J Liu, L. M. Mei.