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XIAORU GUO

FOCUS

My current work focuses on solar cell design and testing. I am specialized at 2D nanomaterial, especially graphene-based material preparations and their electrochemical applications. I am also professional at common material characterization methods.

EDUCATION BACKGROUND

2012/09 – Present **PH.D. OF ENGINEERING (SOLAR CELLS AND NANOMATERIALS)**
University of Wisconsin-Milwaukee, WI, USA
2007/08 – 2011/07 **B.S. OF THERMAL ENGINEERING**
Tsinghua University, Beijing, China

SKILLS

Professional operation of material characterization: SEM, AFM, BET, XRD, UV-Vis, RAMAN, etc.
Skilled operation of electrochemical tests and solar cell tests: CV, LSV, Tafel, IPCE, PVIV, etc.
Computer programming: LabVIEW, Ruby, Python, C, C++, etc.
Rich experience on mechanical designing and analysis: AutoCAD, Pro E, SolidWorks, Fluent, ANSYS, etc.

RESEARCH EXPERIENCE

2012/08 – Present **NANOMATERIAL PREPARATION & EMERGING SOLAR CELL FABRICATION**
Supervisor: Dr. Junhong Chen; UW-Milwaukee
▪ fabricating and testing dye-sensitized solar cells and perovskite solar cells ▪ preparing 2D nanomaterials for energy applications, including lithium-ion batteries, fuel cells and solar cells ▪ catalytic activity of 2D material hybrids for electrochemical studies ▪ 3D printing assisted biomaterial preparation for artificial red blood cells ▪ nanoscale manufacturing system design and maintenance

2010/11 – 2011/07 **MULTI-ENERGY COMPLEMENTARY DISTRIBUTED CCHP SYSTEMS**
Supervisor: Dr. Lin Shi; Tsinghua University, Beijing, China
▪ Studied lithium bromide aqueous solution thermal properties ▪ built a multi-energy complementary experimental bench ▪ verified theory by simulating calculations

2008/10 – 2010/10 **ENGINE AND TRANSMISSION REDESIGN, FORMULA STUDENT CHINA**
Supervisors: Dr. Xuewu Ji, Dr. Chengtao Lin and Dr. Yugong Luo, Tsinghua University, Beijing, China
Team member of FSAE-THU team. Responsible for redesigning and optimizing a 600cc engine for a FSAE-student level car. Designed car raced in 2010 Formula Student China

WORK HISTORY

2016/08 – Present **TEACHING ASSISTANT, UW-MILWAUKEE**
▪ Assisted teaching for engineering thermodynamics ▪ lecturing calculations and practical methods ▪ leading students for discussion and problem solving

2015/01 – 2016/06 **RESEARCH ASSISTANT, UW-MILWAUKEE**
▪ Semi-transparent perovskite solar cell design and test ▪ heavy metal ion collection from waste acid and recycling for solar cell use ▪ lab safety coordinator

2013/08 – 2014/12 **TEACHING ASSISTANT, UW-MILWAUKEE**
▪ Taught mechanical experiment design and theories of common mechanical transducers

2014/06 – 2014/08 **ADVANCED MANUFACTURING INTERN, JOHNSON CONTROLS**
▪ Lithium-ion battery recycling method research, including marketing analysis ▪ lead-acid battery and lithium-ion battery separation technology research

2012/08 – 2013/05 **RESEARCH ASSISTANT, UW-MILWAUKEE**
Dye-sensitized solar cell fabrication and electrochemical testing

HONORS

2015/08 – 2016/05 **CHANCELLOR'S GRADUATE STUDENT AWARD, UW-MILWAUKEE**
2014/08 – 2015/05 **UWM CEAS DEAN'S AWARD, UW-MILWAUKEE**
2012/08 – 2014/05 **CHANCELLOR'S GRADUATE STUDENT AWARD, UW-MILWAUKEE**
2010/08 – 2011/07 **SOCIAL WORK SCHOLARSHIP, TSINGHUA UNIVERSITY, BEIJING, CHINA**

PUBLICATIONS

CITATIONS: 368 H-INDEX: 7 I10-INDEX: 7

1. Liu, L., Huang, X., Guo, X., Mao, S., Chen J., Decorating in situ ultrasmall tin particles on crumpled N-doped graphene for lithium-ion batteries with a long life cycle, *Journal of Power Sources* **2016**, 328, 482-491. (**IF=6.333**)
2. Hou, Y., Yuan, H., Wen, Z., Cui, S., Guo, X., He, Z., Chen, J., Nitrogen-doped graphene/CoNi alloy encased within bamboo-like carbon nanotube hybrids as cathode catalysts in microbial fuel cells, *Journal of Power Sources* **2016**, 307, 561-568. (**IF=6.333**)
3. Guo, X., Lu, G., Chen, J., Graphene-based Materials for Photoanodes in Dye-sensitized Solar Cells, *Frontiers in Energy Research* **2015**, 3, 50.
4. Crouse, J.Z., Mahuta, K.M., Mikulski, B.A., Harvestine, J.N., Guo, X., Lee, J.C., Kaltchev, M.G., Midelfort, K.S., Tritt, C.S., Chen, J., Zhang, W., Development of a microscale red blood cell-shaped pectin-oligochitosan hydrogel system using an electrospray-vibration method: preparation and characterization, *Journal of Applied Biomaterials & Functional Materials* **2015,**13, 4. (**IF=1.500**)
5. Hou, Y., Cui, S., Wen, Z., Guo, X., Feng, X., Chen, J., Strongly Coupled 3D Hybrids of N‐doped Porous Carbon Nanosheet/CoNi Alloy‐Encapsulated Carbon Nanotubes for Enhanced Electrocatalysis. *Small* **2015** 11 (44), 5940-5948. (**IF=8.315**)
6. Hou, Y., Cui, S., Wen, Z., Guo, X., Feng, X., Chen, J., Electrocatalysis: Strongly Coupled 3D Hybrids of N‐doped Porous Carbon Nanosheet/CoNi Alloy‐Encapsulated Carbon Nanotubes for Enhanced Electrocatalysis (Small 44/2015) *Small* **2015** 11 (44), 5939-5939. (**IF=8.315**)
7. Yuan, H., Hou, Y., Wen, Z., Guo, X., Chen, J., He, Z., Porous Carbon Nanosheets Co-doped with Nitrogen and Sulfur for Oxygen Reduction Reaction in Microbial Fuel Cells. *ACS Appl. Mater. Interfaces* **2015**, 7(33), 18672-18678. (**IF=7.145**)
8. Cui, S., Guo, X., Ren, R., Zhou, G., & Chen, J., Decoration of vertical graphene with aerosol nanoparticles for gas sensing. *J. Phys. D: Appl. Phys.* **2015,** 48 (31), 314008. (**invited paper, IF=2.772**)
9. Ren, R., Wen, Z., Cui, S., Hou, Y., Guo, X., & Chen, J., Controllable Synthesis and Tunable Photocatalytic Properties of Ti3+-doped TiO2. *Scientific Reports*. **2015,** 5. (**IF=5.228**)
10. Kim, H., Huang, X., Wen, Z., Cui, S., Guo, X., & Chen, J., Novel hybrid Si film/carbon nanofiber for anode materials in lithium-ion batteries. *J. Mater. Chem. A* **2014,** 3(5), 1947-1952. (**IF=8.262**)
11. Mao, S., Wen, Z., Ci, S., Guo, X., Ostrikov, K. K., & Chen, J., Perpendicularly Oriented MoSe2/Graphene Nanosheets as Advanced Electrocatalysts for Hydrogen Evolution. *Small* **2014,** 11(4), 414-419. (**IF=8.315**)
12. Mao, S., Wen, Z., Ci, S., Guo, X., Ostrikov, K. K., & Chen, J., Hydrogen Evolution: Perpendicularly Oriented MoSe2/Graphene Nanosheets as Advanced Electrocatalysts for Hydrogen Evolution (Small 4/2015) *Small* **2014,** 11(4), 508-508. (**IF=8.315**)
13. Hou, Y., Zhang, B., Wen, Z., Cui, S., Guo, X., He, Z., Chen, J., A 3D Hybrid of Layered Mos2/Nitrogen-Doped Graphene Nanosheet Aerogels: An Effective Catalyst for Hydrogen Evolution in Microbial Electrolysis Cells. *J. Mater. Chem. A* **2014**, 2, 13795-13800. (**IF=8.262**)
14. Kim, H., Huang, X., Guo, X., Wen, Z., Cui, S., & Chen, J., Novel Hybrid Carbon Nanofiber/Highly Branched Graphene Nanosheet for Anode Materials in Lithium-Ion Batteries. *ACS Appl. Mater. Interfaces* **2014**, 6(21), 18590-18596. (**IF=7.145**)
15. Harvestine, J. N., Mikulski, B. A., Mahuta, K. M., Crouse, J. Z., Guo, X., Lee, J. C., Midelfort, K. S., Chen, J., Zhang, W., A Novel Red-Blood-Cell-Shaped Pectin-Oligochitosan Hydrogel System. *Particle & Particle Systems Characterization* **2014,** 31(9), 955-959. (**IF=4.37**)
16. Harvestine, J. N., Mikulski, B. A., Mahuta, K. M., Crouse, J. Z., Guo, X., Lee, J. C., Midelfort, K. S., Chen, J., Zhang, W., Hydrogels: A Novel Red‐Blood‐Cell‐Shaped Pectin‐Oligochitosan Hydrogel System (Part. Part. Syst. Charact. 9/2014). *Particle & Particle Systems Characterization* **2014,** 31(9), 912-912. (**IF=4.37**)
17. Hou, Y., Wen, Z., Cui, S., Guo, X., Chen, J., Constructing 2D Porous Graphitic C3N4 Nanosheets/Nitrogen-Doped Graphene/Layered MoS2 Ternary Nanojunction with Enhanced Photoelectrochemical Activity. *Advanced materials* **2013**, 25 (43), 6291-7. (**IF=18.960**)