Huilei Zhao

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EDUCATION

TEXAS A&M UNIVERSITY, College Station, Texas (**GPA** 3.44/4.00) **May 2017**

UNIVERSITY OF WISCONSIN-MILWAUKEE, Wisconsin (Transfer) (**GPA** 3.70/4.00) Sep. 2011- May 2014

- PhD of **Mechanical Engineering** **Direction**: Photocatalysis, nanomaterials, thermal dynamics

SHANDONG UNIVERSITY, Jinan, Shandong, P.R. China June 2011

- B.S. of **Chemistry** - B.A. of **Finance** (**Outstanding Graduates Award in Shandong Province**)

SKILLS

MATERIAL CHARACTERIZATION: GC, XRD, BET, SEM-EDS, UV-Vis, RAMAN, TEM, HPLC, TOC, Spectrofluorometer

MATERIAL SYNTHESIS: Hydrothermal, Sol-gel, solid-state, ALD, Photodeposition, Wet impregnation

LANGUAGE: English, Chinese **SOFTWARE**: Mathematica, Origin, MS Office

PROGRAMMING: Python

EXPERIENCE

Management

TEXAS A&M UNIVERSITY, College Station, Texas Sep. 2014-Present

Laboratory Manager

- Designed and initiated new lab for low carbon energy & sustainable environment
- Managed usage and time arrangement, and established standard operation procedure of all equipments
- Oversaw the laboratory safety and kept the whole laboratory clean and in an orderly manner
- Ensured the regents and supplies were available when needed

Teaching

TEXAS A&M UNIVERSITY, College Station, Texas Jan.-May 2015

Graduate Assistant (MEEN 315 Principle of Thermodynamics)

- Offered guest lectures for 86 undergraduate students
- Assisted teachers with recordkeeping, such as tracking attendance and calculating grades
- **Graduate Teaching Certificate (NSF CIRTL)** Apr. 2015

UNIVERSITY OF WISCONSIN-MILWAUKEE, Wisconsin Jan.-May 2013

Teaching Assistant (ME 312 Basic Heat Transfer)

- Led sample-problem discussions and performed lab instructions for 2 sections

Volunteer

BIG EVENT, Texas A&M University, College Station, Texas 2016

- Participated in the community service

CHASING THE SUNLIGHT Volunteer activity in underdeveloped area, Rizhao, China Aug. 2009

Organizer & Team Leader & Teacher (team of 22 students from 5 varied majors and 4 different universities)

- Initiated and organized the volunteer activity: volunteer teaching, science advocacy
- Designed the unique Team T-Shirt, brochure for scientific knowledge, and sketching course syllabus
- Oversaw the team progress and budget, and ensured the safety of all team members
- **Excellent Social Practice Award** & - **Scholarship for Excellent Social Works** 2009

Research since 2011

Topic 1: Novel TiO_2-based nanomaterials for CO_2 photoreduction to fuels using sunlight

Topic 2: Design of high-performance material for photo and thermal catalytic CO_2 reforming of CH_4

Topic 3: Investigate the effect of defect on the photocatalytic performance of TiO_2 for CO_2 photoreduction

- Proficiently operated Gas Chromatograph (GC) for mixed gas component (etc. CO_2, CO, CH_4, H_2...) analysis
- Installed and possessed problem solving ability for both compact-column and capillary-column GC
- Installed and operated atomic layer deposition (ALD) to engineer novel nanomaterials
- Mentored undergraduates for NSF REU project, and high school chemistry teachers for NSF RET project
- Collaborated with Urban Ecology Center including lab tour and series lectures

HONORS

- **The 1st Place Prize** Poster competition at Texas A&M Energy Institute Workshop Jun-15
- **Travel Award** Texas A&M Univeristy TEES Mar. 2015
- **The 2nd Place Prize** (Graduate) at UWM CEAS Annual Poster Competition Apr. 2012
- **Chancellor Graduate Student Award** in ME department University of Wisconsin Milwaukee 2011-2014

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PUBLICATIONS

1 **Zhao, H.L.**, Xu, J., Liu, L.J, Rao, G.Y., Zhao, C.Y., Li, Y.* CO2 photoreduction with water vapor by Ti-embedded MgAl layered double hydroixdes, *Journal of CO2 Utilization* . **2016**, , 15, 15-23

2 **Zhao, H.L.**, Liu, L.J., Andino, J.M., Li, Y.* Bicrystalline TiO2 with Controllable Anatase/Brookite Phase Content for Enhanced CO2 Photoreduction to Fuels. Journal of Materials Chemistry A. **2013**, 1, 8209-8216

3 Rao, G.Y., Zhang, Q.Y., **Zhao, H. L.**, Chen, J.T., Li, Y.* Novel Titanium Dioxide/Iron(III) Oxide/Graphene Oxide Photocatalytic Membrane for Enhanced Humic Acid Removal from Water, *Chemical Engineering Journal* . **2016**, 302, 633-640

4 Liu, L.J., Jiang, Y.Q., **Zhao, H.L.**, Chen, J.T., Cheng, J.L., Yang, K.S.*, Li, Y.* Engineering Coexposed {001} and {101} Facets in Oxygen-Deficient TiO2 Nanocrystals for Enhanced CO2 Photoreduction under Visible Light, *ACS Catalysis* . **2016**. 6, 1097-1108

5 Zhao, C.Y., Liu, L.J., Rao, G.Y., **Zhao, H.L.**, Wang, L. H., Xu, J.Y., Li, Y.* Synthesis of novel MgAl layered double oxides grafted TiO2 cuboids and their photocatalytic activity on CO2 reduction with water vapor, *Catalysis Science & Technology* . **2015**, 5, 3288-3295

6 Zhao, C.Y., Liu, L.J., Zhang, Q.Y., Rogers, J.E., **Zhao, H.L.**,Li, Y.*Synthesis of Carbon-TiO2 Nanocomposites with Enhanced Reversible Capacity and Cyclic Performance as Anodes for Lithium-Ion Batteries, *Electrochimica Acta.* **2015**, 155, 288-296.

7 Liu, L.J., Zhao, C.Y., **Zhao, H.L.**, Zhang, Q.Y.,Li, Y.*ZnO-CoO Nanoparticles Encapsulated in 3D Porous Carbon Microspheres for High-performance Lithium-Ion Battery Anodes ,*Electrochimica Acta.* **2014**, 135, 224-231.

8 Liu, L.J., Zhao, C.Y., Pitts, D.T., **Zhao, H.L.**, Li, Y.* CO_2 Photoreduction with H_2O Vapor by Porous MgO/TiO_2 Microspheres: Effects of Surface MgO Dispersion and CO_2 Adsorption/Desorption Dynamics. *Catalysis Science &Technology* . **2014**, 4, 1539-1546

9 Zhao, C.Y., Liu, L.J., **Zhao, H.L.**, Krall, A., Wen, Z., Chen, J.H., Hurley, P., Jiang, J., Li, Y.* Sulfur-Infiltrated Porous Carbon Microspheres with Controllable Multi-Modal Pore Size Distribution for High Energy Lithium-Sulfur Batteries. *Nanoscale* . **2014**,6, 882-888

10 Liu, L.J., Gao, F., **Zhao, H.L.**, Li, Y.* Tailoring Cu Valence and Oxygen Vacancy in Cu/TiO_2 Catalysts for Enhanced CO_2 Photoreduction Efficiency. *Applied Catalysis B: Environmental* . **2013**, 134-135, 349-358

11 Liu, L.J., Pitts, D.T., **Zhao, H.L.**, Zhao, C.Y., Li, Y.* Silver-incorporated bicrystalline (anatase/brookite) TiO_2 microspheres for CO_2 photoreduction with water in the presence of methanol. *Applied Catalysis A: General* . **2013**, 467, 474-482

12 Liu, L.J., Zhao, C.Y., **Zhao, H.L.**, Pitts, D., Li, Y.* Porous Microspheres of MgO-Patched TiO_2 for CO_2 Photoreduction with H_2O Vapor: Temperature-Dependent Activity and Stability. *Chemical Communications* . **2013**, 49, 3664-3666

13 Zhao, C.Y., Krall, A.J., **Zhao, H.L.**, Zhang, Q.Y., Li, Y.* Ultrasonic spray pyrolysis synthesis of Ag/TiO_2 nanocomposite photocatalysts for simultaneous H_2 production and CO_2 reduction. *International Journal of Hydrogen Energy* , **2012**, 37(13), 9967-9976

14 Liu, L.J., **Zhao, H.L.**, Andino, J. M., Li, Y.* Photocatalytic CO_2 reduction with H_2O on TiO_2 nanocrystals: Comparison with anatase, rutile, brookite polymorphs and exploration of surface chemistry. *ACS Catalysis* . **2012**, 2, 1817-1828