

# Wei Liu

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500, 10<sup>th</sup> St. NW, Atlanta, GA 30318 US

## EDUCATION

- **Ph.D. Student in Chemical Engineering, Hunan University, China, Sep. 2009-Jun. 2015**

Research Area: Synthesis of nano-structured materials and their applications in catalytically green chemistry and clean fuels utilization.

- **B.Sc. in Hunan University of Science and Engineering, China, Jul. 2005-Sep. 2009**

Thesis: Studies on the green oxidation of benzyl alcohol by peroxo-Mo complex

## ACADEMIC EXPERIENCE

### **Georgia Institute of Technology**

**Visiting Scholar in Chemical & Biomolecular Engineering, Advisor: Dr. Yulin Deng; Aug. 2012-Aug. 2015**

- Fabrication of solar or heating-induced direct biomass fuel cell using polyoxometalates as charge carrier. The breakthrough fuel cell directly converts raw biomass into electricity without noble metal catalysts. This result has been featured by more than **50 magazines, website news media, radio stations and newspapers in almost all major languages.**
- Fabrication of high-performance liquid-catalyst fuel cell for direct biomass-into-electricity conversion. The improved fuel cell is 3000 times higher in power density than traditional microbial fuel cell.
- Preparation of ZrO<sub>2</sub>-organic nano-hybrids applied for high-refractive-index materials.

### **Hunan University**

**Graduate Research Assistant, Advisor: Dr. Zisheng Chao; Sep. 2009-Aug. 2012**

- Preparation of novel supramolecular hybrids with fast responsive visible-light photochromism.
- National project: Catalytic dehydration of low concentration bio-ethanol to ethylene
- Synthesis of novel inorganic material for extracting Cs & Rb from mother liquor of salt manufacture.
- Synthesis of methyl N-phenyl carbamate based on nano-ZnO catalysts.

### **National Center for Nanoscience and Technology (NCNST)**

**Visiting Graduate Student, Advisor: Dr. Jian-ru Gong, Beijing, Jul. 2009-Sep. 2009**

- Preparation of graphene sheets using Chemical Vapor Deposition and Chemical Etching method.

## TECHNICAL SKILLS

- **Catalytic Chemistry:** Experienced in preparation of inorganic based catalysts (metal oxides and zeolites etc.), industrial catalysis process (fixed bed reactor, fluidized bed reactor etc.) and familiar with catalytic theory.
- **Energy storage/harvesting:** Experienced in fabricating solar cells, supercapacitors, sensors, ionic diodes with advanced knowledge on fabrication processes of batteries, fuel cells, supercapacitor, etc.
- **Nano-materials:** Experienced in preparing novel nano-zeolites (ZSM, TS, faujasites etc.), functionalized meso-porous materials (SBA-15, MCM-41, etc.) and metal oxides (ZnO, ZrO<sub>2</sub>, MnO<sub>2</sub> etc.) by using hydrothermal, chemical deposition and solid-state synthesis methods.
- **Materials Characterizations:** SEM, EDS, IR, UV-Vis, AAS, FT-IR, TGA, BET, XRD, NMR, GPC, GC-MS,

HPLC, Optical microscope, Particle size, Zeta-potential, etc.

- **Computer Skills:** Chem office, Origin, CAD, Matlab, Flash, Fireworks, dreamweaver and computer programming languages (C, C++, **Flash active script and ASP etc.**).

### AWARDS

- Chinese Government scholarship, Aug. 2012
- The second award in “Challenge Cup” Scientific Papers Competition, Jan. 2008
- Third Place in Chemistry Experiment Design Competition of Hunan Province, Sep. 2007
- Champion in Chemistry Experiment Design Competition of Hunan University of Science and Engineering, Jun. 2007
- Third Place in Flash Movie Design Competition of Hunan University of Science and Engineering, Dec. 2006

### SELECTED PRESENTATIONS AND POSTERS

- **Wei Liu**, Y. Deng, High efficient biomass-to-hydrogen conversion by polyoxometalate solution catalyzed electrolysis, International Chemical Congress of the Pacific Basin Societies (PacifiChem) 2015, Honolulu, Hawaii, December 20-25, 2015
- **Wei Liu**, Y. Cui, D. Xu, Z. Zhang, Low temperature biomass-to-electricity direct fuel cell, International Chemical Congress of the Pacific Basin Societies (PacifiChem) 2015, Honolulu, Hawaii, December 20-25, 2015
- **Wei Liu**, Xu Du, Yulin Deng, Solar-induced direct biomass-to-electricity hybrid cell using polyoxometalate as photo-catalyst and charge carrier. Renewable Bioproducts Institute Poster Session, Oct. 2014.
- **Wei Liu**, Xu Du, Yulin Deng, Direct conversion of biomass-to-electricity and chemicals using groundbreaking fuel cell technology. SABIC (Saudi Basic Industries Corporation) Poster Session, Nov. 2014.

### SELECTED PUBLICATIONS

- **Wei Liu**, et al., High efficiency hydrogen evolution from native biomass electrolysis. *Energy & Environmental Science*, 2016.
- **Wei Liu**, W. Mu, M. Liu, X. Zhang, H. Cai, Y. Deng, Solar-induced direct biomass-to-electricity hybrid cell using polyoxometalate as photo-catalyst and charge carrier, *Nature Communications* 5, 3208, 2014
- **Wei Liu**, W. Mu, and Y. Deng, High-Performance Liquid-Catalyst Fuel Cell for Direct Biomass-into-Electricity Conversion, *Angew. Chem.*, 2014, 126, 1 (**Very Important Paper, VIP**).
- Chen, B.-H., **Wei Liu**, et al., A simple and convenient approach for preparing core-shell-like silica@nickel species nanoparticles: highly efficient and stable catalyst for the dehydrogenation of 1,2-cyclohexanediol to catechol. *Dalton Transactions*, 2015.