

# Zi-Qi Jia

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## Education

**Central South University** 09/2013-07/2017

**University of Florida** 08/2017-12/2019

**Specialty:** Materials Chemistry    **Degree:** Bachelor of Science, Master of Science (expected in August 2019)

**Undergraduate GPA (2015-2016):** 3.3/4.0    **Graduate GPA:** 3.7/4

**Relevant Courses in Electrical Engineering:** *VLSI design, Micro-electro-mechanical-system (MEMS), Micronano Machined Metamaterials, semiconductor fabrication laboratory, carbon nanotube, Nano VLSI technology*

## Standard Test

**TOEFL:** 102 = R: 28 + L: 28 + S: 23 + W: 23 03/13/2016

**GRE:** 320 = V (154) + Q (166) + W (3.5) 10/30/2016

## Paper

**C-S bonds induced ultrafine SnS<sub>2</sub> dots/ porous g-C<sub>3</sub>N<sub>4</sub> sheets 0D/2D heterojunction: synthesis and photocatalytic mechanism investigation**

*Dalton Transactions*

Authors: Anquan Zhu, Lulu Qiao, **Ziqi Jia**, Pengfei Tan, YiLiu, Yong jinMa and Jun Pan

## Research

**Application Research of Boron Doped Diamond (BDD) Membrane Electrode Electrochemistry in Degrading Landfill Wastewater**

06/2015-03/2016

**Tutor:** Professor Qiu-Ping Wei    **Position:** Member    **Members:** 5

**Background:** BDD (Boron Doped Diamond) membrane electrode research is of great value in industrial waste water treatment, possessing huge application prospect and environmental meaning.

**Purpose:** To adopt Hot Filament Chemical Vapor Deposition (HFCVD) method to manufacture high-quality BDD membrane on the surface of Nb metal, and to combine the strengths of Nb and BDD in order to obtain durable high-performance BDD membrane electrode

### Responsibility:

- ✧ Prepared niobium substrates for depositing
- ✧ Operated the vapor deposition furnace to manufacture the diamond layer
- ✧ Designed a simple wastewater disposal plant to conduct the experiment

**Innovation:** The method improved the efficiency of wastewater disposal.

**Achievement:** Honorable undergraduate exploration project

**Skill:** operating the CVD furnace and electrochemical workstation; Origin Lab; Jade

**Three-Dimensional Li<sub>3</sub>V<sub>2</sub>(PO<sub>4</sub>)<sub>3</sub>/C as a High-Capacity Cathode Material with Its Omitted Plateaus for Lithium-ion Batteries**

04/2016-12/2016

**Mentor:** Associate Professor Jia-Feng Zhang    **Position:** Member    **Members:** 8

**Background:** Monoclinic Li<sub>3</sub>V<sub>2</sub>(PO<sub>4</sub>)<sub>3</sub> with PO<sub>4</sub> tetrahedra and VO<sub>6</sub> octahedra NASICON structure provides more efficient three-dimensional path ways for Li<sup>+</sup> extraction and a better performance of capacity in the range of 1.5-4.65V than other cathode materials. However, the cycling behavior is not optimized for some inherent limitations.

**Purpose:** In order to exploit the latent capacity of Li<sub>3</sub>V<sub>2</sub>(PO<sub>4</sub>)<sub>3</sub>, the three-Dimensional monoclinic spherical Li<sub>3</sub>V<sub>2</sub>(PO<sub>4</sub>)<sub>3</sub>/C for cathode material was synthesized and tested

### Responsibility:

- ✧ Synthesized the complex with specific compounds like Lithium dihydrogen phosphate and vanadate ammonia
- ✧ Sintered the materials in different temperature and atmosphere conditions
- ✧ Assembled the button cells with the synthesized cathode material to test its capacity
- ✧ Operated the X-Ray diffractometer and analyzed the result with software Jade to collect the information of the materials
- ✧ Carried out the cyclic voltammetry tests (CV) and electrochemical impedance spectroscopy (EIS) with an electrochemical analyzer.

**Innovation:** Obtained the omitted plateaus of Li<sub>3</sub>V<sub>2</sub>(PO<sub>4</sub>)<sub>3</sub>/C as the material for cathode of LIBs, revealed its capacity, stability at the rate of

## RESUME

0.1C and 3C

**Achievement:** A paper in review

**Skill:** operating the spray-dryer, lyophilizer, Pipe furnace and dry Ar-filled glove box; OriginLab; Jade

### Antibacterial Properties of Charged TiN Surface for Dental Implants & Semiconductor processing

05/2018 – 08/2018

**Supervisor:** Dr. Ren Fan

**Background:** the denture related disease is also a severe issue puzzling patient and doctors. Most of these issues are related to the bacteria that form biofilm on denture surface and thus a method to inhibit the growth of bacteria on denture surface is required. Even use of different metals in an implant has significant effect on bacterial growth. Meanwhile, Quaternary ammonium compounds(QACs) is a class of cationic organic compounds disinfectants established that been proved to be effective. We active the TiN surface with QACs by Menschutkin reaction to test the antibiotic property with in vitro oral bacteria.

#### Responsibility:

- ✧ Prepare Ti discs with PECVD and activate TiN discs with Menschutkin reaction
- ✧ photolithography process and the Mask design
- ✧ fabricating the vertical wall with RIE etching machine
- ✧ testing antibiotic property with N<sup>+</sup> coated discs

#### Innovation:

**Skill:** operating the PECVD, EBEAM deposition, Mask design with L-Edit

#### Internship

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##### China Minmetals Zigong Cemented Carbide Co .LTD

07/2016-08/2016

- ✧ Learnt the features of various materials and the production process in the workshop
- ✧ Led other interns to participate in the firing work and metalworking

##### Central South University Electrical and Electronical Practice Center

04/2015-06/2015

- ✧ Made transistor radio, welded circuit board, mastered electrotechnology knowledge and radio's working principle

##### Central South University Metalworking Practice Center

09/2014-01/2015

- ✧ Used mechanical equipment to make hammer including numerically controlled machine tool, bench work and
- ✧ Used 3D printing machine to manufacture the model chosen
- ✧ Got the highest score among the class by toy car I made with rotatable axis

#### Award

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- ✧ Honorable Mention in the Mathematical Contest in Modeling 2016
- ✧ Outstanding Student Cadre 2015-2016
- ✧ Academic Year Scholarship awarded by the Powder Metallurgy Research Institution 2016

#### Activity

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##### The Mathematical Contest in Modeling

01/2016

- ✧ Built some of the mathematical models to cope with the problem *A Hot Tube*
- ✧ Took in charge the entire paper writing

##### Typical Graduates Career Plan Research

04/2014-04/2015

- ✧ Interviewed those who graduated ten years ago from our department and reported related career development and planning instructions

##### Library Volunteer Activity

09/2014-01/2016

- ✧ Did some cleaning work and managed books and order each week in the school library

#### Others

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- ✧ Good at software like LaTeX and TRADOS software Jade, Visio, Processon
- ✧ Capable of Origin Lab, SDL Trados, Microsoft, Visual studio C<sup>++</sup>
- ✧ Specialized in interpreting and translating between Chinese and English