Xinyu **Zhang**

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Education Background

Dalian University of Technology

Sept. 2017 – Jun. 2020

MASTER OF CHEMICAL ENGINEERING (ELECTROCHEMICAL ENGINEERING) GPA: 3.64/5.00 (86.4/100)

Academic courses: Theoretical Electrochemistry; Electrochemical Power Source; Photoelectrocatalytic Materials; Corrosion and Corrosion Control.

Research Areas: Surface & interface; Metal corrosion; Semiconductor; Electrodeposition & electroless deposition.

Dalian University of Technology

Sept. 2013 – Jun. 2017

BACHELOR OF ELECTROCHEMICAL ENGINEERING GPA: 3.60/5.00 (86.0/100) Ranking: 4/30

Academic Courses: Electrochemistry; Chemical Power Techniques; Physical Examination in Material Technology; Metallic Corrosion.

Research Areas: Electrochemistry; Anti-corrosion coating; Semiconductor; Electrochemical water treatment.

Work Experience

SAIC VOLKSWAGEN Automotive Co., Ltd. (Shanghai)

Aug. 2020 – Nov. 2021

AUTOMOTIVE ENGINEER - Focusing on the anti-corrosion design of body-in-white and battery pack shell.

Research Experience

Electrochemical Engineering Laboratory, Dalian University of Technology

Sept. 2017 – Jun. 2020

STUDENT RESEARCHER AT ELECTROCHEMICAL ENGINEERING LAB, ADVISED BY PROF. LIDA WANG

Topic: **Research on the corrosion promotion mechanism of semiconductor material/metal galvanic system**

Topic 1: Study on the corrosion promotion mechanism of TiO_2 semiconductor fillers on copper

- Investigated the influence of the crystal type and morphology of TiO_2 semiconductor fillers on the corrosion behavior of copper by LEIS and EIS.
- Proposed a mechanism of TiO_2 promoting copper corrosion in dark conditions, based on the Ohmic contact, electrical conductivity and oxygen reduction activity of TiO_2 by SKP, RRDE, and M-S test.
- Provided the basis of selecting semiconductor as anticorrosive fillers and the crystal structure design of semiconductor fillers.

Topic 2: Research on the corrosion promotion mechanism of corrosion product semiconductors on iron

- Investigated the influence of five iron corrosion product semiconductors on iron corrosion behavior by SVET.
- Elaborated on the "corrosion promoting activity" of the corrosion product semiconductors on iron, based on the whole corrosion process and the nature of the corrosion products.
- Analyzed the influence of semiconductor crystal phase transition on the "corrosion promoting activity" of the semiconductor.
- Proposed preliminarily a basis for judging whether semiconductors have "corrosion promoting activity" on metals.

Electrochemical Engineering Laboratory, Dalian University of Technology

Feb. 2017 – Jun. 2017

STUDENT RESEARCHER AT ELECTROCHEMICAL ENGINEERING LAB, ADVISED BY PROF. GUICHANG LIU & PROF. WEN SUN

Topic: **Study on influence of different semiconductor materials in composite coatings on metal corrosion behavior**

- Investigated the influence of three types of semiconductor fillers (TiO_2, Fe_2O_3 and Cu_2O) on metal corrosion under damaged coatings by LEIS, EIS, EN, and SEM.
- Explained preliminarily the reason for the "corrosion promotion activity" of semiconductor filler, based on the work function and oxygen reduction activity.

Publications

1. **X. Zhang**, S. Li, W. Sun, L. Wang, J. Wang, G. Liu, "Study on the corrosion behavior of copper coupled with TiO_2 with different crystal structures", Corrosion Science, 2021, 183: 109352. (Journal Impact Factor/JCR Quartile: **7.72/Q1**)
2. **X. Zhang**, L. Wang, W. Sun, Y. He, X. Shu, G. Liu, "Effect of Corrosion Products of Pure Iron on the Corrosion Behavior of Pure Iron and Its Mechanism", Materials Protection (Chinese Letters), 2021, 54(7): 30-36.
3. Li S, Sun W, Yang Z, **X. Zhang**, L. Wang, G. Liu, "Influences of semiconductor oxide fillers on the corrosion behavior of metals under coatings", Electrochimica Acta, 2018, 292: 425-434. (Journal Impact Factor/JCR Quartile: **7.336/Q1**)

Highlighted Projects

1. Preparation and performance study of conductive anticorrosive coating on stainless steel bipolar plates

Aug. 2018 – May. 2019

- Prepared the stainless steel electrode with Ni/Ni-Mo-P/Cr-C multilayer coating by electrodeposition and electroless deposition.
- The corrosion current density and the interface contact resistance of treated electrode in the acidic simulated fuel cell environment at 70°C are 0.85μA/cm² and 4.5mΩ·cm², which meets the performance requirements for bipolar plates (I<1μA/cm², ICR<10 mΩ·cm²).

2. Corrosion failure analysis of circulating water system of oil refining equipment and development of electrochemical water quality modification device *Oct. 2016 – Jan. 2017*

- Analyzing the circulating water quality, equipment material, and corrosion inhibitor performance, the oxygen concentration corrosion induced by cohesive sediment leads to equipment corrosion failure.
- Developed an electrochemical device for dissolved oxygen removal from water to improve circulating water quality and slow down the corrosion of the equipment.

Research Skill

- Extensive experience in material preparation method: hydrothermal synthesis, ultrasonic synthesis, electrodeposition, electroless deposition, coating.
- Experienced with surface treatment methods: electroplating, electroless plating, anodizing, electrochemical polishing, electrochemical etching.
- Good at material characterization methods: SEM, EDS, TEM, AFM, XRD, Raman, FTIR, UV-vis DR, XPS, UPS.
- Proficient in diverse electrochemical measurements: EIS, RRDE, cyclic and linear sweep voltammetry, potentiodynamic polarization, Mott-Schottky test, micro-area scanning electrochemical technology (SVET, LEIS, SKP, SECM), wire beam electrode, electrochemical noise.
- **IELTS** Overall Band Score: **6.5**.

RESEARCH INTERESTS

Energy storage material; Electrochemistry; Surface & interface; Metal Corrosion; Semiconductor material

Honors & Awards

Sept. 2019 Learning Excellence Scholarship (first-class)

Sept. 2018 Learning Excellence Scholarship (first-class)

Sept. 2017 Learning Excellence Scholarship (first-class)

Dec. 2016 National Encouragement Scholarship

Oct. 2016 Learning Excellence Award (Second Prize)

Dec. 2014 National Encouragement Scholarship

Oct. 2014 Learning Excellence Award (Second Prize)