Shenghao Zhang

Institute for Advanced Study, Shenzhen University, China
Email：zhan4712@purdue.edu Tel: (+86)13692236869

EDUCATION

Institute of Advanced Study, Shenzhen University 09/2019 – Present
B.S. in chemistry, GPA 3.55/4.5 83/100, **Advisor:** Q.Jason Niu

Purdue University, West Lafayette, Birck Nanotechnology Center 07/2022 –11/2022
Undergraduate Summer Research, **Advisor:** David M.Warsinger
Project: Inverse opal for photocatalysis

PUBLICATIONS

- 01/2022 Ji C, Lin C-W, **Zhang S**, Guo Y, Yang Z, Hu W, Xue S, Q.Jason Niu and **Richard B.Kaner**. Ultrapermeable nanofiltration membranes with tunable selectivity fabricated with polyaniline nanofibers. Journal of Materials Chemistry A. 2022;10(8):4392-401.
- 06/2021 Yang Z, Li L, Jiang C, Zhao N, **Zhang S**, Guo Y, Chen Y, Xue S, Ji C, Zhao S, Ralph Rolly Gonzales, **Hitedo Matsuyama**, Xia J and Q. Jason Niu**.** Tailored thin film nanocomposite membrane incorporated with Noria for simultaneously overcoming the permeability-selectivity trade-off and the membrane fouling in nanofiltration process. **Journal of Membrane Science**. 2021;640.(1)
- 06/2021 **Zhang S**, Xu M, Nie Z. Environment-Equity-Economy Model for Food. The UMAP Journal 42.3 (2021)

RESEARCH EXPERIENCES

Writing a review: Applications of Polyaniline on Ultrafiltration and Nanofiltration Membrane Apr 2022 -Present

- Wrote an introduction about water filtration membrane, several specific properties of polyaniline and the dilemma of membrane filtration technology
- Totally read 130 related research papers and literature reviewed the application of polyaniline in the surface grafted membrane, polyblend membrane and multilayered membrane in recent ten years
- Made a conclusion and outlook

Dynamic electrochemical analysis of the PANI interlayer Nov 2021 – Jan 2022

- Designed a sandwiched structure that a PANI modified MF membrane sandwiched between two polyacrylic acid plates, with a novel 'T' type copper tape inside sandwiched structure to avoid the influence of contact resistance between copper and PANI
- Used electrochemistry analyzer to detect the dynamic conductivity of polyaniline, optimized the system, debugged circuit
- Varied the concentration of PIP solution from 0.03w/v% to 0.1w/v% to identify a suitable concentration 0.05w/v% of PIP solution to react with TMC and got a readily comprehensible figure
- Analyzed the mechanism of doped/dedoped property of polyaniline layer in a novel sight of dynamic electrochemistry for the first time

Investigated reaction conditions to optimize PANI@GO hetero nanostructure Mar 2021 -Jun 2021

- Synthesized PANI by using graphene oxide with variables of concentration of aniline, shaken time and the volume of graphene oxide solution
- Used tailored dialysis bag with a molecular cut off equaling 10,000 to do product purification for another 24 hours
- Centrifuged the purified solution to deposit the PANI@GO hetero nanostructure so that separated the liquid supernatant
- Used freeze-drying method to completely separate residual H_2O in the PANI@GO nanostructure
- Used UV spectroscope for solution chemical composition analysis and used Infrared Spectroscope for both solution and solid chemical composition analysis

Preparation and characterization of tailored thin film nanocomposite membrane incorporated with Noria

Dec 2020 -Jan 2021

- Used interfacial polymerization method to fabricate all the thin film nanocomposite membrane
- The Characterization of infra-red spectrum, water contact angle, water permeability and salt rejection

PRESENTATIONS

Mesoporous Silica Thin Membranes of Dongyuan Zhao's group Dec 2021

Abstract: I introduced mesoporous silica material and the mechanism of bi-phase stratification growth strategy and PMMA assistant transfer method and some membrane characterizations.

Aquaporin-based bio-membrane Dec 2021

Abstract: I introduced the structure of cytomembrane including phospholipid, bilayer, aquaporin. Then i presented 3 kinds of bio-membrane and 12 kinds of preparation methods.

Seawater pre-desalination with electrodialysis Dec 2021

Abstract: I made an introduction of the definition of dialysis and electrodialysis and the basic mechanism of electrodialysis stack.

PROFESSIONAL SKILLS

Language: Familiar with C Language, Python

Software: Good command of basic using skills of Matlab, Microsoft Office

Excellent ability in English literature search and arrangement, strong self-learning capacity

Basic fundamental operating skills for chemical experiments (e.g. proficient in several kinds of membrane characterization technology, fabrication of nanofiltration/ultrafiltration membrane and preparation of polyaniline nanofiber)

LEARDERSHIP AND ACTIVITIES

Innovation & Practice Program for the Cultivation of High-level Internationalized Talents

- Completed four global governance courses: Communication and Public Diplomacy in Global Context, Gender Relationship and Gender Equality Education, Leadership and Team Management, Research Methods and Data Processing Methods in Report and Paper Writing, and passed the final exam.
- Participated in every salon and positively demonstrate my opinion on related topic.

HONORS

- Outstanding conclusion and won the third prize in 'Innovation and Entrepreneurship Development Fund for College Students' Project (Shenzhen University) Dec 2021
- Outstanding Innovative Talents **Scholarship** of Shenzhen University Sep 2021
- The Star of Double Innovations (Group) (First Prize) in Shenzhen University **(Scholarship)** Sep 2021
- **High-level internationalized Talents of China** Sep 2021
- The Second prize in Mathematical Contest in Modeling of "Shenzhen University Cup", Shenzhen University Jun 2021
- Certificate for Red Cross First Aider May 2021
- **Outstanding Winner** and **American Mathematical Society Award** (AMS Award) in **Interdisciplinary Contest in Modeling Contest** (Award rate :0.017%, almost 30000 teams are included), paper is published in **UMAP Journal** as a **model essay**. Apr 2021
- Outstanding innovative Talents **Scholarship** of Shenzhen University Dec 2020
- Best Team Award in English debate contest for college students May 2020
- Outstanding innovative Talents **Scholarship** of Shenzhen University Sep 2019