

Curriculum Vitae

Hannah Juan Han

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Research Interests

- Geochemistry of rare earth elements
- Experiments and thermodynamic modeling of rare earth elements at hydrothermal conditions

Academic Education

- **Ph.D., Analytical Chemistry**, University of North Dakota, USA. 2021.
- **M.S., Analytical Chemistry**, Northwest University, China. 2015.
- **B.S., Chemical Engineering and Technology**, Hainan University, China. 2011.

Appointments

- PostDoctoral Fellow, Bureau of Geology & Mineral Resources, New Mexico Institute of Mining & Technology, 08/2021-present.

Research Experiences

- Research Assistant, University of North Dakota, 08/2016-08/2021

Development of metal-containing nanoparticles for chemical analysis and bioanalysis.
- Research Assistant, Northwest University, 09/2012-06/2015

Tuning the conductivity type of cuprous oxide thin films via controlling the deposition potential and concentration of surfactant.
- Research Assistant, Hainan University, 09/2008-06/2011

Preparation and application of activated coconut charcoal incorporated with urease,

Teaching Experiences

University of North Dakota (2017-2021)

- Teaching Assistant, *Analytical Chemistry*, Fall semesters.
- Teaching Assistant, *General Chemistry II*, Spring 2020 and Summer 2020
- Teaching Assistant, *Introductory Chemistry*, Spring 2020.
- Teaching Assistant, *Introduction to Organic and Biochemistry*, Spring 2021
- Invited Lecturer, *Analytical Chemistry (Fall 2017 and Fall 2018)*, Development of inductively coupled plasma mass spectrometry, including its application for single nanoparticle and mercury detection.
- Invited Lecturer, *Analytical Spectroscopy (Spring 2020)*, Plasma atomic spectrometry sources and the use of inductively coupled plasma.

Patents Authorized

- Ying Yang, **Juan Han**, *et al.* Controllable conductivity of cuprous oxide semiconductor by tuning the deposition potential. Authorization Number: CN107204284B, China, June 25, 2019.
- Ying Yang, **Juan Han**, *et al.* Controllable conductivity of cuprous oxide semiconductor by tuning the concentration of surfactant. Authorization Number: CN104141159B, China, March 29, 2017.
- Xiaohui Ning, Ying Yang, **Juan Han**, *et al.* A kind thermostatic cell using for electrodeposited four samples. Authorization Number: CN203890478U, China, October 22, 2014.
- Ying Yang, **Juan Han**, *et al.* A two chambers and optical windows cell for electrochemical production of gas. Authorization Number: CN203080074U, China, July 24, 2013.

Invited Presentations

- Cysteine Determination Based on Fluorescence Resonance Energy Transfer of An Assembled Nanohybrid. 2020 **NDAS Annual Virtual Meeting**, ND.
- Two Readout Sensor using Eu^{3+} Coordinated MEH-PPV Polymer Dots for Copper Ions Detection. 2020 **Pittcon**, Chicago, IL.

- Detection and Characterization of [Ru(bpy)₃]²⁺-doped Silica Nanoparticles Using Single Particle Inductively Coupled Plasma Mass Spectrometry. 2019 **Pittcon**, Philadelphia, PA.
- Ultrasensitive Detection of Hg²⁺ Using Single Particle Inductively Coupled Plasma Mass Spectrometry 2018 **NDAS Annual Meeting**, ND
- Characterization of Gold Nanoparticles Using Sp-ICP-MS. 2017 **NDAS Annual Meeting**, ND.
- Photoelectrochemical stability improvement of Cu₂O thin film in water splitting by tuning morphology. 2014 **International Conference on Clean Energy**, Istanbul, Turkey.
- Photoelectrochemical stability improvement of Cu₂O thin film electrodeposited in aqueous solution. 2014 **National Conference on Solar Photochemistry and Photocatalysis**, Harbin, China.

Outreach

- Chemistry Fun Day, Grand Forks, North Dakota, 2/2018
- Ben Franklin Elementary School, Grand Forks, ND, 5/2017
- High School Students, Grand Forks, North Dakota, 3/2017

Honors and Awards

- 1st Place Award of Graduate Posters in ND Academy of Science Annual Meeting, 2020
- Best Paper Award in the 13th International Conference on Clean Energy, Istanbul, Turkey, 2014
- Excellent Graduation Thesis for B.S -- Hainan University, Jun 2011

Instrumental Skills

UV-Vis Spectrometer, Gas Chromatography, Gas Chromatography Mass Spectrometry, Inductively Coupled Plasma Mass Spectrometry, Scanning Electron Microscope, Transmission Electron Microscopy, Spectrofluorometer, Energy-Dispersive X-ray Spectroscopy, Zetasizer Analysis, EBT Surface area and Pore Size Analysis, Raman/Infrared spectroscopies, X-ray diffractometer, Mercury Analyzer, Microwave digestion system, X-ray Photoelectron Spectroscopy, PAR 283 Potentiostat, Electrochemical Workstation.

Publications

1. **Han, Juan**; Wu, Yingfen; Wu, Steven; Combs, Colin; Pierce, David; Zhao, Julia Xiaojun. A Sandwich Structured (Polymer Dots-Silica-Gold Nanoclusters) Ratiometric Fluorescent Nanoprobe for Accurate and Sensitive Detection of Cu^{2+} . (Submission)
2. Xiao Liu, **Juan Han**, *et al.* Eu-Coordinated Semiconducting Polymer Nanoparticles as a Two-Readout Nanoprobe for Copper Ions (II) Detection. *Sensors and Actuators B: Chemical*, **2021**, 344, 130194.
3. Yuqian Xing, **Juan Han**, Xu Wu, David T Pierce, Julia Xiaojun Zhao. Aggregation-based determination of mercury (II) using DNA-modified single gold nanoparticle, T-Hg (II)-T interaction, and single-particle ICP-MS. *Microchimica Acta*, **2020**, 187, 56.
4. Yuqian Xing, **Juan Han**, Xu Wu, David T Pierce, Julia Xiaojun Zhao. Graphene/gold nanoparticle composites for ultrasensitive and versatile biomarker assay using single-particle inductively-coupled plasma/mass spectrometry. *Analyst*, **2020**, 145, 7932-7940.
5. Xiao Liu, **Juan Han**, Xiaodong Hou, *et al.* One-pot synthesis of graphene quantum dots using humic acid and its application for copper (II) ion detection. *Journal of Material Science*, **2020**
6. Wang Sai, Liu Kouqi, **Han Juan**, *et al.* Investigation of Properties Alternation during Super-Critical CO_2 Injection in Shale. *Applied Science*. **2019**, 9(8).
7. **Juan Han**, *et al.* Mechanistic investigation on tuning the conductivity type of cuprous oxide (Cu_2O) thin films via deposition potential. *International Journal of Hydrogen Energy*, **2018**, 43, 13764-13777.
8. Ying Yang, **Juan Han**, Xiaohui Ning, *et al.* Photoelectrochemical stability improvement of cuprous oxide (Cu_2O) thin films in aqueous solution. *International Journal of Energy Research*, **2016**, 40, 112- 123.
9. Ying Yang, **Juan Han**, Xiaohui Ning, *et al.* Controllable morphology and conductivity of electrodeposited Cu_2O thin film: Effect of surfactants. *ACS Appl. Mater. Interfaces*, **2014**, 6(24), 22534– 22543.
10. Zuo-Xi Li, Gan Ye, **Juan Han**, Ying Yang, *et al.* 1D-3D Mixed- ligand frameworks with an unusual dmp topology tuned by bent angles of isomeric benzenedicarboxylates: magnetic properties, gas- dependent calcinations- thermolysis and energy storage performances. *Dalton Transactions*, **2015**, 44(19), 9209-20.
11. **Juan Han**, Chen Zhao, Mudan Wang, Jianqiang, Zhang, *et al.* CO_2 emission status and emission reduction analysis of China's cement

industry. *Natural Science Journal of Hainan University*, **2010**, 28(3), 253-256.

12. Jinwei Pang, **Juan Han**, et al. Control effect of honey on the loss of apples' vitamin C. *Natural Science Journal of Hainan University*, **2010**, 28(1), 72-74.
13. Zhenyi Liang, Yanlin Qin, **Juan Han**, et al. Method to get vertical scale factor of fractal interpolation in simulation of futures price curve. *Natural Science Journal of Hainan University*, **2009**, 27(2), 126- 128.
14. **Juan Han**, Xiaohui Ning, Hongsheng Tang, et al. Photoelectrochemical stability improvement of Cu₂O thin film electrodeposited in aqueous solution. 14th National Conference on Solar Photochemistry and Photocatalysis. **2014**
15. **Juan Han**, Xiaohui Ning, Hongsheng Tang, et al. Photoelectrochemical stability improvement of Cu₂O thin film in water splitting by tuning morphology. 13th International Conference on Clean Energy. **2014**