Curriculum vitae

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Research interests: ***Battery Materials (Li/Na/Mg ion batteries, All-solid-state Batteries); Hydrogen Energy; Energy Storage; Electrochemical Catalysis.***

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(Scopus) https://www.scopus.com/authid/detail.uri?authorId=7203046150

EDUCATION

June 2005 Ph.D. in Inorganic Chemistry, Peking University, China
Supervisor: Prof. Xingguo Li
Doctoral thesis title: Preparation and Properties of Nanostructured Magnesium-based Hydrogen Storage Materials

July 2000 B.S. in Materials Chemistry, Peking University, China

EMPLOYMENT HISTORY

August 2016-present Assistant and Associate Professor in Institute of Applied Physics and Materials Engineering (IAPME), University of Macau, Macau SAR, China
Research topic: Development of Next-Generation Energy Storage Materials and Systems

May 2011-July 2016 Assistant Professor in International Institute for Carbon-Neutral Energy Research (WPI-I^2CNER), Kyushu University, Japan
Research topic: Development of High Capacity Hydrogen Storage Materials for Onboard and Stationary Storage Applications

April 2009-April 2011 Postdoc in Department of Heterogeneous Catalysis, Max-Planck-Institut für Kohlenforschung, Germany
Supervisor: Prof. Dr. Ferdi Schüth, Dr. Michael Felderhoff
Research topic: Development, Upscaling and Testing of Nanocomposite Materials for Hydrogen Storage

Curriculum vitae

July 2005-March 2009 Postdoc in Energy Technology Research Institute, National Institute of Advanced Industrial Science and Technology, Japan
Supervisor: Dr. Etsuo Akiba
Research topic: Fundamental Research on Nanostructure and Reaction Mechanism of BCC Type Hydrogen Storage Alloys

TEACHING EXPERIENCE

2021-present Lecturer for ***Inorganic Chemistry*** (Undergraduate Compulsory course, APAC2003 spring), University of Macau, China
2017-present Lecturer for ***Green Energy for Global Society*** (General Education course, GEGA021, GEGA1006), University of Macau, China
2016-2017 Lecturer for ***Chemistry and Modern Society*** course (General Education course, CHEM111 and GEST014), University of Macau, China
2013-2015 Lecturer for ***Advanced Engineering A*** course to Global 30 Project students in English (autumn semesters in 2013, 2014 and 2015), Kyushu University, Japan
Responsibility: Giving lecture introducing research trend in this field; design of the lecture content; design of the class quiz; grading the students for the lecture.
2012-2016 Demonstration outreach on ***Energy Storage for Utilization of Renewable Power Based on Hydrogen Production, Hydrogen Storage and Fuel Cell Technologies*** to visitors and high school students in Kyushu University (total number of attendees 500-600), Japan
Contribution: Design and building of the demonstration system; giving lectures and demonstration to students and visitors; introducing research activities in the institute; Q&A.

FUNDING SUPPORT AS PRINCIPAL INVESTIGATOR

1. Shenzhen Science and Technology Innovation Committee - 2023 Shenzhen-Hong Kong-Macau Science and Technology Program (Category C), Research on structural stabilization strategy and scale-up of Li_xSi anode for high energy power lithium batteries, 2023.05-2025.04, 3,000,000 RMB (~434,000 USD).
2. Structural optimization strategy and industrialization development of pre-magnesiated and alloyed SiO based anodes for high performance lithium ion batteries, Guangdong Association For Science and Technology, Sep. 2023-Dec. 2025, 282500 MOP (~35,000 USD)
3. Drastic Fluorescence Enhancement of Metal-Organic Framework for Ultra-Efficient Detection of Trace Benzene Vapor and Device Manufacture, WUYI-UM joint project, 2023-08~2026-07 ((~21,000 USD).
4. Macao Science and Technology Development Fund (FDCT), Macau (Project No.: 0090 0090/2022/AFJ), “Exploration of advanced electrode materials for electrocatalytic urea synthesis", 2023. 1-2025.12 2,000,000 MOP (~250,000 USD)
5. Macao Science and Technology Development Fund (FDCT), Macau (Project No.: 0026/2022/AMJ), “Key technology development of high-safety, room temperature polyethylene oxide based solid-state lithium battery", 2022.11-2025.11 2,300,000 MOP (~288,000 USD)

6. The Multi-Year Research Grant (MYRG) from University of Macau, Macau (Project No.: MYRG-GRG2023-00140-IAPME-UMDF), “ Interfacial engineering of organic-inorganic hybrid solid-electrolyte interphase protected-LixSi for environmentally stable prelithiation reagents”, 2024.01-2025.12, 160,000 MOP (~20,000 USD).
7. Natural Science Foundation of Guangdong Province (2023A1515010765), China, Catalyst design: construction and application of volcano-type curves for lithium-sulfur batteries, 2023.01-2025.12 (~16,000 USD).
8. The Multi-Year Research Grant (MYRG) from University of Macau, Macau (Project No.: MYRG2022-00105-IAPME), “Interfacial charge transfer modulation of noble metal-free 2D/2D heterostructure materials for bi(tri)-functional electrocatalysis”, 2023.01-2024.12, 672,000 MOP (~84,000 USD).
9. Macao Science and Technology Development Fund (FDCT), Macau (Project No.: 0098/2020/A2), “Controllable synthesis of modified Li_xSi-based composite electrode and the application in high-energy lithium batteries”, 2021.06-2024.06 2,201,000 MOP (~274,000 USD)
10. Natural Science Foundation of Guangdong Province, China, Nonlinear Optical Properties and Application of $Cu_{3-x}P$ Nanocrystals, 2021.01-2023.12 (~16,000 USD).
11. Macao Science and Technology Development Fund (FDCT-GDST), Macau (Project No.:0019/2019/AGJ), “Development of Key Technologies for Soft-packed Lithium-ion Batteries for Wearable Electronic Products”, 2020-2022, 1,170,000 MOP (~146,000 USD)
12. The Multi-Year Research Grant (MYRG) from University of Macau, Macau (Project No.: MYRG2019-00055-IAPME), “A Exploratory Research on All-solid-state Mg Battery: Metastable Mg Nano Alloys as Cathode and $MgB_{12}H_{12}$-based Compounds as Solid Electrolyte”, 2020.01-2021.12, 750,000 MOP (~93,000 USD).
13. Macao Science and Technology Development Fund (FDCT), Macau (Project No.:062/2018/A2), “Metastable Ti-V-C Based Nano Alloys with NaCl-type Lattice for Innovative Lithium-Ion Battery Anode Materials Development”, 2018-2021, 1,788,000 MOP (~221,000 USD)
14. Macao Science and Technology Development Fund (FDCT), Macau (Project No.:118/2016/A3), “Innovative Development of Nanostructured Mg-Co Based Materials for Renewable Energy Storage”, 2017-2020, 1,905,000 MOP (~237,000 USD)
15. Start-up Research Fund from University of Macau, Macau (Project No.: SRG2016-00088-FST), “Design and Development of Hydrogen Storage Materials by Experiment and Simulation Approaches”, 2017-2020, 150,000 MOP (~18,700 USD)
16. Start-up and special fund for demonstration from IAPME, University of Macau, Macau, 2016, 2,304,000 MOP (~288,000 USD)
17. World Premier International Research Center Initiative (WPI) Start-Up funding, International Institute for Carbon-Neutral Energy Research (WPI-I^2CNER), Japan, “Development of High-Capacity Hydrogen Storage Materials for Onboard and Stationary Energy Storage”, 2011-2016, 13,000,000 JPY (~120,000 USD).
18. WPI Start-up Funding for Interdisciplinary Research, WPI-I^2CNER, Japan, “Demonstration of Utilization of Renewable Energy with Hydrogen Storage System”, 2011,

"Nano Processing and Properties of Mg-based Materials for Energy Storage", 2012, "NaCl-type Structure Ti-V-C Compounds for Hydrogen Storage", 2014, total budget 12,970,000 JPY (~120,000 USD).

19.Grants-in-Aid for Scientific Research from Japan Society for the Promotion of Science (JSPS), Japan (Project No.:23860034), "Structure and Properties of Mg-based BCC Type Hydrogen Storage Materials", 2011-2012, 3,250,000 JPY (~30,000 USD).

20.Other accepted competitive grants and supports include: WPI Competitive Support; WPI Travel Support; WPI Equipment Relocation Support; Kyushu University Travel Support; Demonstration Research on a Hydrogen-based Society through Collaboration among Industry, University, Government, and Local Community in Kyushu University 2011-2015; and Interdisciplinary Program in Education and Projects in Research Development in Kyushu University, 2015; etc. with a total amount of about 10,900,000 JPY (~100,000 USD).

Summary: as a principal investigator, achieved a total budget of ca. ~2,812,000 USD.

NOTE-WORTHY AWARDS

2023 Best paper award in 10 years, Journal of Magnesium and Alloys (SCI, IF=17.6), China

2023 2022"創客中國"國際中小企業創新創業大賽决赛-----亚軍

2022 中國（長沙）海外人才創新創業大賽-----總决賽，一等獎（綠色低碳賽道第一名）

2022 2022港澳臺創新創業大賽全國賽------三等獎 （第四名，港澳類企業第一名）

2022 第八届珠海"菁牛匯"創新創業大賽-----晋級决賽，三等獎

2022 2022前海粵港澳臺青年創新創業大賽-----最具潛力獎

2022 Multi-recommended awards (7), 2022 Macao Youth Innovation and Entrepreneurship Competition 2022 澳門青年創新創業大賽7項推送獎項, Macau.

2022 First Place, Macau Trials of ninth Guangdong-Hong Kong-Macao Greater Bay Area Youth Innovation and Entrepreneurship competition of "Dali Cup", 大瀝杯"第九届創青春粵港澳大灣區青年創新創業大賽澳門區選拔賽, Macau.

2021 Best paper award, Journal of Magnesium and Alloys (SCI, IF=10.088), China

2007 JSPS Fellowship, Japan Society for the Promotion of Science, Japan

2005 First Place Award, GE Foundation Edison Cup Technology Innovation Competition, China Scholarship Council, China/Institute of International Education, USA

PUBLICATIONS

1.Qingyuan Li, Huibo Wang, Yueyang Wang, Guoxing Sun, Zongjin Li, Yanyan Zhang, **Huaiyu Shao**, Yinzhu Jiang, Yuxin Tang, Rui Liang, Critical Review of Emerging Pre-etallization Technologies for Rechargeable Metal-Ion Batteries, ***Small***, 2024, in press.

2.J Shen, Y Zheng, W Lei, **Huaiyu Shao***, Unraveling the Fundamental Concepts of Superaerophobic/Superhydrophilic Electrocatalysts for Highly Efficient Water Electrolysis: Implications for Future Research, ***ChemElectroChem***, 2024, in press.

Curriculum vitae

3. Yuhan Song, Yinan Liu, Ziwen Zou, Zexu Wang, Yiwei Sun, **Huaiyu Shao**, Menglong Hao*, Fast Mg-based hydrogen storage with flow-through hydrogen as a cooling medium: A numerical study, ***International Journal of Hydrogen Energy***, 2024, in press.

4.B Li, L He, Y Guo, H Zhao, J Shen, W Lei, J Xu, **Huaiyu Shao***, High energy ball milling to synthesize transition metal vanadates with boosted lithium storage performance, ***Materials Today Communications***, 2023, 37. No. 107496. (Dec. 2023)

5.Ye Jiang, Jiangmin Jiang*, Ping Nie, Weijia Guo, Chao Geng, Zongfu Sun, Yi Fei, Yaxin Chen, Quanchao Zhuang, Zheng Xing*, Zhicheng Ju, **Huaiyu Shao***, Recent progress and prospects of pitch-based carbon anodes for alkali metal-ion (Li/Na/K) batteries, ***Journal of Energy Storage***, 2023, 72, No. 108484. (Nov. 25, 2023)

6.Yujung Chen, Peisen Liao, Kehan Jin, Yun Zheng, Huaiyu Shao and Guangqin Li, Current progress in metal–organic frameworks and their derivatives for electrocatalytic water splitting, Inorganic Chemistry Frontiers, 2023, 10, 6489-6505. (Nov. 21, 2023)

7.Qing Sun, Guifang Zeng, Jing Li, Shang Wang*, Marc Botifoll, Hao Wang, Deping Li, Fengjun Ji, Jun Cheng, **Huaiyu Shao**, Yanhong Tian*, Jordi Arbiol, Andreu Cabot*, and Lijie Ci*, Is Soft Carbon a More Suitable Match for SiOx in Li-Ion Battery Anodes? ***Small***, 2023, 19, No. 2302644. (Sep. 13, 2023).

8. Y Zheng, M Ma*, **Huaiyu Shao***, Recent advances in efficient and scalable solar hydrogen production through water splitting, Carbon Neutrality, 2023, 2, No. 23. (Sep. 11, 2023).

9.Yan Guo, Jing Li, Gaoqian Yuan, Junpo Guo, Yun Zheng, Yike Huang, Qi Zhang, Jielei Li, Jingjun Shen, Chenhao Shu, Jincheng Xu, Yuxin Tang, Wen Lei*, **Huaiyu Shao***, Elucidating the Volcanic Type Catalytic Behavior in Lithium Sulfur Batteries via Defect Engineering, ***ACS Nano***, 2023, 17, 18253–18265. (Sep. 5, 2023)

10.Lei Zhang, Shi Wang*, Qian Wang*, **Huaiyu Shao***, Zhong Jin*, Dendritic Solid Polymer Electrolytes: A New Paradigm for High-Performance Lithium-Based Batteries, ***Advanced Materials***, 2023, 35, 2303355. (Sep. 13, 2023)

11. Zhenjiang Liu, Haiyan Zhang*, Shangshang Zhang, Shengkai Li, **Huaiyu Shao**, Zhenghui Li, Precise surface selenizing modulation for amorphous MoP@MoSe2/SnP2O7 hierarchical nanofibers as sodium ion battery anode, ***Applied Surface Science***, 2023, 630, No. 157508. (Sep. 2023)

12.Ping Liang, Yihao Zheng*, Fengru Liu, **Huaiyu Shao**, Chaofan Hu, Bingfu Lei, Xuejie Zhang, Yingliang Liu, Jianle Zhuang*, and Xingcai Zhang*, General Synthesis of Carbon Dot-Based Composites with Triple-Mode Luminescence Properties and High Stability, ***JACS Au***, 2023, 3, 2291-2298. (Aug. 2023)

13.Yike Huang, **Huaiyu Shao***, et al. Li- and Mg-based borohydrides for hydrogen storage and ionic conductor, ***Journal of Materials Science & Technology,*** 2023, 153, 181-204. (Aug. 2023)

14.Yun Zheng, Junpo Guo, De Ning, Yike Huang, Wen Lei, Jing Li, Jianding Li, Götz Schuck, Jingjun Shen, Yan Guo, Qi Zhang, Hao Tian, Hou Ian, **Huaiyu Shao***, Design of Metal–Organic Frameworks for Improving Pseudo-Solid-State Magnesium-Ion Electrolytes: Open Metal sites, Isoreticular Expansion, and Framework Topology, ***Journal of Materials Science & Technology,*** 2023, 144, 15-27. (May 2023)

Curriculum vitae

15.Xiangyan Li, Bing Han**, Yucheng Zou, Ruohong Ke, Yonghong Deng, Sudong Wu, Yusheng Zhao, **Huaiyu Shao**, Junpo Guo, Meng Gu*, Observing the structural diversity of electrochemically deposited lithium metal in three dimensions, ***Journal of Power Sources***, 2023, 567, No. 232948.

16.Jingjun Shen, Jing Li, Bo Li, Yun Zheng, Xiaozhi Bao, Junpo Guo, Yan Guo, Chenglong Lai, Wen Lei, Shuangyin Wang, **Huaiyu Shao**[*], Ambient Fast Synthesis of Superaerophobic/Superhydrophilic Electrode for Superior Electrocatalytic Water Oxidation, ***Energy & Environmental Materials***, 2023, No. e12462. (Nov. 2023)

17.Dan Chan, Yunfei Liu, You Fan, Huibo Wang, Shi Chen, Tianwei Hao, Heng Li, Zhengshuai Bai, **Huaiyu Shao**, Guichuan Xing, Yanyan Zhang, Yuxin Tang, Functional Janus Membranes: Promising Platform for Advanced Lithium Batteries and Beyond, ***Energy & Environmental Materials***, 2023, No. e12451. (Sep. 2023)

18.Kang Chen, Hao Zhong, Liuzhang Ouyang[*], Fen Liu, Hui Wang, Jiangwen Liu, **Huaiyu Shao**[*], Min Zhu, Achieving a novel solvent-free regeneration of $LiBH_4$ combining hydrogen storage and production in a closed material cycle, ***Journal of Magnesium and Alloys***, 2023, 11, P1697-1708. (May 2023)

19.Yan Guo, Junpo Guo, Bo Li, Yun Zheng, Wen Lei, Jiangmin Jiang, Jincheng Xu, Jingjun Shen, Jielei Li and **Huaiyu Shao**[*], Metal Chelation Enables High-Performance Tea Polyphenol Electrodes for Lithium-Ion Batteries, Inorganics, 2023, 11, No. 148. (March. 2023)

20.Jianfei Chen, Haiyan Zhang*, Haowei Wang, Yingxi Lin, Yudie Tang, **Huaiyu Shao**, Shuqi Zhang, Design and construction of hollow nanocube NiMoO4 electrode with high performance for asymmetric supercapacitor, ***Journal of Nanostructure in Chemistry***, 2023, 13, 79-88. (Feb. 2023)

21.Xiaozhi Bao, Linqing Zhuo, Weikang Dong, Junpo Guo, Gang Wang, Bingzhe Wang, Qi Wei, Zongyu Huang, Jianding Li, Jingjun Shen, Jianhui Yu, Zhaogang Nie, Wencai Ren, Guanyu Liu, Guichuan Xing, **Huaiyu Shao**[*], Black Arsenic-Phosphorus Nanosheets for Highly Responsive Photodetection and Dual-Wavelength Ultrafast Pulse Generation at Telecommunication Band, ***ACS Applied Materials & Interfaces,*** 2022, 14 (46), 52270-52278.

22.Yun Zheng, Yang Xu, Junpo Guo, Jianding Li, Jingjun Shen, Yan Guo, Xiaozhi Bao, Yike Huang, Qi Zhang, Jincheng Xu, Jue Wu, Hou Ian, **Huaiyu Shao**[*], Cobalt Sulfide Nanoparticles Restricted in 3D Hollow Cobalt Tungstate Nitrogen-Doped Carbon Frameworks Incubating Stable Interfaces for Li-ion Storage, ***Electrochimica Acta***, 2022, No. 141134.

23.Jianding Li, Yun Zheng, Xiaozhi Bao, Liqing He, Haiyan Zhang, Yuxin Tang, **Huaiyu Shao**[*], Ultrasmall ZnO Nanocrystals Confined in Honeycombed N-Doped Carbon for High-Performance and Stable Lithium/Sodium Ion Batteries, ***Energy Technology***, 2022, No. 2200446.

24.Bingjie Ma, Cheng Tan, Liuzhang Ouyang, **Huaiyu Shao**, Naiguang Wang, Min Zhu, Microstructure and discharge performance of Mg-La alloys as the anodes for primary magnesium-air batteries, ***Journal of Alloys and Compounds***, 2022, No. 165803.

25.Huibo Wang, De Ning, Litong Wang, Heng Li, Qingyuan Li, Mingzheng Ge, Junyan Zou, Shi Chen, **Huaiyu Shao**, Yuekun Lai, Yanyan Zhang, Guichuan Xing, Wei Kong Pang, Yuxin Tang, In Operando Neutron Scattering Multiple-Scale Studies of Lithium-Ion Batteries, ***Small***, 18 (2022), No. 2107491.

Curriculum vitae

26. Yongyang Zhu, Hao Zhong, Liuzhang Ouyang, Jiangwen Liu, Hui Wang, **Huaiyu Shao***, Min Zhu, Synthesis of NaBH 4 as a hydrogen carrier from hydrated borax using a Mg–Al alloy, ***Inorganic Chemistry Frontiers***, 2022, 9, 370-378.

27.Yiwen Xie, Haiyan Zhang, Jiale Yu, Zhenjiang Liu, Shangshang Zhang, Huaiyu Shao, Yuliang Cao, Xifeng Huang, Shengkai Li, A Novel Dendrite-Free Lithium Metal Anode via Oxygen and Boron Codoped Honeycomb Carbon Skeleton, ***Small***, 18 (2022), No. 2104876.

28.Wen Lei, Heng Li, Yuxin Tang*, **Huaiyu Shao***, Progress and perspectives on electrospinning techniques for solid-state lithium batteries, ***Carbon Energy***, 2022, in press.

29.Jingxin Zhao, Zifeng Cong, Jun Hu, Hongyu Lu, Litong Wang, Huibo Wang, Oleksandr I. Malyi, Xiong Pu, Yanyan Zhang, Huaiyu Shao, Yuxin Tang, Zhong Lin Wang, Regulating Zinc Electroplating Chemistry to Achieve High Energy Coaxial Fiber Zn Ion Supercapacitor for Self-Powered Textile-based Monitoring System, ***Nano Energy***, 2021, 106893, ISSN 2211-2855, https://doi.org/10.1016/j.nanoen.2021.106893.

30.Bo Li, Jingjun Shen, Huajun Zhao, Wen Lei, Xueqing Yu, Jincheng Xu, Yuxin Tang, Haiyan Zhang, **Huaiyu Shao***, In-situ Formed Amorphous Manganese Vanadate Encapsulating MnO via Salt-assisted Ball Milling toward 3D Hierarchical Porous Electrodes for Superior Lithium Storage, ***Chemical Engineering Journal*** , 431 (2022) No. 133732.

31.Zhaoming Tong, Liang Huang, Junyan Guo, Haijun Zhang, Quanli Jia, Gaoran Li, Wen Lei, Huaiyu Shao, Shaowei Zhang, A spatially efficient “tube-in-tube” hybrid for durable sulfur electrochemistry, ***Journal of Materials Chemistry A***, 10, 2022, 5460-5469.

32.Jingjun Shen, Bo Li, Yun Zheng, Ziyi Dai, Jielei Li, Xiaozhi Bao, Junpo Guo, Xueqing Yu, Yan Guo, Mingzheng Ge, Wen Lei*, **Huaiyu Shao***, Engineering the Composition and Structure of Superaerophobic Nanosheet Array for Efficient Hydrogen Evolution, ***Chemical Engineering Journal***, 433 (2022) No. 133517.

33.Kang Chen, Jun Jiang, Liuzhang Ouyang*, Hui Wang, Jiangwen Liu, **Huaiyu Shao***, Min Zhu, Enhanced hydrogen generation from hydrolysis of MgLi doped with expanded graphite, ***Journal of Magnesium and Alloys***, 9 (2021) 2185-2193.

34.Huajun Zhao, Jun Wang, **Huaiyu Shao***, Kang Xu*, Yonghong Deng*, Gas Generation Mechanism in Li-Metal Batteries, ***Energy & Environmental Materials***, 2022, 5, P327-336. (Jan. 2011)

35.Huajun Zhao, Yunxian Qian, Guangfu Luo, Jian Chang, Chaoyang Wang, Jun Wang*, **Huaiyu Shao***, Yonghong Deng*, Cathode-anode reaction products interplay enabling high performance of $LiNi_{0.8}Co_{0.1}Mn_{0.1}O_2$/artificial graphite pouch batteries at elevated temperature, ***Journal of Power Sources***, 514 (2021) 230583. 1 December 2021.

36.Naiguang Wang, Jianwen Liang, Jingjing Liu, Yixiang Huang, **Huaiyu Shao**, Qiong Cai, Mingchang Hu, Zhicong Shi, AS61 Magnesium Alloy with Nano-Scale Mg_2Sn Phase as a Novel Anode for Primary Aqueous Magnesium Battery, ***Journal of the Electrochemical Society***, 168 (2021). No. 100537. October 2021.

37.Xiaozhi Bao, Tian Sun, Yan Liu, Chuan Xu, Weiliang Ma, Junpo Guo, Yun Zheng, Shivananju Bannur Nanjunda, Huating Liu, Zongyu Huang, Shaojuan Li, Shenghuang Lin, Guichuan Xing, Wencai Ren*, Qiaoliang Bao*, **Huaiyu Shao***, A graphene–Mo_2C heterostructure for a highly

responsive broadband photodetector, ***Physical Chemistry Chemical Physics***, 40 (2021) 23024-23031. 28 Oct. 2021.

38.Junpo Guo, Dongqi Dong, Jun Wang*, Dan Liu, Xueqing Yu, Yun Zheng, Zhaorui Wen, Wen Lei, Yonghong Deng, Jie Wang*, Guo Hong* and **Huaiyu Shao***, Silicon-based lithium ion battery system: state of the art from half and full cell viewpoint, ***Advanced Functional Materials***, 31 (2021), 2102546. August 20, 2021.

39.Zhenjiang Liu, Haiyan Zhang, Shangshang Zhang, Jiale Yu, Shengkai Li, **Huaiyu Shao**, Yudie Tang, Daofeng Wen & Zhenghui Li, Facile Preparation of MoP/TiO_2 Composite by Electrospinning Method for Sodium Ion Battery Anode, ***Materials Research Letters***, 9 (2021), 382-390. 07/2021.

40.Cheng Lin, Liuzhang Ouyang*, Renzong Hu, Jun Liu, Lichun Yang, **Huaiyu Shao***, Min Zhu, Synthesis of amorphous SeP_2/C composite by plasma assisted ball milling for high-performance anode materials of lithium and sodium-ion batteries, ***Progress in Natural Science: Materials International***, 31 (2021), 567-574. August 2021.

41.Huajun Zhao, Yunxian Qian, Shiguang Hu, Guangfu Luo, Chenxi Nie, Peiqi Qiu, Yuanyuan Kang, Han Wang, Yanli Chu, Qingrong Wang, Jun Wang, **Huaiyu Shao***, Kang Xu*, Yonghong Deng*, Tale of Three Phosphate Additives for Stabilizing NCM811/Graphite Pouch Cells: Significance of Molecular Structure-Reactivity in Dictating Interphases and Cell Performance, ***ACS Applied Materials and Interfaces***, 2021, 13(25), 29676-29690.

42.Xueqing Yu, Junpo Guo, Bo Li, Jincheng Xu, Peng Gao*, Kwan San Hui, Kwun Nam Hui*, **Huaiyu Shao***, Sub-Nanometer Pt Clusters on Defective NiFe LDH Nanosheets as Trifunctional Electrocatalysts for Water Splitting and Rechargeable Hybrid Sodium–Air Batteries, ***ACS Applied Materials and Interfaces***, 2021, 13(23), 26891-26903.

43.Bo Li, Xiaomin Huang, Jianding Li, Huajun Zhao, Xueqing Yu, Qinghao Qin, Jincheng Xu, Wen Lei, Dongyu Feng, Yonghong Deng, Jinlong Zheng, Yuncai Chen, Ning Wang*, **Huaiyu Shao***, Design of Pseudocapacitance and Amorphization Co-Enhanced Mn_3O_4/Graphene Sheets Nanocomposites for High-Performance Lithium Storage, ***Applied Surface Science***, 2021, 563, 150199.

44.Jianding Li, Yun Zheng, **Huaiyu Shao***, Co/N dual hybrid strategy for superior capacity and long cyclic stability Li^+/K^+ storage of ZnO/N-doped carbon nanosheet framework, ***Journal of Alloys and Compounds***, 2021, 879, 160438.

45.J. Zou, Y. Zhang, S. Chen, **H. Shao**, Y. Tang*, Recent Development on Surface-interface Chemistry of All-solid-state Lithium Batteries, ***Chemical Journal of Chinese Universities***. 2021, 42, 1005-1016.

46.Yudie Tang, Haiyan Zhang*, Shangshang Zhang, Lun Li, Zhenjiang Liu, Zhenghui Li, Junyao Shen, **Huaiyu Shao**, High Performance Anode for Sodium-Ion Batteries: Calcium Pre-Intercalated Layered Vanadium Oxide/Carbon composite, ***Chemical Engineering Journal***, 2021, 424, 130378.

47.Chunyan Cao, Huilong Dong, Fanghua Liang, Yu Zhang, Wei Zhang, Hailou Wang, Huaiyu Shao, Hongchao Liu, Kai Dong, Yuxin Tang, Yuekun Lai, Mingzheng Ge, Interfacial reinforcement structure design towards ultrastable lithium storage in MoS_2-based composited electrode, ***Chemical Engineering Journal***, , 2021, 416, 129094.

48.Guanyu Liu, Xiaozhi Bao (co-first author), Weikang Dong, Qi Wei, Haoran Mu, Wenguo Zhu, Bingzhe Wang, Jianding Li, Babar Shabbir, Yuan Huang, Guichuan Xing, Jianhui Yu, Peng Gao,

Curriculum vitae

Huaiyu Shao*, Xiangping Li*, and Qiaoliang Bao*, Two-Dimensional $Bi_2Sr_2CaCu_2O_{8+\delta}$ Nanosheets for Ultrafast Photonics and Optoelectronics, ***ACS Nano***, 2021, 15(5), 8919-8929.

49.Yun Zheng, Jianding Li, Bingpu Zhou*, Hou Ian*, **Huaiyu Shao***, Advanced sensitivity amplification strategies for voltammetric immunosensors of tumor marker: State of the art, ***Biosensors and Bioelectronics***, 178 (2021) 113021.

50.Bannur N. Shivananju, Lu Zhou, Yuefeng Yin, Wenzhi Yu, Babar Shabbir, Haoran Mu, Xiaozhi Bao, Yiqiu Zhang, Sun Tian, Qingdong Ou, Shaojuan Li, Mohammad M. Hossain, Yupeng Zhang, **Huaiyu Shao**, Guichuan Xing, Nikhil V. Medhekar, Chang-Ming Li, Jian Liu, Qiaoliang Bao*, Probing the dynamic structural changes of DNA using ultrafast laser pulse in graphene-based optofluidic device, ***InfoMat***. 3 (2021) 316-326.

51.D.F. Wu, L.Z. Ouyang*, J.M. Huang, J.W. Liu, H. Wang, X.S. Yang, **H. Shao***, M. Zhu, Improvement on hydrogen generation properties of $Zr(BH_4)_4{\cdot}8NH_3$, ***Progress in Natural Science: Materials International***, 2021, 31(1): 41-46.

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6. (Book Chapter) **Huaiyu Shao**, Stephen M Lyth, Solid Hydrogen Storage Materials: High Surface Area Adsorbents, ***Hydrogen Energy Engineering***, P241-251. Springer Japan, 2016.
7. (Special Issue) Jianxin Zou, Craig Buckley, **Huaiyu Shao**, Gang Ji, and Kemin Zhang (editors), ***Light-Metal-Based Nanostructures for Energy and Biomedical Applications***, Special Issue in ***Journal of Nanomaterials*** (impact factor 2.207), Hindawi Publishing Corporation, Egypt, 2013.
8. (Book Chapter) **Huaiyu Shao**, Hydrogen Storage System of Metal Hydrides, ***Hydrogen and Hydrogen Energy***, Chapter 8.1-4, P209-247, China Machine Press, Beijing, China, 2012.
9. (Book Chapter) Xingguo Li, **Huaiyu Shao** and Tong Liu, Synthesis of Nanoparticles and Their Properties by Hydrogen Plasma Metal Reaction, ***Trends in Nanotechnology Research***, Chapter 5, P99-132, Nova Science Publishers, New York, USA, 2004, ISBN 1-59454-091-8.

ORAL PRESENTATIONS FOR INTERNATIONAL CONFERENCES ETC.

1. **Plenary talk**, Mg-based Nanomaterials for Energy Storage, 20th European Annual Conference on Advanced and Energy Materials, Osaka, Japan, Oct. 7-8, 2019.
2. **Invited talk,** Relatively Stable Metastable Nano Alloys for Energy Storage, Chinese Materials Conference 2019, Chengdu, Sichuan, China, July 10-14, 2019.
3. **Keynote talk**, Mg and Ti Based Metastable Nano Alloys for Energy Storage Development, 2nd International Seminar on Materials Science and Application, Shanghai, China, Dec. 2018.
4. **Invited talk,** Relatively Stable Metastable Nano Alloys for Energy Storage, 16th International Symposium on Metal-Hydrogen Systems (MH2018), Guangzhou, China, Nov. 2018.
5. **Keynote talk**, Metastable Nano Alloys for Hydrogen Storage, 2018 Joint Annual Conference of Physical Societies in Guangdong-Hong Kong-Macao Greater Bay Area, Macau, Macau SAR (China), July 27, 2018.
6. **Invited talk**, **organizing committee member**, Downsizing in Mg-based Materials for Hydrogen Storage, The 14th Cross-Strait Workshop on "Nano Science and Technology" (CSWNST14), Macau, Macau SAR (China), June 23, 2018.
7. **Keynote talk**, **organizing committee member**, Nanotechnology in Mg-based hydrogen storage materials, International Conference on Nanoscience & Technology, New York, USA, May 21-22, 2018.
8. **Keynote talk**, **international technical committee member,** Mg-based Hydrogen Absorption Materials with Unique Structures for Energy Storage, 2018 International Conference on Environmental and Energy Engineering, Xiamen, China, March 2018.
9. **Keynote talk**, Downsizing in Mg-based Hydrogen Storage Materials for Kinetics Enhancement and Thermodynamics Tailor, 2nd International Conference on Materials Research and Engineering, Shanghai, China, Dec. 2017.

10.**Invited talk,** Hydrogen and Fuel Cell Technologies for Energy Storage, Shanghai Jiao Tong University, Shanghai, China, Dec. 2017.
11.**Invited talk,** Hydrogen and Fuel Cell Technologies for Energy Storage, Shanghai University, Shanghai, China, Dec. 2017.
12.**Invited talk,** Hydrogen and Fuel Cell Technologies for Energy Storage, Jinan University, Dec. 2017.
13.**Invited talk,** Hydrogen and Fuel Cell Technologies for Energy Storage, Sun Yat-sen University, Guangzhou, China, Dec. 2017.
14.**Invited talk**, Mg-based Hydrogen Storage Materials for Onboard and Stationary Energy Storage, 2017 Frontiers in Materials Processing Applications, Research and Technology, Bordeaux, France, July 2017.
15.**Invited talk**, Development of Mg-based Materials for Stationary Energy Storage, the 4th International Expo and Conference on Energy Storage in China, Beijing, China, March 2017.
16.**Plenary lecture, international technical committee member, session chair**, Nano Processing and Catalysis in Mg-based Materials for Hydrogen Storage, 2017 International Conference on Environmental and Energy Engineering, Suzhou, China, March 2017.
17.**Speaker**, Onboard and Stationary Hydrogen Energy Storage in Nanostructured Mg-based Materials, International Workshop on Functional Materials 2016, Macau, December 2016.
18.**Speaker**, **responsible local organizer,** Downsizing and Geometrical Effect for Hydrogen Storage, Macau Summit on Carbon and Energy Materials 2016, Macau, November 2016.
19.**Invited talk**, Mg-based Hydrogen Storage Materials-From Onboard to Stationary Applications, Nanjing Tech University, China, July 2016.
20. **Invited talk**, **session organizer and chair,** Onboard and Stationary Hydrogen Energy Storage in Nanostructured Mg-based Materials, International Conference on Small Science, Prague, Czech, June 2016.
21. **Speaker, session vice-chair**, Nano Processing in Mg-based Materials for Energy Storage Applications, 2nd Annual World Congress of Smart Materials-2016, Singapore, March 2016.
22. **Invited talk,** Nanotechnology and Catalysis in Mg-based Materials for Hydrogen Storage, Dalian Institute of Chemical Physics (DICP), Chinese Academy of Sciences (CAS), November 2015.
23. **Speaker,** Effect of Nanostructure and Catalysis on Kinetics, Thermodynamics and Reaction Pathway in Mg-based Hydrogen Storage Materials, the 4th Global Conference on Materials Science and Engineering (CMSE2015), Macau, China, August 2015.
24. **Invited talk,** NaCl-type Structure Ti-V-C Based Materials for Hydrogen Storage, Gordon Research Conference (on Hydrogen-Metal Systems), Easton, MA, USA, July 2015.
25. **Invited talk,** Nanotechnology and Catalysis in Mg-based Materials for On-board and Stationary Energy Storage, Qingdao Institute of Bioenergy and Bioprocess Technology, Chinese Academy of Sciences (CAS), June 2015.
26. **Speaker**, Nanotechnology in Mg-based Materials for Hydrogen Storage, TechConnect World Innovation Conference, Washington D.C., USA, June 2015.
27. **Speaker, session chair**, Mg-based Hydrogen Storage Materials for Energy Storage of Renewable Power, Grand Renewable Energy 2014, Tokyo, Japan, July 2014.

28. **Speaker**, Kinetics Enhancement, Thermodynamics Tailor and Thermal Conductivity Study in Mg-based Hydrogen Storage Materials, International Symposium on Metal-Hydrogen Systems, Manchester, UK, July 2014.
29. **Speaker, session organizer and chair**, Mg-based Hydrogen Storage Nanomaterials: Kinetics, Thermodynamics, and Applications, U.S. National Congress on Theoretical and Applied Mechanics (USNCTAM2014), Lansing, MI, USA, June 2014.
30. **Invited talk**, Nanotechnology and Catalysis in Mg-based Materials for Hydrogen Storage: Kinetics, Thermodynamics and Thermal Conductivity, 2014 Energy Material Nanotechnology East Meeting, Beijing, China, May 2014.
31. **Speaker**, Geometrical Effect Study in Mg-based BCC Structure Materials for Hydrogen Storage, the 8th International Symposium on Hydrogen and Energy, Zhaoqing, Guangdong, China, February 2014.
32. **Speaker, session chair**, Geometrical Effect Clarification in Mg-based BCC Structure Hydrogen Storage Materials, International Conference on Hydrogen Production 2014, Fukuoka, Japan, February 2014.
33. **Invited talk, symposium organizer and chairman**, Geometrical Size Effect in Mg-based BCC Structure Hydrogen Storage Materials, the 1st International Young Scientists Fusion Forum, Chengdu, China, October 2013.
34. **Plenary lecture**, **Committee Vice-Chairman**, Kinetics, Thermodynamics and Thermal Conductivity in Mg-based Hydrogen Storage Nanomaterials, the 12th China International Nano-Science and Technology Symposium, Chengdu, China, October 2013.
35. **Invited talk, session chair**, A Novel Energy Storage Concept based on Mg-based Hydrogen Storage Materials, World Hydrogen Technology Conference (WHTC) 2013, Shanghai, China, September 2013.
36. **Invited talk**, Mg-based Hydrogen Storage Materials: Kinetics, Thermodynamics, Thermal Conductivity and Applications, European-Materials Research Society (E-MRS) 2013 Fall, Warsaw, Poland, September 2013.
37. **Invited talk, session organizer and chair**, Geometrical Effect Study in Mg-based BCC Structure Nanomaterials, American Chemical Society (ACS) National Meeting 2013 Fall, Indianapolis, Indiana, USA, September 2013.
38. **Invited talk**, Nanotechnology and Catalysis in Mg-based Materials for Onboard and Energy Storage, University of Chinese Academy of Sciences, Beijing, China, Nov. 2012.
39. **Speaker**, Catalytic Effect Study on $MgH_2/LiBH_4$ Nanocomposites, International Symposium on Metal-Hydrogen Systems 2012, Kyoto, Japan, October 2012.
40. **Invited talk**, Development of Mg-based Nanomaterials for Onboard and Stationary Hydrogen Storage, Shanghai Jiaotong University, Shanghai, China, September 2012.
41. **Speaker**, Development of Mg-based Nanomaterials for Energy Storage, National Hydrogen Conference, Nanjing, Jiangsu, China, September 2012.
42. **Speaker**, Development of Mg-based High-temperature Energy Storage System, Japan Institute of Metals and Materials (JIM) 2012 Fall meeting, Matsuyama, Japan, Sep. 2012.
43. **Invited talk**, Development of Mg-based Nanomaterials for Onboard and Stationary Hydrogen Storage, Ford Motor Company, Dearborn, MI, USA, September 2012.

44. **Speaker**, Catalyzed Nanostructure Mg-based Materials for Energy Storage, the 2nd Asian Symposium on Hydrogen Storage Materials, Jeju, Korea, April 2012.
45. **Speaker**, Applications of Metal Hydrides for Energy Storage, I^{2}CNER International Workshop, Kyushu University, Japan, February 2012.
46. **Invited talk**, Development of Nanostructure Mg-based Materials for Energy Storage, Peking University, Beijing, China, November 2011.
47. **Invited talk**, Development of Nanostructure Mg-based Materials for Energy Storage, Shanghai University, Shanghai, China, November 2011.
48. **Speaker**, Nanotechnology in Mg-based Materials for Hydrogen Storage, Japan Institute of Metals and Materials (JIM) 2011 Fall, Naha, Japan, November 2011.
49. **Plenary lecture**, Nanotechnology and Catalysis in Mg-based Materials for Energy Storage, the 10th China International Nano-Science and Technology Symposium, Hangzhou, China, October 2011.
50. **Invited talk**, Research on Nanostructure Mg-based Materials for Energy Storage, Zhejiang University, China, October 2011.
51. **Speaker**, Nanotechnology in Study of Mg-based Hydrogen Storage Materials, the 1st Asian Symposium on Hydrogen Storage Materials, Hangzhou, China, May 2011.
52. **Speaker**, $LiBH_4$ and Ti-catalyzed Nanocrystalline MgH_2 Composite for Hydrogen Storage, the 5th International Symposium on Hydrogen and Energy, Stoos, Switzerland, January 2011.
53. **Plenary lecture**, Nanotechnology in Hydrogen Storage Study, the 9th China International Nano-Science and Technology Symposium, Xi'an, Shanxi, China, November 2010.
54. **Invited talk**, Preparation, Property and Application of Nanostructured Hydrogen Storage Materials, Shanghai University, Shanghai, China, December 2008.
55. **Speaker**, Hydrogen Storage Properties and Mechanism Study of Mg-Co BCC Alloys, AsiaNano 2008, Singapore city, Singapore, November 2008.
56. **Speaker**, Preparation, Hydrogen Storage Properties and Mechanism Study of Mg-Co BCC Alloys, Japan Institute of Metals and Materials (JIM) 2008 Fall, Kumamoto, Japan, September 2008.
57. **Speaker**, Fabrication, Properties and Mechanism Study of Mg-Co-based BCC Alloys, International Symposium on Metal-Hydrogen Systems 2008, Reykjavik, Iceland, June 2008.
58. **Speaker**, Preparation, Properties and Mechanism Study of Mg-Co-based BCC Alloys, Materials Research Society (MRS) 2007 Fall, Boston, USA, November 2007.
59. **Speaker**, Preparation, Properties and Mechanism Study of Mg-Co-based BCC Alloys, the 6th Pacific Rim International Conference on Advanced Materials and Processing (PRICM6), Jeju, Korea, November 2007.
60. **Speaker**, Preparation and Hydrogen Properties Study of Mg-based BCC Alloys, Renewable Energy Conference 2006, Makuhari, Chiba, Japan, October 2006.

PROFESSIONAL ORGANIZATION MEMBERSHIPS

- American Chemical Society (ACS)
- Japan Institute of Metals and Materials (JIM)

- Physical Society of Macao (PSM)

PROFESSIONAL SERVICES

- Conference organizing experience:
  - 2022, 第二届海峡两岸暨港澳能源青年论坛, organizing committee member;
  - 2021, International Conference on Frontier Materials 2021, Academic Committee;
  - June 2018, The 14th Cross-Strait Workshop on "Nano Science and Technology" (CSWNST14), Macau, Macau SAR (China), organizing committee member;
  - 2018 International Conference on Nanoscience & Technology, New York, USA, May 2018, organizing committee member;
  - 2018 International Conference on Environmental and Energy Engineering, Xiamen, China, March 2018, international technical committee member;
  - 2017 International Conference on Environmental and Energy Engineering, Suzhou, China, March 2017, international technical committee member, session chair;
  - 2016 Macau Summit on Carbon and Energy Materials, Macau, China, Nov. 2016, responsible local organizer;
  - 2016 International Conference on Small Science, Prague, Czech, June 2016, session organizer and chair;
  - 2014 U.S. National Congress on Theoretical and Applied Mechanics (USNCTAM2014), Lansing, MI, USA, June 2014, session organizer of Mechanics of Energy Storage session;
  - 2013 the 1st International Young Scientists Fusion Forum, Chengdu, China, October 2013, symposium organizer and chairman;
  - 2013 the 12th China International Nano-Science and Technology Symposium, Chengdu, China, October 2013; Committee Vice-Chairman;
  - 2013 American Chemical Society (ACS) National Meeting 2013 Fall , Indianapolis, USA, Sep. 2013, session organizer of Hydrogen Energy session; etc.
  - Editorial (Youth Editorial) Board ***Journal of Magnesium and Alloys (IF=17.6), Frontiers in Energy Research (IF=3.858), Metals (IF=2.9), Inorganics (IF=2.9), etc. Journals.***
- ***Editor for Book of "Hydrogen Storage: Preparation, Applications and Technology" by Nova Scientific Publishers (New York, USA).***
- ***Lead guest editor for a special issue of "Next-Generation Energy Storage Materials Explored by Advanced Scanning Techniques" for SCI journal of Scanning (Impact Factor: 1.242, Wiley-Hindawi).***
- Reviewer for ***Nature Communications, Science Advances, Nano Energy, Energy Storage Materials, ACS Applied Materials & Interfaces, Journal of Materials Chemistry A, Nanoscale, Chem. Com. Nanotechnology, Journal of Power Sources, Journal of Magnesium and Alloys, International Journal of Hydrogen Energy, Materials and Design, Journal of Physics, D: Applied Physics, Materials, Journal of Nanoscience and Nanotechnology, Journal of Energy Chemistry, Electrochimica***

Acta, Energies, Journal of Solid State Chemistry, Renewable Energy, Materials Research Express, Journal of Physics and Chemistry of Solids, Journal of Alloys and Compounds, Materials Chemistry and Physics, Arabian Journal of Chemistry, Green, Vacuum, Journal of Thermal Analysis and Calorimetry, Results in Physics, The Journal of Physical Chemistry, Journal of Energy Engineering, Journal of Nanomaterials, Chemical physics, Solid State Ionics, etc. over 70 SCI journals.

- Grant proposal reviewer for ***LE STUDIUM*** (**France,** co-financing from the European Union Horizon 2020 and the Marie Skłodowska-Curie Actions (MSCA)), ***Romanian National Research Council***.