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Engineering & Scientific Consulting

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Professional Profile

Dr. Yan's expertise focuses on Nano/Micro-electromechanical systems (N/MEMS). He has whole process N/MEMS devices development experience from simulation (COMSOL, ANSYS) to design (L-edit) to fabrication in Class 100/1000 clean room. During his postgraduate study, he mainly researched the design, experimental measurement, theoretical study, and modeling of nonlinear motion of N/MEMS resonators.

Dr. Yan is skilled in constructing electro-optical test beds for electrical and mechanical elements with or without high vacuum and cryogenic environments. That was highly relied on his knowledge about mechanical component design (CAD, Solid works), PCB design, thermal conducting or preventing, and fiber optics. Based on his broad knowledge of analog and digital circuits, data analysis, automated measurement (LabVIEW, MATLAB), noise mitigation, signal amplification and proportion integration differentiation (PID) control, Dr. Yan conducted projects to precisely measure and control nanoscale vibration and piconewton-level forcees. He is also intimately familiar with modeling nonlinear systems using MATLAB, Python, and C++.

Dr. Yan also has a background in developing and utilizing functional materials for power devices such as supercapacitors and fuel cells. He has extensive experience in materials characterization techniques, including scanning electron microscopy (SEM), energy dispersive X-ray spectroscopy (EDS), X-ray diffraction (XRD), electrochemical testing technique, and power device assembly. Using these skills, Dr. Yan developed new approaches to make nano/micro porous metal materials and apply them in new applications, such as high-performance supercapacitors, Raman enhancement, and fuel cells.

Academic Credentials & Professional Honors

Ph.D., Physics, Hong Kong University of Science and Technology (HKUST), 2023

B.S., Applied Physics, Harbin Institute of Technology, 2017

Prior Experience

Part-Time Research Assistant, Physics Department in HKUST, 2020-2022

Professional Affiliations

American Physical Society (APS), Member

Languages

Chinese (China)

Patents

A Method To Prepare Porous Metal Using Mixed Gas, Chinese Patent. CN105506335 A

Publications

Yingming Yan, X. Dong, L. Huang, K. Moskvovtsev and H. B. Chan, Energy Transfer into Period-Tripled States in Coupled Electromechanical Modes at Internal Resonance, Phys Rev X 12, 031003 (2022)

Y. Yan, B. Zhang, X. Dong, M. I. Dykman and H. B. Chan, Frequency stabilization of self-sustained oscillations in sideband-driven electromechanical resonators, Abstract in Frontiers of Nanomechanical Systems, Online, Jan 19-21, 2021

G. Ao, Y. Yan*, P. Zhao, Z. Pan, Z. Lv, and Z. Wang, Enhanced Redox and Reoxidation Tolerances of Ce_{0.8}Gd_{0.2}O_{1.9} Electrolyte for Ni Cermet Anodes in Single-Chamber SOFCs, J. Solid State Electrochem. 26, 865 (2022).

F. Cao, Z. Wang, Y. Wang, Y. Yan, M. Liu, L. Li, G. Ao, K. Chen, and Z. Lv, In Situ Fabrication of Cellular Architecture on Silver Metals Using Methane/Oxygen Gas Mixture and Its Application for Energy Storage, ELECTROCHIMICA ACTA 280, 25 (2018).

Z. Wang, F. Cao, K. Chen, Y. Yan, Y. Chen, Y. Zhang, X. Zhu, B. Wei, Y. Xiong, and Z. Lv, Cellular Structure Fabricated on Ni Wire by a Simple and Cost-Effective Direct-Flame Approach and Its Application in Fiber-Shaped Supercapacitors, ChemSusChem 11, 985 (2018).

F. Cao, Z. Wang, Y. Chen, Y. Yan, Y. Wang, J. Lv, Y. Zhang, Y. Zhang, and Z. Lü, Cellular Ni Sheet Created by a Simple Oxidation-Reduction Process for Enhanced Supercapacitor Performance, J. Alloys Compd. 711, 287 (2017).

Z. Wang, Y. Yan, Y. Chen, W. Han, M. Liu, Y. Zhang, Y. Xiong, K. Chen, Z. Lv, and M. Liu, 3D-Hierarchical Porous Nickel Sculptured by a Simple Redox Process and Its Application in High-Performance Supercapacitors, J. Mater. Chem. A 5, 20709 (2017).

Z. Wang, Y. Yan, M. Liu, Y. Chen, W. Han, H. Bian, Y. Qiao, Y. Xiong, and Z. Lv, Rapid Porosity Formation of Silver under SOFC Conditions in Methane-Oxygen Mixed Gas, Int. J. Hydrog. Energy 41, 22344 (2016).

Presentations

Yingming Yan, X. Dong, L. Huang, K. Moskvovtsev, H. B. Chan. Period-Tripled oscillations in Coupled Electromechanical Modes at Internal Resonance. 15th Asia Pacific Physics Conference (APPC15), Online. Aug 21-26, 2022