学生奖励及荣誉

（一）学科竞赛获奖

1.2022年全国高校商业精英挑战赛品牌策划竞赛全国总决赛暨（新加坡）全球品牌策 划大赛中国地区选拔赛国家级一等奖，宋丽敏，2022.05

证　书

中原工学院的参赛作品《慈周小镇品牌策划书》荣获 2022 年全国高校商业精英挑战赛品牌策划竞赛全国总决赛暨（新加坡）全球品牌策划大赛中国地区选拔赛

一等奖

团队学生成员：秦柯怡、朱焱格、李楠、郭鹏飞

最佳指导教师：宋丽敏、段瑞旋

2.2023年全国高校商业精英挑战赛品牌策划竞赛全国总决赛暨（新加坡）全球品牌策 划大赛中国地区选拔赛国家级一等奖，宋丽敏，2023.05

证　书

中原工学院的参赛作品《万岁果园品牌策划案》荣获 2023 年全国高校商业精英挑战赛“中国科信杯”品牌策划竞赛全国总决赛暨（新加坡）全球品牌策划大赛中国地区选拔赛

一等奖

团队学生成员：闫建宇、范淼、董志彰、闫烨丰、张珂

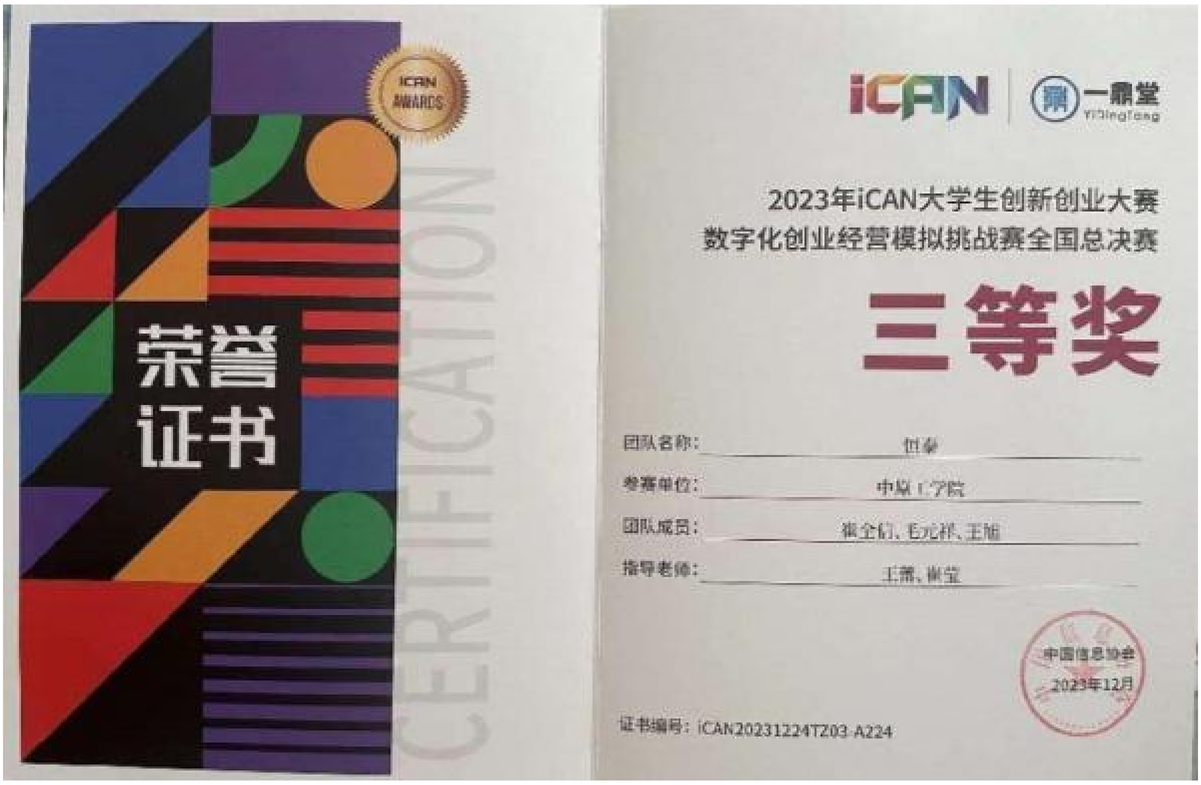
最佳指导教师：宋丽敏、王蕾

3.2023年全国高校商业精英挑战赛品牌策划竞赛全国总决赛暨（新加坡）全球品牌策 划大赛中国地区选拔赛国家级三等奖，王蕾，2023.05

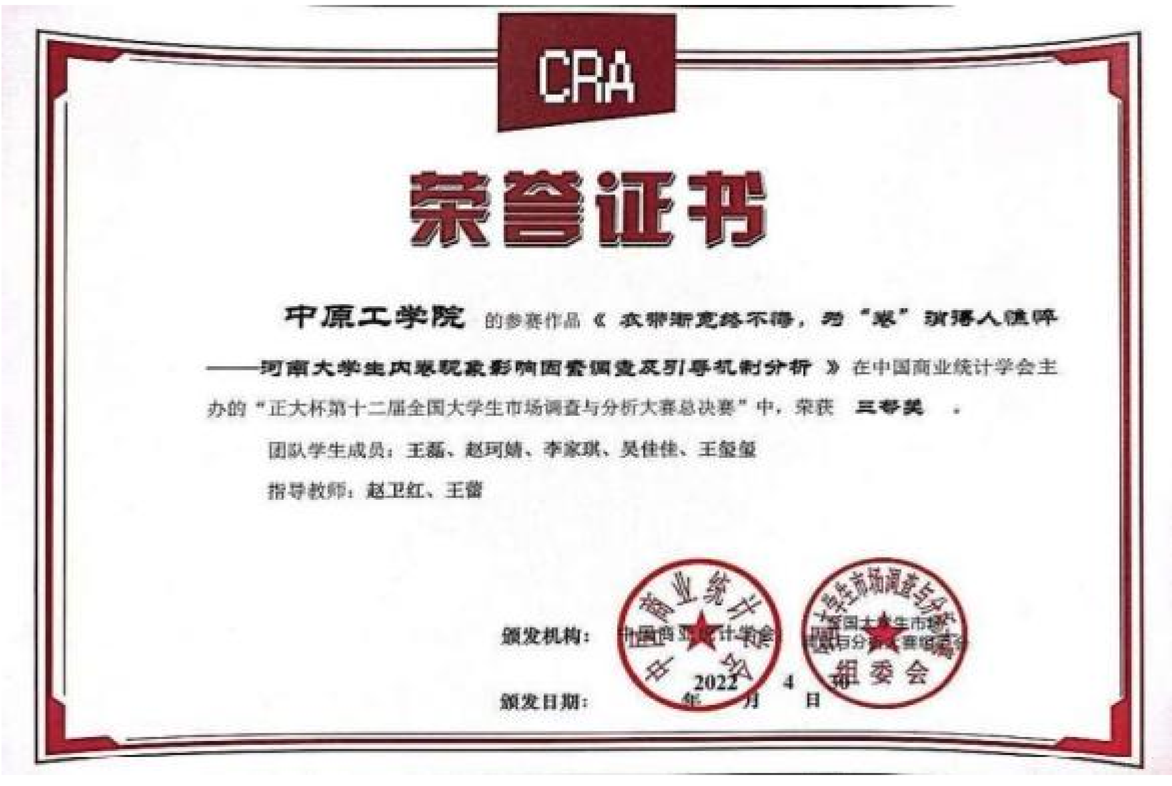
4.正大杯第十二届全国大学生市场调查与分析大赛总决赛国家级三等奖,宋丽敏， 2022.04

5.第九届中国TRIZ杯大学生创新方法大赛—自动饮品调制售货机国家级三等奖,赵慧君,2021.12

6. Ican大学生创新创业大赛数字化创业经营模拟挑战赛国家级三等奖，王蕾，2023.12



7. 正大杯第十二届全国大学生市场调查与分析大赛总决赛国家级三等奖，王蕾，2022.4



8. 正大杯第十二届全国大学生市场调查与分析大赛总决赛省级一等奖, 宋丽敏，

2022.04


CRA

荣誉证书

中原工学院 的参赛作品《因爱而起，以爱之名——郑州市青少年[illegible]现状分析及正向引导措施》在中国商业统计学会主办的"正大杯第十二届全国大学生市场调查与分析大赛河南赛区本科组选拔赛"中，荣获 省一等奖。

团队学生成员：李宁怡、李梦姣、唐旭辰、王迪娜

指导教师：宋丽敏、殷明

颁发机构：

颁发日期：2022 年 月 30 日

9. 首届全国大学生职业规划大赛河南省赛省级银奖，陈守辉，2024.05

首届全国大学生职业规划大赛河南省赛
银奖选手名单

序号	赛　道	组　别	选手姓名	学校名称	证书编号	指导教师
1	成长赛道	高教组	赵卜慧	郑州大学	豫教〔2024〕06143	张耀文、谷辉辉、朱峥
2			孟可馨	河南大学	豫教〔2024〕06144	王科、全冰冰、李雨蓝
3			宋鹏博	河南工业大学	豫教〔2024〕06145	冯晨晨、张小彩、刘伟杰
4			陈　冉	郑州轻工业大学	豫教〔2024〕06146	马岭、张瑞凤、石庆庆
5			唐亚旭	信阳师范大学	豫教〔2024〕06147	严赫、曲剧、孟书宇
6			董子寒	信阳师范大学	豫教〔2024〕06148	孔宪巍、郁金月、高彦伟
7			姚如意	中原工学院	豫教〔2024〕06149	刘国存、陈守辉、徐正威
8			郭文艺	郑州航空工业管理学院	豫教〔2024〕06150	李苋雷、韩忠军、李亚宁
			牛牧源	洛阳师范学院	豫教〔2024〕06151	李清爽、全宜涛、李振超
10			马晨飞	商丘师范学院	豫教〔2024〕06152	杨春凤、何学军、李坤明
11			张萱宇	商丘师范学院	豫教〔2024〕06153	王昊昊、杨贵玲、李亚南

10.第十六届河南省挑战杯大学生课外学术科技作品竞赛省级二等奖，杜艳丽、魏茜，2023.6


第十六届河南省“挑战杯”
大学生课外学术科技作品竞赛

获奖证书

中原工学院 相金彤、邱姝雅、王淳、陈茵、师晴、刘雨田、马庆威、崔云涵

的作品《我国集成电路产业链自主可控能力的调查与思考》

在第十六届河南省“挑战杯”大学生课外学术科技作品竞赛中荣获

二等奖

指导教师：田朝辉、杜艳丽、魏茜

特颁此证，以资鼓励。

（二）学生发表论文

1. 高可心， 3D nanocrystalline metal–organic framework materials for the improved output performance of triboelectric nanogenerators ， ROYAL SOCIETY OF CHEMISTRY

Dalton Transactions

ROYAL SOCIETY OF CHEMISTRY

PAPER

View Article Online
View Journal | View Issue

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3D nanocrystalline metal–organic framework materials for the improved output performance of triboelectric nanogenerators†

Kexin Gao,‡[a] Junshuai Chen,‡[a] Mengting Zhao,[a] Rentang Hu,[a] Shiheng Chen,[a] Xiaojing Xue,[b] Zhichao Shao*[a] and Hongwei Hou *[b]

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rsc.li/dalton

Triboelectric nanogenerators (TENGs) based on contact electrification and electrostatic induction can effectively convert low-frequency mechanical energy into electrical energy and has attracted considerable attention. However, the low current output performance seriously hinders the wide application of TENGs. Herein, a 3D nanocrystalline metal–organic framework (Cd-MOF) with a specific structure and morphology was reasonably designed as a high-performance triboelectric positive electrode material. The triboelectric test results showed that the maximum instantaneous short-circuit current of Cd-MT was 55.32 μA and the stable output performance maintained a long-term continuous operation for 10 000 s. The peak values of the charge density and electric power density were 102.39 μC m^{-2} and 2451.04 mW m^{-2}, respectively. In addition, the Cd-MT could quickly fully charge commercial capacitors and light a large number of LED lamps. This work provides a new idea for the development and design of functional MOF triboelectric materials.

1. Introduction

In recent years, triboelectric nanogenerators (TENGs) have received considerable attention because they can reduce the energy loss of sensors and wearable power supplies, promoting the rapid development of self-powered devices.[1–4] Compared with the traditional external fixed energy devices, TENGs with lightweight and easily manufacturable characteristics based on contact electrification and electrostatic induction can effectively convert low-frequency mechanical energy (human movement, wind, and raindrops) in the environment into electrical energy.[5–10] However, their low output power density seriously hinders the wide application of TENGs. In order to pursue a high output performance, researchers have explored various methods, including the manufacturing of surface microstructure composites and surface functionalization.[11–13] Among these, the characteristics of the charge-induced effects (surface properties) of triboelectric materials determines the output performance of TENGs. In particular, nanotriboelectric material particles obtained by special methods could not only change the surface properties but also effectively increase the contact area, which improved the output power and achieved excellent performance.[14–17] In addition, the dominant polymers in the triboelectric material series are difficult to functionalize and modify to meet more complex application needs. Developing appropriate nanomaterials is the most effective way to fundamentally improve the TENG performance.

Metal–organic frameworks (MOFs) as organic–inorganic hybrid materials containing metal nodes and organic connectors represent an ideal kind of nanoporous crystal material. Their high specific surface area, high porosity, and uniform crystallinity are attractive characteristics that make MOFs to be widely applied in applications including energy storage and conversion,[18–21] gas storage and separation,[22–24] catalysis,[25–27] power batteries,[28–30] and multifunction sensors.[31–34] In particular, abundant 3D structured nanocrystalline materials show good electronic modulation properties and outstanding potential for electrochemical energy storage, which is attributed to their continuous and regular electron fast transmission channel and pore surface that can store a large number of electrons.[35–37] Therefore, some MOFs with chemical and thermal stability have been introduced into TENGs as triboelectric materials and provide excellent performances in various applications.[38–42] However, there is a lack of reason-

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† Electronic supplementary information (ESI) available: Crystallographic parameters, supplementary figures. CCDC 2213511. For ESI and crystallographic data in CIF or other electronic format see DOI: https://doi.org/10.1039/d2dt03477h

‡ These authors contributed equally to this work.

2 、吴天宇，"Zincophilic-Hydrophobic"PAN/PMMA Nanofiber Membrane Toward High-Rate Dendrite-Free Zn Anode， Advanced Fiber Materials.

Advanced Fiber Materials
https://doi.org/10.1007/s42765-023-00323-2

RESEARCH ARTICLE

"Zincophilic-Hydrophobic" PAN/PMMA Nanofiber Membrane Toward High-Rate Dendrite-Free Zn Anode

Yanjie Wang[1] · Ning Li[1] · Huiyan Liu[1] · Juan Shi[1] · Yuequn Li[1] · Xukai Wu[1] · Zhuo Wang[1] · Chao Huang[1] · Kongyao Chen[1] · Dianbo Zhang[1] · Tianyu Wu[1] · Ping Li[1] · Cuixia Liu[2] · Liwei Mi[1]

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Abstract

Uncontrollable Zn dendrites and side reactions seriously downgrade the cycling stability of the Zn anode, and restrict the commercialization of aqueous zinc ion batteries. Here, PAN-based (PAN, PAN/PMMA) nanofiber membranes with uniform "zincophilic-hydrophobic" sites have been in-situ electrospun on Zn to effectively prevent harmful side reactions and control Zn plating/stripping behavior. The abundant highly-negative functional groups (C≡N and C=O) of PAN/PMMA have strong coordination interactions with Zn^{2+}, which can accelerate Zn^{2+} desolvation and increase the Zn^{2+} migration number. Furthermore, the even distribution of zincophilic sites can help create a uniform Zn deposition environment and enable horizontal Zn deposition. Simultaneously, the inherent "hydrophobicity" of the nonpolar carbon skeleton in PAN/PMMA can prevent Zn corrosion and hydrogen evolution reaction (HER) side reactions, thus improving the cycling stability of the Zn anode. As a result, PAN/PMMA@Zn symmetric cells demonstrated remarkable rate performance and long cycling stability, sustaining efficient operation for over 2000 cycles at 10 mA cm^{-2} with a low polarization voltage below 65 mV. This Zn anode modification strategy by in-situ constructed PAN-based nanofiber membrane has the advantages of simple-preparation, one-step membrane construction, binder-free, uniform distribution of functionalized units, which not only provides a specific scheme for developing advanced Zn anode but also lays a certain research foundation for developing "separator-anode" integrated Zn-based batteries.

Keywords Zincophilic-hydrophobic · Electrospun nanofiber membrane · PAN/PMMA · Dendrite-free Zn anode · High-rate performance

Introduction

Aqueous Zn-ion batteries (AZIBs) are among the most important next-generation batteries for electrochemical energy storage systems [1]. Zn has emerged as one of the most commercially available anode materials for AZIBs, owing to its high theoretical specific capacity, low redox potential, safety and non-toxicity. However, uncontrollable Zn dendrites formation and unavoidable side reactions (hydrogen evolution reaction (HER) [2], by-product aggregation, Zn corrosion) during the electrochemical process significantly downgrade the cycling stability of the Zn anode, thus resulting in the premature failure of AZIBs. Specifically, side reactions such as Zn corrosion and the HER caused by the thermodynamic instability of the Zn metal in aqueous electrolytes lead to the low Coulombic efficiency of the Zn anode [3]. In addition, the presence of uneven environmental factors, such as chemical, physical, and electrochemical, on pure Zn anode results in non-uniform Zn nucleation sites on the electrode surface, namely "tip effect" of Zn anode [4]. Subsequently, Zn^{2+} continues to grow along the inhomogeneous nucleation sites with lower surface energies, resulting in erect Zn dendrites. These erect

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Springer

（三）学生专利

1．高可心，基于Cu-MOF的摩擦纳米发电材料及其制备方法和应用

证书号第6024060号

发明专利证书

发 明 名 称：基于Cu-MOF的摩擦纳米发电材料及其制备方法和应用

发 明 人：邵志超;陈军帅;高可心;何淑雅;米立伟

专 利 号：ZL 2022 1 0800104.5

专利申请日：2022年07月06日

专 利 权 人：中原工学院

地 址：451191 河南省郑州市新郑双湖经济技术开发区淮河路1号

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2.吴天宇，一种MOF-808/PAN@Zn金属负极及其制备方法和应用

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发明人：王艳杰,吴旭凯,李宁,刘慧岩,李越雨,朱立伟,吴天宇,刘静,刘翠霞,吴学领

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（四）学生团队获奖

1、2023年全省高校“十佳学生社团”，ONEBYONE大学生成长中心

附　件

2023年全省高校“十佳学生社团”评选结果

（排名不分先后）

一、思想政治类		
序号	社团名称	所在学校
1	马克思主义研究会	河南大学
2	青年马克思主义学习研究会	郑州轻工业大学
3	“小石榴”民族团结进步宣讲团	郑州航空工业管理学院
4	青年马克思主义学习社	洛阳师范学院
5	马克思主义研习社	商丘师范学院

10	无人机社团	河南机电职业学院
三、创新创业类		
序号	社团名称	所在学校
1	创客协会	河南科技大学
2	学生BIM协会	河南财经政法大学
3	漫动作动漫社	信阳师范大学
4	ONEBYONE大学生成长中心	中原工学院
5	警用无人机创新实践社团	河南警察学院
6	智行团队	郑州西亚斯学院
7	机械兵团创业者协会	黄河水利职业技术学院
8	新时代青年农场主	河南农业职业学院