陕西师范大学 SHAANXI NORMAL UNIVERSITY

西安交通大学 XIAN JIAOTONG UNIVERSITY

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简报
Newsletter

新概念传感器与分子材料研究院
Institute of New Concept Sensors and Molecular Materials

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彭浩南教授参加化学类虚拟教研室协作组第二次会议并作报告

Peng Haonan presents at Second Meeting of Chemistry Virtual Teaching and Research Office Collaboration Group

2026 年 8 月 2 日至 6 日，陕西师范大学新概念传感器与分子材料研究院彭浩南教授在甘肃省张掖市参加“中西部高校化学实验教学规范化高阶性建设研讨会暨化学类虚拟教研室协作组第二次会议”，并作题为“协同育人体系构建——从课程重构到学生成长画像”的报告。

From August 2 to 6, 2026, Prof. Peng Haonan of the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University attended the Seminar on Standardized and Advanced Development of Chemistry Experiment Instruction in Central and Western Chinese Universities and the Second Meeting of the Collaborative Group of Chemistry Virtual Teaching and Research Offices in Zhangye, Gansu province, where he presented a report titled

“Building a Collaborative Education System: From Curriculum Restructuring to Student Growth Profiles”.

薄鑫副研究员访问光华科技股份有限公司并作报告

Bo Xin visits and presents at GHTECH

2026 年 8 月 5 日至 7 日，陕西师范大学新概念传感器与分子材料研究院薄鑫副研究员受邀赴广州光华科技股份有限公司参观访问，并作题为“电化学表界面调控策略在高端化学品绿色制造产业中的应用”的报告。

From August 5 to 7, 2026, Assoc. Prof. Bo Xin from the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University visited Guangzhou Guanghua Technology Co., Ltd. (GHTECH), where he presented a report titled “Electrochemical Surface Interface Regulation Strategies in the Application on Green Manufacturing Industry of High-Value Chemicals”.

丁立平教授获批陕西省自然科学基础研究计划项目青年 A 类项目

Ding Liping awarded Category A Youth Grant under Shaanxi Provincial Natural Science Basic Research Program

近日，陕西省科技厅公布了 2026 年度陕西省科技计划项目资助结果，新概念传感器与分子材料研究院丁立平教授获批自然科学基础研究计划项目青年 A 类项目。

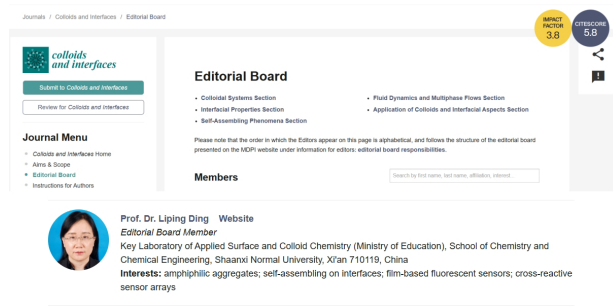
Recently, Prof. Ding Liping of the Institute of New Concept Sensors and Molecular Materials was awarded a Category A Youth Grant under the Basic Research Program in Natural Sciences, as Shaanxi Provincial Department of Science and Technology announced its funding results for the 2026 Shaanxi Provincial Science and Technology Program.

丁立平教授受邀担任 Colloids and Interfaces 期刊编委

Ding Liping to serve on editorial board of Colloids and Interfaces

近日，新概念传感器与分子材料研究院丁立平教授受邀担任 Colloids and Interfaces 期刊编委。

Colloids and Interfaces（ISSN2504–5377）为双月刊，是一本由 MDPI 在线出版的国际同行评审开放获取期刊，聚焦胶体与界面化学领域，刊载胶体与界面化学全部研究方向的成果。



Recently, Prof. Ding Liping of the Institute of New Concept Sensors and Molecular Materials was invited to serve on the editorial board of the journal Colloids and Interfaces.

Colloids and Interfaces (ISSN 2504-5377) is a bimonthly journal published online by MDPI. It is an international, peer-reviewed, open-access journal focused on the field of colloid and interface chemistry, publishing research across all areas of this discipline.

房喻院士出席精细化工全国重点实验室第一届学术委员会暨学术指导委员会第二次会议

Fang Yu attends second meeting of First Academic Committee of State Key Laboratory of Fine Chemicals

2026 年 8 月 19 日，房喻院士应邀出席大连理工大学精细化工全国重点实验室第一届学术委员会暨学术指导委员会第二次会议，与大连理工大学校长、中国工程院院士高翔、重点实验室学术委员会副主任丁奎岭院士、顾问委员会名誉主任佟振合院士、战略咨询委员会委员包信和院士等院士及行业专家学者一起为实验室高质量建设把脉定向、建言献策。

On August 19, 2026, Prof. Fang Yu was invited to attend the second meeting of the First Academic Committee and the Academic Advisory Committee of the State Key Laboratory of Fine Chemicals at Dalian University of Technology.

Together with DLUT president and Chinese Academy of Engineering Academician Gao Xiang, Academician Ding Kuiling (deputy director of the Key Laboratory's Academic Committee), Academician Tong Zhenhe (honorary director of the Advisory Committee), Academician Bao Xinhe (member of the Strategic Advisory Committee), and other academicians, industry experts and scholars, they provided guidance and offered suggestions for the high-quality development of the laboratory.

研究院教师指导研究生获第七届“明石杯”微纳传感技术与智能应用赛决赛二等奖

INCSMM teachers and graduate students win second prize in 7th Bright Stone Cup Micro-Nano Sensing Technology and Intelligent Applications Competition

近日，在山东烟台举办的 2026 年中国大学生机械工程创新创意大赛第七届“明石杯”微纳传感技术与智能应用赛决赛上，由彭浩南教授、罗艳彦老师担任指导教师，研究生李慧思、吕乐怡、陈周玉、李欣佩、周佰妍为成员的参赛队凭“一芯双境：面向气液双域的二氧化氯高性能传感技术”获得了二等奖。

Recently, at the finals of 7th "Bright Stone Cup" Micro-Nano Sensing Technology and Intelligent Applications Competition of the 2026 China College Student Mechanical Engineering Innovation and Creativity Competition held in Yantai, Shandong province, a team led by Prof. Peng Haonan and R&D engineer Luo Yanyan — comprising graduate students Li Huisi, Lyu Leyi, Chen Zhouyu, Li Xinpei, and Zhou Baiyan — won the Second Prize for their project "One Chip, Two Environments: High-Performance Chlorine Dioxide Sensing Technology for Gas-Liquid Dual Domains".

薄鑫副研究员参加第五届高端制造电子电镀论坛并作邀请报告

Bo Xin presents an invited report at 5th China Forum of Electronic Plating for Advanced Manufacturing

2026 年 8 月 21 日至 23 日，陕西师范大学新概念传感器与分子材料研究院薄鑫副研究员参加了在厦门举办的第五届高端制造电子电镀论坛，并作了题为"电化学表界面调控策略在高端电沉积制造中的应用"的邀请报告。

From August 21 to 23, 2026, Assoc. Prof. Bo Xin from the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University attended the 5th China Forum of Electronic Plating for Advanced Manufacturing held in Xiamen and presented an invited report titled "Electrochemical Interface Regulation Strategies in the Application of High-Value Chemicals Manufacturing".

房喻院士应邀出席"明石杯"微纳传感技术与智能应用赛总决赛启动仪式

Fang Yu attends Launch Ceremony of Bright Stone Cup Micro-Nano Sensing Technology and Intelligent Applications Competition

2026 年 8 月 22 日，房喻院士应邀赴烟台黄渤海新区出席 2026 年中国大学生机械工程创新创意大赛："明石杯"微纳传感技术与智能应用赛总决赛启动仪式。

On August 22, 2026, Prof. Fang Yu was invited to Yantai's Huangbohai New Area to attend the launch ceremony for the finals of the 2026 China College Students' Mechanical Engineering Innovation and Creativity Competition: the "Bright Stone Cup" Micro-Nano Sensing Technology and Intelligent Applications Competition.

2026 化学传感器与功能分子材料产学研用研讨会举办

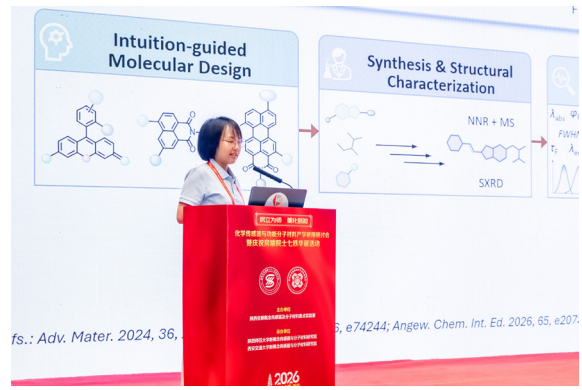
2026 Symposium on Chemical Sensors and Functional Molecular Materials: Industry-Academia-Research-Application Collaboration held

2026 年 8 月 23 日至 25 日，由陕西省新概念传感器及分子材料重点实验室主办，陕西师范大学新概念传感器与分子材料研究院和西安交通大学新概念传感器与分子材料研究院共同承办的化学传感器与功能分子材料产学研用研讨会在西安举办。来自全国各地、不同行业的 150 余位代表参加了此次会议。

8 月 24 日，来自全国各地的参会代表参加了开幕式，会议由丁立平教授主持并致辞。在报告会环节，陕西师范大学刘生忠教授做了题为《钙钛矿光电器件的表界面化学》的学术报告，宁夏惠亿生物科技有限公司申月华总经理做了《勤学立身、知行合一》的创业交流报告，维泰瑞隆生物技术有限公司刘连柱药物化学执行总监做了题为《从师大出发》的产业报告。德国乌尔姆大学常兴茂博士后研究员、西安交通大学前沿科学与技术研究院张金江教授和张伟特聘研究员、中国科学院大连化学物理研究所王朝龙特别研究助理、以及南洋理工大学黄蓉蓉博士后分别做了学术报告。报告部分分别由丁立平教授、刘静教授和彭军霞教授主持。

在会议总结环节，房喻教授以《从乡村学校到学术殿堂，我的千万个“没想到”》为题，结合自身数十年跌宕而丰厚的人生历程和丰富阅历，与在场代表深度分享了对“在关键的人生节点做正确的选择”“办法总比困难多”以及“何为幸福人生真谛”等命题的切身感悟。言语间既有百转千回的回望，亦有豁然开朗的洞见。房老师殷切勉励各位代表，既要在修身立业上笃行不怠，也要在日常中常怀善意、积极向上，努力活成一束光，既温暖自己，也照亮身边同行之人。整场总结既具思想深度，又饱含人文温度，为大会画上了充满力量与启发的句点。

本次研讨会紧扣国家新材料、生态环境与健康监测等战略发展需求，聚焦化学传感器、功能分子材料领域前沿发展方向，汇聚学术界、产业界及科研院所的专家学者与行业从业者，共同研讨化学传感器与功能分子材料的基础研究、技术攻关及产业化应用最新进展，助力领域技术创新与产业链协同升级。



From August 23 to 25, 2026, the Symposium on Chemical Sensors and Functional Molecular Materials: Industry-Academia-Research-Application Collaboration was held in Xi'an. The event was organized by the Shaanxi Provincial Key Laboratory of New Concept Sensors and Molecular Materials and co-hosted by the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University and the Institute of New Concept Sensors and Molecular Materials at Xi'an Jiaotong University. More than 150 delegates from various regions across the country and different industries attended the conference.

On August 24, delegates attended the opening ceremony, which was presided over by Prof. Ding Liping, who also delivered opening remarks. During the presentation session, Prof. Liu Shengzhong from Shaanxi Normal University delivered a report titled "Interfacial Chemistry of Perovskite Optoelectronic Devices"; Shen Yuehua, general manager of Ningxia Huiyi Biotechnology Co., Ltd., gave an entrepreneurial talk titled "Diligent Study as the Foundation of One's Life: The Unity of Knowledge and Action"; and Liu Lianzhu, executive director of medicinal chemistry at Sironax Biotechnology Co., Ltd., presented an industrial report titled "Setting Out from Shaanxi Normal University". Dr. Chang Xingmao, a postdoctoral researcher at the University of Ulm in Germany; Prof. Zhang Jinjiang and Prof. Zhang Wei from the Frontier Institute of Science and Technology at Xi'an Jiaotong University; Dr. Wang Chaolong, Special Research Assistant at the Dalian Institute of Chemical Physics, Chinese Academy of Sciences; and Dr. Huang Rongrong, a postdoctoral researcher at Nanyang Technological University, each presented reports. The presentation sessions were chaired by Professors Ding Liping, Liu Jing, and Peng Junxia, respectively.

During the closing session, Prof. Fang Yu delivered a speech titled "From Rural Schools to the Halls of Academia: My Thousands of 'I Never Expected This' Moments". Drawing on his own decades-long, eventful, and enriching life journey and vast experience, he shared with the delegates his personal insights on topics such as "making the right choices at critical junctures in life", "solutions always outnumber difficulties", and "the true essence of a happy life". His words were interwoven with both a winding retrospective and moments of sudden clarity. Prof. Fang earnestly encouraged the delegates to persevere in self-cultivation and professional development, while also maintaining a spirit of kindness and positivity in their daily lives, striving to become a beacon of light that warms themselves and illuminates those around them. The entire summary was both

intellectually profound and imbued with human warmth, bringing the conference to a powerful and inspiring close.

This symposium closely aligns with national strategic development needs in areas such as new materials, ecological environment, and health monitoring. It focuses on cutting-edge developments in the fields of chemical sensors and functional molecular materials, bringing together experts, scholars, and industry professionals from academia, industry, and research institutions to jointly discuss the latest advances in basic research, technological breakthroughs, and industrial applications of chemical sensors and functional molecular materials, thereby promoting technological innovation and the coordinated upgrading of the industrial chain in these fields.

房喻院士获聘新材料陕西实验室第一届学术委员会委员

Fang Yu appointed to the First Academic Committee of Shaanxi Laboratory for New Materials

2026 年 8 月 28 日上午，房喻院士应邀出席新材料陕西实验室第一届学术委员会第一次全体会议，并在会上获聘新材料陕西实验室第一届学术委员会委员。

On August 28, 2026, Prof. Fang Yu was invited to attend the first plenary meeting of the first Academic Committee of the Shaanxi Laboratory for New Materials, where he was appointed as a member of the first Academic Committee.

研究亮点 Research Highlight

PRECISION CHEMISTRY

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Article

Isostructural fcu Rare-Earth Metal–Organic Frameworks Based on a Zigzag Dicarboxylate Ligand: One-Step Ethylene Purification from C_2 Mixtures and Turn-On Sensing of a Nerve Agent Simulant

Published as part of Precision Chemistry special issue "Precision Chemistry for Metal–Organic Frameworks (MOFs)".

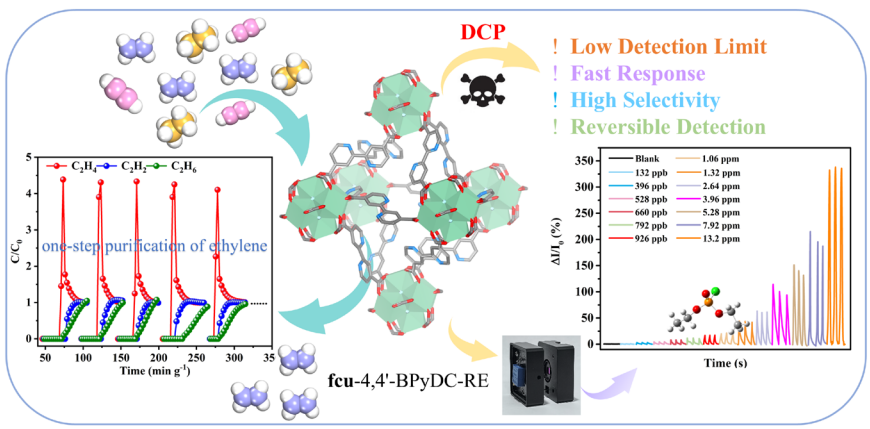
Hong-Xia Liang,[#] Wei-Hong Zhang,[#] Guo-Tong Du, Ruijuan Wen, Ya-Nan Ma, Haonan Peng, Dong-Xu Xue,[*] and Yu Fang

Cite This: https://doi.org/10.1021/prechem.6c00085

Read Online

面向 C_2 混合气中乙烯一步纯化及神经毒剂模拟物荧光开启传感的锯齿形二羧酸基 fcu 稀土金属有机框架

Hong-Xia Liang #; Wei-Hong Zhang #; Guo-Tong Du; Ruijuan Wen; Ya-Nan Ma; Haonan Peng; Dong-Xu Xue * ; Yu Fang. Precis. Chem., 2026, DOI: https://doi.org/10.1021/prechem.6c00085



乙烯作为石化工业的核心基础原料，工业裂解得到的 C_2 混合气中混有乙烷、乙炔杂质。传统分离工艺依赖深冷精馏，能耗高，从乙炔 / 乙烷 / 乙烯三元体系中一步直接获得聚合级乙烯是化工分离领域的重大挑战。与此同时，神经性毒剂属于剧毒化学战剂，对公共安全与国家安全造成严重威胁，开发快速、灵敏、可现场实时检测神经性毒剂的传感材料具有重要现实意义。荧光传感凭借响应快、便携的优势，是痕量毒剂筛查极具潜力的技术手段。针对以上问题，本工作利用锯齿型二羧酸配体 4,4′ – 联吡啶 –4,4′ – 二羧酸（4,4′ –H_2BPyDC），以 2– 氟苯甲酸作为调节剂，溶剂热条件下构筑了一系列同构 fcu 拓扑稀土金属 – 有机框架材料 fcu–4,4'–BPyDC–RE（RE = Yb、Y、Eu、Gd）。

气体分离测试表明，fcu–4,4'–BPyDC–Yb/Y 对乙炔、乙烷吸附能力显著高于乙烯，可从乙炔 – 乙烷 – 乙烯三元混合气中同时脱除乙炔与乙烷，实现乙烯一步纯化。混合气

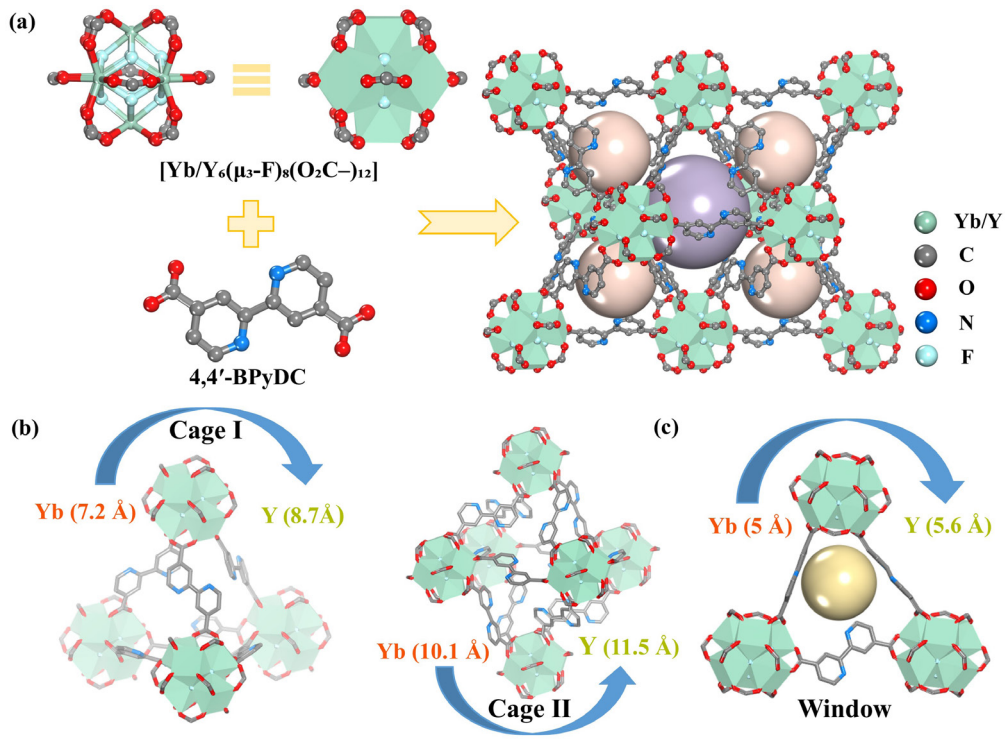


图 1. (a) fcu-4,4'-BPyDC-Yb/Y 的结构组装与孔道构筑；(b)(c) 两种笼腔与三角形窗口孔径尺寸

Figure 1. Structural assembly and pore architecture of fcu-4,4'-BPyDC-Yb/Y (a) Schematic illustration for the assembly of inorganic Y/Yb cluster nodes and organic 4,4'-BPyDC ligands, (b) Pore sizes of the two types of cages in fcu4,4'-BPyDC-Yb/Y, (c) Sizes of the corresponding triangular windows.

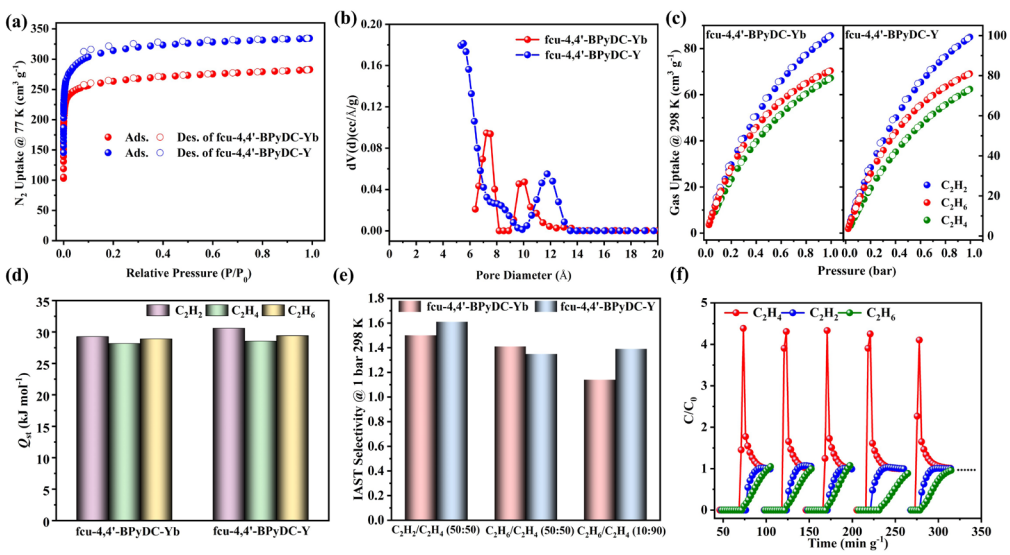


图 2. fcu-4,4'-BPyDC-Yb/Y 的氮气吸附、C_2 烃吸附、IAST 选择性及混合气穿透测试结果寸

Figure 2. fcu-4,4'-BPyDC-Yb/Y: (a) N_2 sorption isotherms at 77 K; (b) pore size distribution; (c) C_2 gas sorption isotherms at 298 K; (d) Q_{st} of C_2 gases; (e) IAST selectivity for C_2H_2/C_2H_4 (50/50, v/v) and C_2H_6/C_2H_4 (50/50, 10/90, v/v) at 298 K and 1 bar; and (f) five cyclic breakthrough test curves for $C_2H_2/C_2H_6/C_2H_4$ (1:1:1) mixture.

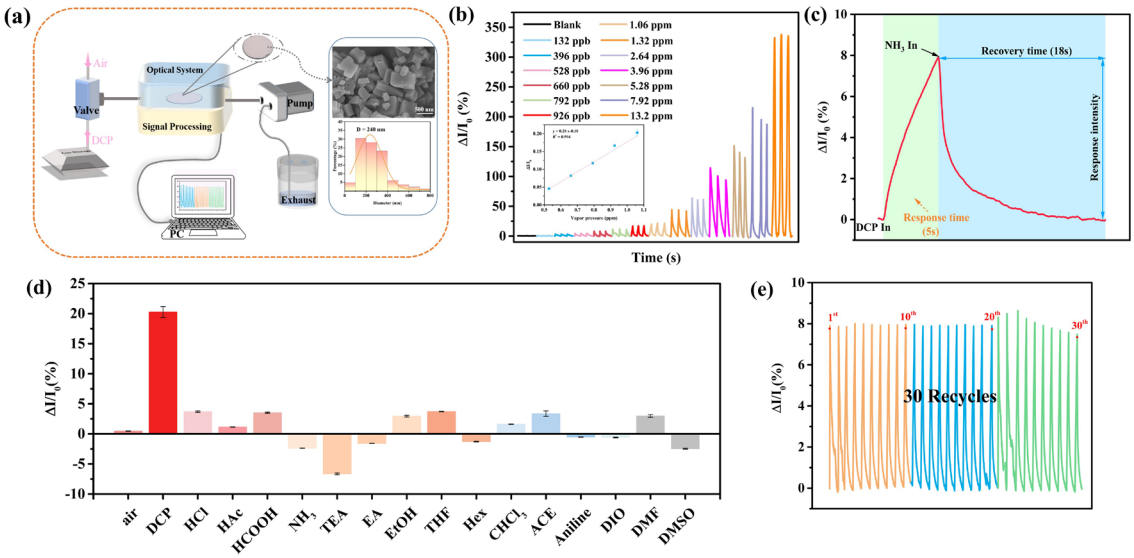


图 3. fcu-4,4'-BPyDC-Eu 薄膜对 DCP 蒸气的气相传感性能

Figure 3. (a) Schematic diagram of the sensing system. (b) Sensor response intensities at various DCP concentrations, showing a linear relationship from 0.5 to 1.1 ppm (n = 5). (c) Kinetic response curve of the film to DCP vapor. (d) Selectivity testing experiments of the film for DCP vapors containing 15 interferents were performed. (e) Reproducibility of film for DCP detection.

体穿透实验、IAST 选择性计算以及巨正则蒙特卡洛（GCMC）模拟证实该材料的分离性能，材料吸附焓适中，可实现温和条件下再生，经过多次循环仍保持稳定分离效果。在传感方面，fcu–4,4'–BPyDC–Eu 对神经毒剂模拟物氯磷酸二乙酯 (DCP) 表现出荧光开启响应；基于该材料制备的气相传感薄膜，响应时间仅 5 s，气相检测限低至 3.2 ppb，兼具高选择性与可逆循环使用能力。结合 PXRD、FT–IR、XPS、核磁以及轧基同构 MOF 的磷光谱学表征证实传感机制：DCP 促使配体上吡啶氮发生质子化，调变配体三线态能级，优化配体与 Eu^{3+} 之间天线效应的能级匹配，抑制非辐射跃迁，最终产生荧光开启信号。

总之，该工作成功实现了基于锯齿型二羧酸配体的 fcu 型稀土 MOF 平台构建，将轻烃高效分离与高灵敏荧光毒剂检测集成于同一类异质同构材料体系，为多功能稀土 MOF 的结构设计与应用开发提供了新思路。

第一作者：陕西师范大学硕士研究生梁红霞、张伟宏
通讯作者：陕西师范大学薛东旭教授
全文链接：https://doi.org/10.1021/prechem.6c00085

As a core fundamental feedstock in the petrochemical industry, the C_2 mixed gas obtained from industrial steam cracking contains acetylene and ethane impurities alongside ethylene. Conventional separation processes rely on cryogenic distillation, which incurs high energy consumption. Achieving one-step direct production of polymer-grade ethylene from the ternary acetylene/ethane/ethylene mixture represents a major challenge in chemical separation. Meanwhile, nerve agents are highly toxic chemical warfare agents that pose severe threats to both public and national security. Developing sensing materials capable of rapid, sensitive, and on-site real-time detection of nerve agents is of significant practical importance. Fluorescence sensing, owing to its fast response and portability, is a promising technique for trace-level toxin screening. To address these issues, this work employs the zigzag dicarboxylate ligand 4,4′-bipyridine-4,4′-dicarboxylic acid (4,4′-H_2BPyDC) and uses 2-fluorobenzoic acid as a modulator to construct a series of isostructural rare-earth metal–organic frameworks with fcu topology under solvothermal conditions.

Gas separation tests show that fcu-4,4′-BPyDC-Yb/Y exhibit significantly higher adsorption capacities for acetylene and ethane than for ethylene, enabling the simultaneous removal of acetylene and ethane from the ternary $C_2H_2/C_2H_6/C_2H_4$ mixture and thus achieving one-step ethylene purification. Mixed-gas breakthrough experiments, ideal adsorbed solution

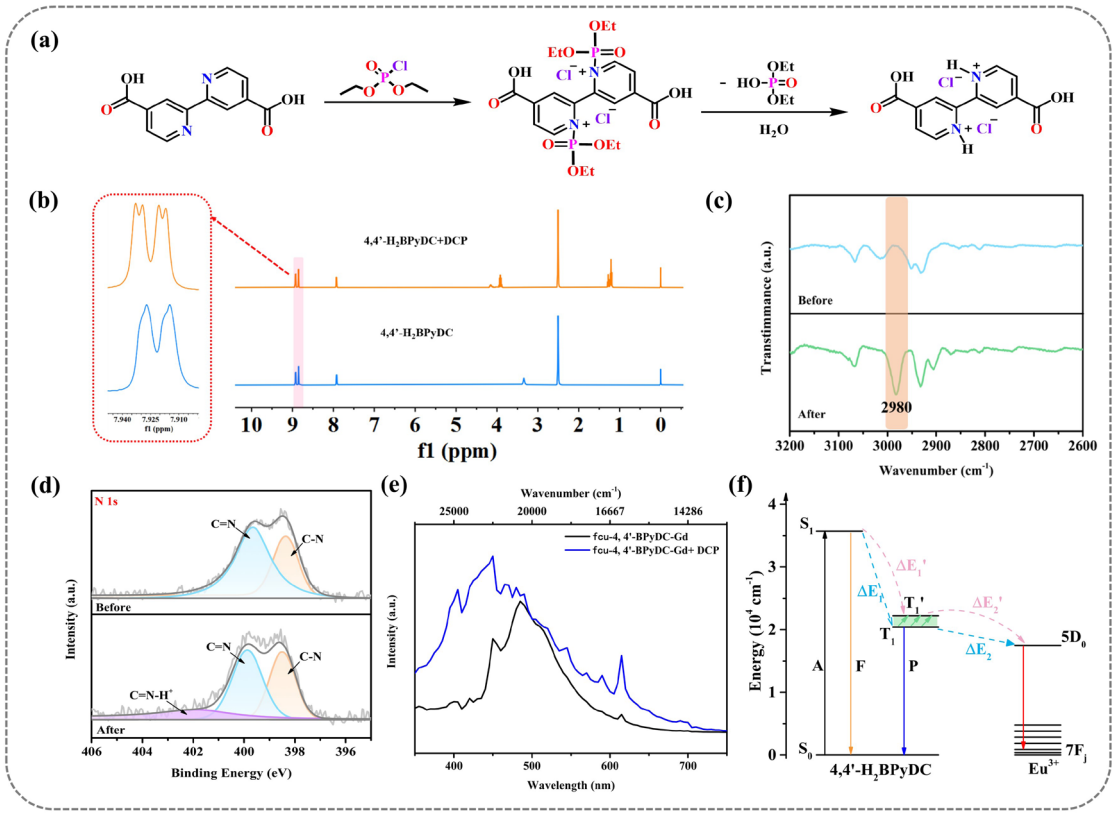


图 4. fcu-4,4'-BPyDC-Eu 薄膜对 DCP 蒸气的传感机理解析

Figure 4. (a) Proposed mechanism of binding of 4,4'-H2BPyDC to DCP. (b) ^{1}H NMR spectra of 4,4'-H_2BPyDC in the absence/presence of DCP. (c) FT-IR spectra of the fcu-4,4'-BPyDC-Eu before and after DCP treatment. (d) N 1s XPS spectrum of fcu-4,4'-BPyDC-Eu before and after DCP treatment. (e) Low-temperature phosphorescence spectrum of fcu-4,4'-BPyDC-Gd before and after DCP treatment. (f) Schematic representation of the energy levels of 4,4'-H_2BPyDC and Eu(Ⅲ).

theory (IAST) selectivity calculations, and grand canonical Monte Carlo (GCMC) simulations corroborate the separation performance. The materials feature moderate adsorption enthalpies, allowing regeneration under mild conditions, and retain stable separation efficiency after multiple cycles. In terms of sensing, fcu-4,4′-BPyDC-Eu exhibits a fluorescence turn-on response toward diethyl chlorophosphate (DCP), a simulant of nerve agents. A gas-phase sensing film fabricated from this material shows a response time of merely 5 s and a gas-phase detection limit as low as 3.2 ppb, together with high selectivity and reversible recyclability. Combined characterization by PXRD, FT-IR, XPS, NMR, and phosphorus spectroscopy on the gadolinium-based isostructural MOF elucidates the sensing mechanism: DCP induces protonation of the pyridyl nitrogen atoms on the ligand, which modulates the triplet-state energy level of the ligand, optimizes the energy-level matching for antenna effect toward Eu^{3+}, and suppresses non-radiative transitions, ultimately producing the fluorescence turn-on signal.

In summary, this work successfully establishes a platform of fcu-type rare-earth MOFs based on a zigzag dicarboxylate ligand, integrating efficient light-hydrocarbon separation and highly sensitive fluorescent toxin detection within a single isoreticular material platform. This provides new insights into the structural design and application development of multifunctional rare-earth MOFs.

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Article

Morphology-Regulated PET-Mediated Quenching in a Pyrene-*o*-carborane AIEgen Film for Rapid Aniline Vapor Sensing

Published as part of The Journal of Physical Chemistry C special issue "Yu Fang Festschrift".

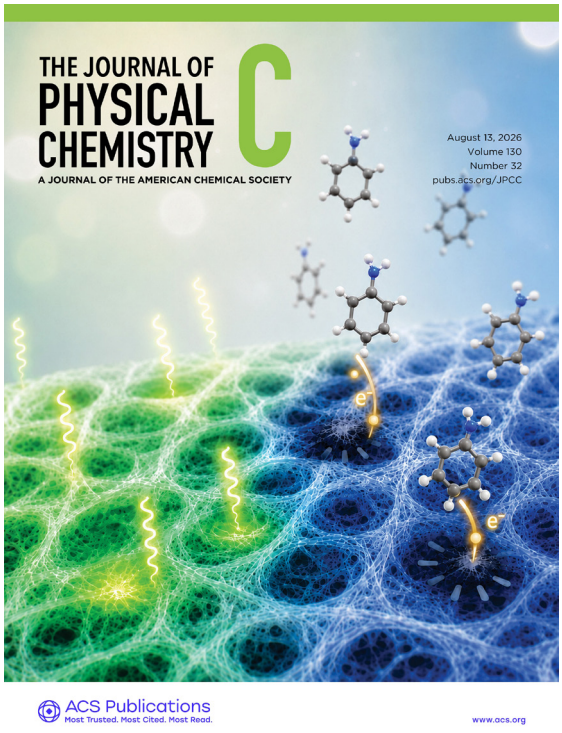
Run Li, Pan Liu, Xinyao Mao, Jia Zhang, Ya Zou, Yuxin Xue, Helan Zhang, Ruijuan Wen, Liping Ding, Haonan Peng,* and Yu Fang

Cite This: https://doi.org/10.1021/acs.jpcc.6c04279 Read Online

通过形貌调控芘 – 邻碳硼烷 AIEgen 薄膜中的 PET 效率，实现快速苯胺蒸气传感

Run Li, Pan Liu, Xinyao Mao, Jia Zhang, Ya Zou, Yuxin Xue, Helan Zhang, Ruijuan Wen, Liping Ding, Haonan Peng*, and Yu Fang. J. Phys. Chem. C 2026, 130 (32), 11321-11330. DOI: 10.1021/acs.jpcc.6c04279

⋆ 该论文被收录于“庆祝房喻教授七秩华诞论文集”。
该研究成果入选《The Journal of Physical Chemistry C》内封面展示。
*Published as part of *The Journal of Physical Chemistry C* special issue "*Yu Fang Festschrift*".
This research was selected for the inside front cover of *The Journal of Physical Chemistry C*.



苯胺是一种重要的挥发性芳香胺，广泛应用于染料、医药和精细化工等领域。然而，苯胺具有一定毒性，并可能带来职业与环境暴露风险，因此，开发快速、便携、可视化的苯胺蒸气检测方法具有重要意义。荧光薄膜传感器具有响应快、光学信号直观和易于集成等优势，在挥发性有机物（VOCs）的快速检测与现场监测方面展现出良好的应用前景。

光诱导电子转移（photoinduced electron transfer，PET）是荧光传感体系中常见的响应机制。传统 PET 型荧光传感材料的分子设计通常侧重于调控荧光团与分析物之间的能级匹配，以促进电子转移。然而，对于固态荧光薄膜，传感性能不仅取决于能级匹配，还受到分子聚集行为、薄膜微观结构以及分析物向发光位点扩散和接近能力的显著影响。因此，仅优化能级关系往往难以兼顾高效固态发光与快速 PET 响应。如何在保持优异聚集诱导发光（aggregation–induced emission，AIE）性能的同时，构建分析物易于接近的 PET 猝灭通道，是开发高性能固态荧光传感材料面临的重要挑战。

针对这一问题，研究团队设计并合成了含邻碳硼烷（o–carborane）的芘基 AIE 发光体 2CB–Py–2Ph。该分子以共轭芘骨架为高效发光核心，并通过三维邻碳硼烷单元调控分子构型、激发态电子性质及固态聚集行为，从而抑制平面 π 共轭体

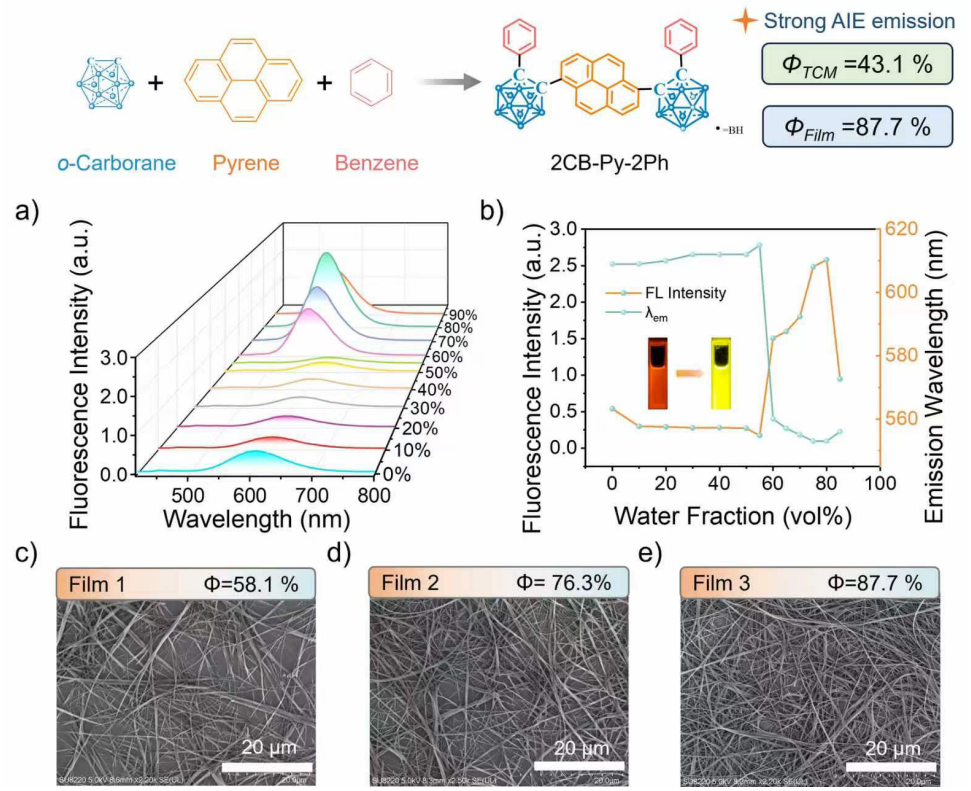


图 1. 2CB-Py-2Ph 的分子设计、聚集诱导发光行为与薄膜形貌调控。

Figure 1. Molecular design, aggregation-induced emission behavior, and film-morphology regulation of 2CB-Py-2Ph.

系中常见的过度堆积，实现固态发光与传感性能的协同调节。研究结果显示，2CB–Py–2Ph 本征固体粉末的荧光量子产率高达 98.7%，表明其具有优异的固态发光能力。

研究团队进一步通过改变成膜浓度调控薄膜表面微观结构，并系统考察薄膜形貌对发光和传感性能的影响。结果表明，致密薄膜虽具有更高的荧光量子产率，但相对疏松的薄膜可提供更通畅、可接近性更高的分析物扩散通道，促进苯胺分子与发光位点相互作用，从而增强 PET 介导的猝灭响应。优化后的薄膜可在 900 ppt 至 900 ppm 的浓度范围内检测苯胺蒸气，荧光在 5 s 内发生猝灭；去除苯胺蒸气后，薄膜可在 35 s 内恢复至初始荧光强度的 90%，并表现出良好的循环稳定性。荧光寿命测试、密度泛函理论（DFT）计算和飞秒瞬态吸收（fs–TA）光谱共同支持动态猝灭的贡献，并与 PET 介导的响应路径相一致。

该研究提出了“分子结构调控—聚集形貌调节—分析物可接近性与 PET 响应协同优化”的设计思路，揭示了薄膜聚集形貌在平衡固态发光效率与 PET 猝灭性能中的关键作用，为构筑兼具高亮度、宽检测范围、快速响应和良好可逆性的荧光蒸气传感薄膜提供了新的策略。

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全文链接：https://doi.org/10.1021/acs.jpcc.6c04279

Aniline is an important volatile aromatic amine widely used in the dye, pharmaceutical, and fine-chemical industries. However, its toxicity and potential occupational and environmental exposure risks create a need for rapid, portable, and visual detection of aniline vapor. Fluorescent-film sensors offer fast responses, intuitive optical readouts, and ease of integration, making them promising platforms for the rapid detection and on-site monitoring of volatile organic compounds (VOCs).

Photoinduced electron transfer (PET) is a common response mechanism in fluorescent sensing systems. Conventional molecular-design strategies for PET-based sensors generally focus on tuning the energy-level alignment between a fluorophore and an analyte to facilitate electron transfer. In solid-state fluorescent films, however, sensing performance depends not only on energetic matching but also on molecular aggregation, film microstructure, and the diffusion and accessibility of analyte molecules to emissive sites. Optimizing energy levels alone is therefore often insufficient to achieve both efficient solid-state emission and a rapid PET response.

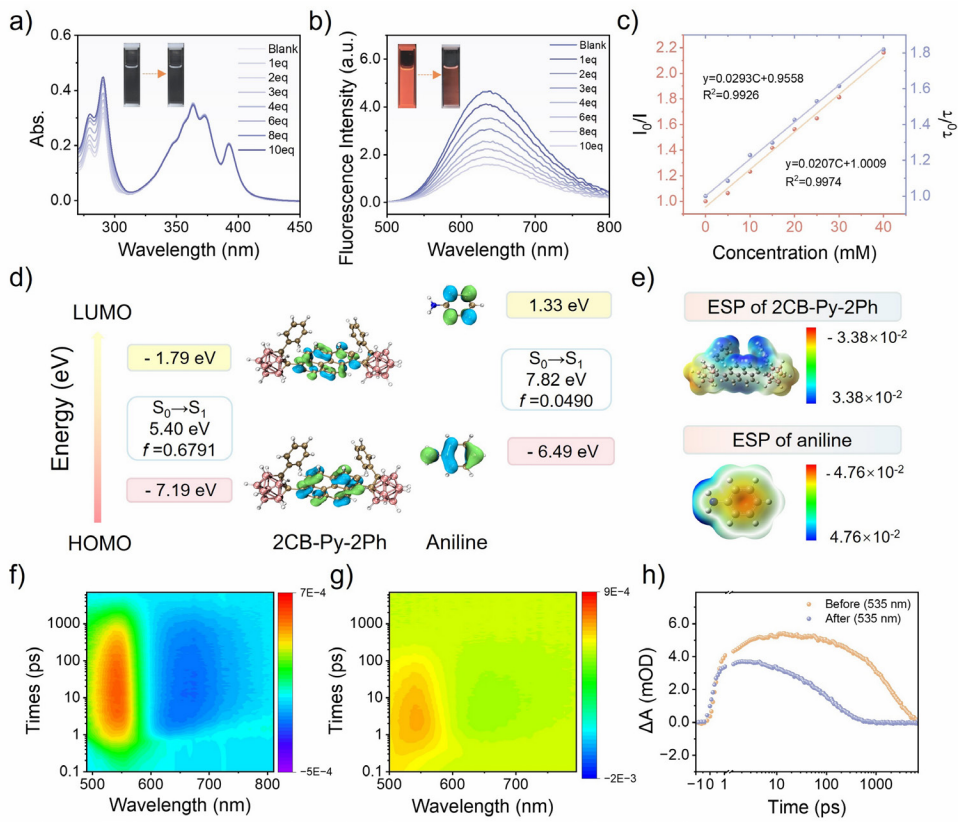

图 2. 2CB-Py-2Ph 薄膜对苯胺蒸气的响应及其 PET 介导的荧光猝灭机制。

Figure 2. Response of the 2CB-Py-2Ph film to aniline vapor and the PET-mediated fluorescence-quenching mechanism.

A central challenge is to preserve strong aggregation-induced emission (AIE) while creating PET-quenching pathways that remain readily accessible to the analyte.

To address this challenge, the research team designed and synthesized 2CB-Py-2Ph, an o-carborane-containing pyrene-based AIE luminogen. Its conjugated pyrene framework serves as an efficient emissive core, while the three-dimensional o-carborane units modulate molecular geometry, excited-state electronic properties, and solid-state aggregation. This design suppresses the excessive packing commonly encountered in planar π-conjugated systems and enables the solid-state emission and sensing performance to be tuned synergistically. The pristine solid powder of 2CB-Py-2Ph exhibited a fluorescence quantum yield of 98.7%, demonstrating its strong intrinsic solid-state emission.

The team then varied the film-forming concentration to regulate the surface microstructure and systematically evaluated how film morphology affected emission and sensing. Although compact films showed higher fluorescence quantum yields, relatively loose films provided more open and accessible diffusion pathways, facilitating interactions between aniline molecules and emissive sites and thereby strengthening the PET-mediated quenching response. The optimized film detected aniline vapor across a concentration range of 900 ppt to 900 ppm, with fluorescence quenching occurring within 5 s. After removal of the aniline vapor, the fluorescence recovered to 90% of its initial intensity within 35 s, and the film displayed good cycling stability. Fluorescence-lifetime measurements, density functional theory (DFT) calculations, and femtosecond transient absorption (fs-TA) spectroscopy collectively supported a dynamic-quenching contribution consistent with a PET-mediated pathway.

This study introduces a design strategy that integrates molecular-structure regulation, aggregation-morphology control, and the coordinated optimization of analyte accessibility and PET response. It highlights the key role of film morphology in balancing solid-state emission efficiency and PET quenching, providing a route toward fluorescent vapor-sensing films that combine high brightness, a broad detection range, rapid response, and good reversibility.

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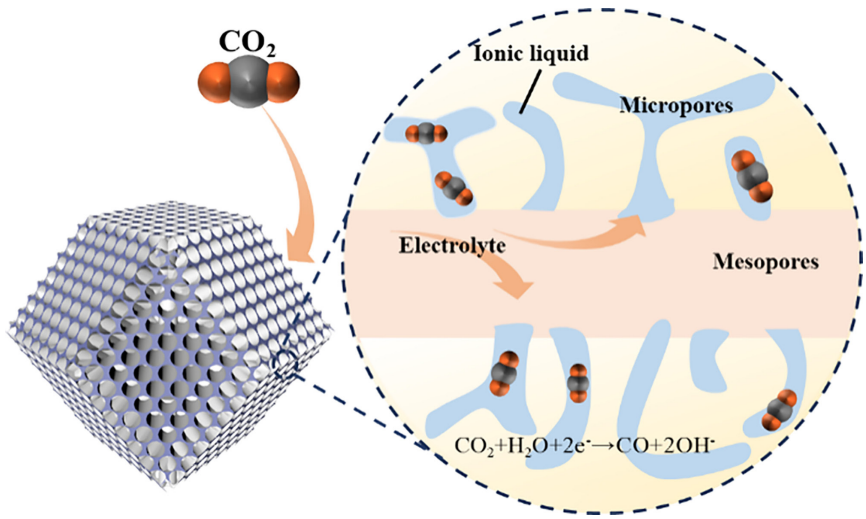
Research Article

Nanoconfined Ionic Liquids Enhance CO_2 Electroreduction in Ordered Hierarchical Porous Single-Atom Ni Catalysts

Ruirui Liu, Chen Jia, Boxia Guo, Yuhong Huang,* Li Han,* Ruizhi Wu, Quentin Meyer, Haochen Lu, Mengmeng Yang, Soshan Cheong, Xin Bo,* and Chuan Zhao*

分级多孔的单原子镍催化剂中限域离子液体提升 CO_2 电还原性能

Liu Ruirui, Jia Chen, Guo Boxia, Huang Yuhong*, Han Li*, Wu Ruizhi, Meyer Quentin, Lu Haochen, Yang Mengmeng, Cheong Soshan, Bo Xin* and Zhao Chuan*, , ACS Sustain. Chem. Eng., 2026, DOI: https://doi.org/10.1021/acssuschemeng.6c08072



单原子催化剂可最大化金属原子利用率并且拥有明确的活性位点，在电化学二氧化碳还原反应中极具应用前景。然而，活性位点密度低和传质不足限制了其电催化性能。在此，我们报道了一种结合了纳米限域离子液体的高度有序分级多孔单原子镍催化剂，用于二氧化碳还原反应催化。相互连通的大孔和介孔提供了高效的传输路径，而限域在微孔网络内的疏水性离子液体则增强了局部二氧化碳的可利用性。该杂化催化剂实现了接近100% 的一氧化碳法拉第效率，并将部分电流密度提升至 32 mA cm^{-2}，性能优于传统 Ni–N–C 催化剂。此外，其在微量二氧化碳条件下仍能保持高活性，进一步证实了纳米限域离子液体所实现的局部二氧化碳富集效果。原位谱学研究表明，分级多孔结构和限域离子液体增强了镍位点的催化参与程度并显著改善了传质。密度泛函理论计算进一步揭示，离子液体调控了镍位点的电子结构，并降低了关键中间体的形成能。这种分级孔隙与局部微环境工程的协同整合，为推进高性能电催化提供了一条可行路径。

第一作者：澳大利亚新南威尔士大学博士研究生刘蕊瑞

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全文链接：https://doi.org/10.1021/acssuschemeng.6c08072

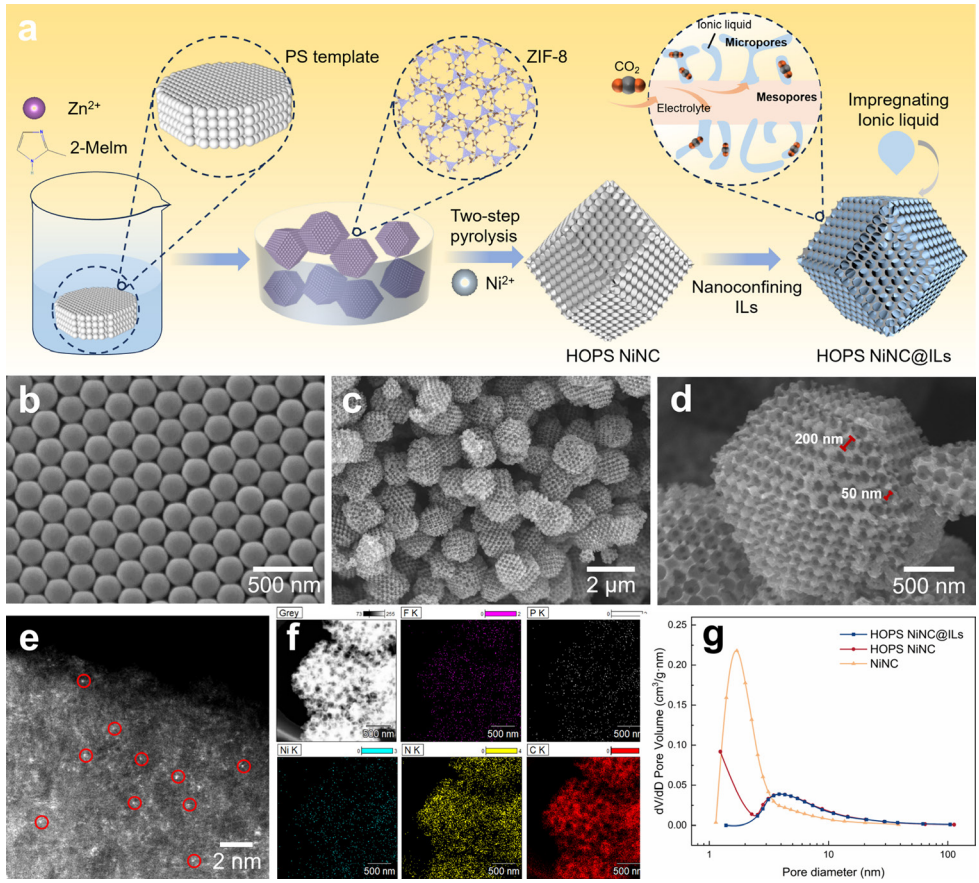

图 1. 多孔材料限域离子液体的制备方法，孔结构和孔径分布

Figure 1. Synthesis and morphology of HOPS NiNC@ILs and the corresponding pore structure and dispersion

Single-atomcatalysts (SACs) are promising for the electrochemical carbon dioxide reduction reaction (CO_2RR) owing to their maximum metal utilization and well-defined active sites. However, the low density of active sites and inadequate mass transport limit their electrocatalytic performance. Here, we report a highly ordered hierarchical porous Ni SAC incorporating nanoconfined ionic liquids (ILs) for CO_2RR. The interconnected macropores and mesopores provide efficient transport pathways, while hydrophobic ILs nanoconfined within the microporous network enhance local CO_2 availability. The hybrid catalyst delivers nearly unity CO Faradaic efficiency and enhanced partial current densities up to 32 mA cm^{-2}, outperforming conventional Ni-N-C catalysts. Moreover, its ability to maintain high activity under diluted CO_2 conditions further supports enhanced local CO^2 availability enabled by the nanoconfined ILs. *Operando* spectroscopies suggest enhanced catalytic engagement of Ni sites and significantly enhanced mass transfer enabled by the hierarchical porous structure and nanoconfinement of ILs. Density functional theory calculations further reveal that the ILs modulate the electronic structure of Ni sites and lower the formation energy of the key intermediates. This synergistic integration of hierarchical porosity and local microenvironment engineering offers a viable pathway for advancing high-performance electrocatalysis.

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Correspondence Authors: Prof. Zhao Chuan, University of New South Wales; Prof. Han Li, Zhengzhou University; Prof. Huang Yuhong, Institute of Process Engineering, Chinese Academy of Sciences; A/Prof. Bo Xin, Shaanxi Normal University
Full Text Link: https://doi.org/10.1021/acssuschemeng.6c08072

浙江大学谢涛教授应邀作报告

Prof. Xie Tao of Zhejiang University invited to give a report

2026 年 8 月 18 日下午，浙江大学化学工程与生物工程学院谢涛教授应邀到访陕西师范大学新概念传感器与分子材料研究院，并作题为“非平衡态高分子网络”的学术报告。

报告中，谢涛教授阐述了交联聚合物网络结构调控的创新理论和方法。针对传统交联聚合物的网络结构多处于高度无序平衡态，且结构调控自由度有限的情况，其团队引入“非平衡态”概念，突破该类材料长期以来的性能上限。他还结合近年来分子设计手段的拓展，阐释了这一理念为聚合物材料未来发展带来的范式转变。

在交流环节，谢涛教授与现场师生围绕非平衡态高分子网络的分子设计策略、独特功能特性以及在 3D 打印工业化应用前景等问题进行了交流与讨论。

本次报告会由刘太宏教授主持。研究院师生，西安交通大学胡斌教授、何刚教授，及西北工业大学王红月副教授等 40 余人参加了报告会。

On August 18, 2026, Prof. Xie Tao from the School of Chemical and Biological Engineering at Zhejiang University was invited to visit the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University, where he presented a report titled “Non-equilibrium Polymer Networks”.

In his report, Prof. Xie Tao elaborated on innovative theories and methods for regulating the network structures of cross-linked polymers. Addressing the fact that the network structures of traditional cross-linked polymers are often in a highly disordered equilibrium state and have limited degrees of freedom for structural regulation, his team introduced the concept of “non-equilibrium states”, thereby breaking through the long-standing performance limits of such materials. He also explained how this concept, combined with recent advancements in molecular design techniques, represents a paradigm shift for the future development of polymer materials.

During the Q&A session, Xie Tao discussed with faculty and students in attendance on topics such as molecular design strategies for non-equilibrium polymer networks, their unique functional properties, and the prospects for their industrial applications in 3D printing.

The session was moderated by Prof. Liu Taihong. More than 40 people attended the event, including INCSMM faculty and students, as well as Professors Hu Bin and He Gang from Xi’an Jiaotong University and Assoc. Prof. Wang Hongyue from Northwestern Polytechnical University.

法国国家科学研究中心 Aloyse Degiron 和 Hervé Aubin 教授应邀作报告

CNRS Professors Aloyse Degiron and Hervé Aubin invited to give reports

2026 年 8 月 18 日下午，法国国家科学研究中心（CNRS）的 Aloyse Degiron 和 Hervé Aubin 教授应邀到访陕西师范大学新概念传感器与分子材料研究院，并分别作题为 Exploring New Prospects for Optoelectronics with Colloidal Quantum Dots Hybridized with Nanophotonic Environments 和 ESR-STM of FePc Molecules in the Strong Coupling Regime 的学术报告。

报告中，Degiron 教授介绍了量子点与超材料耦合的光电子器件。其中，超材料增强量子点发光，但是其载流子寿命与其所处光子环境无关。他借助载流子热化理论对该观测结果给出了解释，并探讨了背后的基础物理机制。Aubin 教授则以沉积于衬底上的铁酞菁（FePc）分子为研究对象，介绍了其团队在电子自旋共振扫描隧道显微镜（ESR-STM）研究中的新突破。他们利用针尖与 FePc 分子之间的自旋耦合相互作用，实现自旋隧道电流调控。

本次报告会由刘太宏教授主持。研究院师生，西安交通大学胡斌教授、何刚教授，及西北工业大学王红月副教授等 40 余人参加了报告会，并与两位教授进行了互动交流。

On August 18, 2026, Professors Aloyse Degiron and Hervé Aubin from the French National Center for Scientific Research (CNRS) were invited to visit the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University, where they presented reports titled “Exploring New Prospects for Optoelectronics with Colloidal Quantum Dots Hybridized with Nanophotonic Environments” and “ESR-STM of FePc Molecules in the Strong Coupling Regime”, respectively.

In his presentation, Prof. Degiron discussed optoelectronic devices that couple quantum dots with metamaterials. In these devices, metamaterials enhance the luminescence of quantum dots, but the carrier lifetime is independent of the surrounding photonic environment. He explained this observation using the theory of carrier thermalization and explored the underlying physical mechanisms. Prof. Aubin, focusing on ferrocyanide (FePc) molecules deposited on a substrate, presented his team’s new breakthrough in electron spin resonance scanning tunneling microscopy (ESR-STM) research. By utilizing the spin-coupling interaction between the probe tip and the FePc molecules, they achieved control over the spin-tunneling current.

The session was moderated by Prof. Liu Taihong. More than 40 people, including INCSMM faculty and students, as well as Professors Hu Bin and He Gang from Xi’an Jiaotong University and Assoc. Prof. Wang Hongyue from Northwestern Polytechnical University, attended the event and engaged in a discussion with the two professors.

我的大学 我的恩师

何 刚

时间确是一件奇妙的事物，不知不觉间人生已走过四十余载。古人说“四十不惑”，可真到了这个年纪，却发现诸多往事反而日渐模糊，不复从前那般清晰。近来喜读回忆性文章，吉林大学的《闻雁集》、复旦大学的《旦苑晨钟》，其中每一篇我都细细品读，读来饶有兴味。或许是时间的缘故，那些文字总在催促着我去回望自己走过的路。今年恰逢恩师房喻院士七十华诞，更坚定了我用浅薄文字记录下那些过往的决心。文字或许简朴，可真到了提笔之时，竟不知从何写起，那就将思绪拉回到二〇〇一年的那个秋天吧。

一、从汉中到陕西师范大学

我于一九八二年出生在汉中一个普通的农村家庭。人生的前十八年波澜不惊，我在汉中度过了一个完整而幸福的时光。彼时对科学并无太深的概念，或许是因为身处小城的缘故吧。初高中期间，我深受外公的影响。外公生于一九二八年，平反后在一所中学担任英语教师。可以想见，一位白发苍苍的老者，操着一口还算流利的英语，那是一幅多么动人的画面。多年以后，当我听房老师讲起他为何考入陕西师范大学时，心中骤然生出一种难以言喻的共鸣。原来我们进入同一所大学的缘由，竟如此相似，都是受一位从事教育事业的亲人的影响。

二〇〇一年的那个秋天，父亲母亲陪我从汉中来到西安。至今仍记得那是一个夜晚，同样不常远行的父母与我一样，显得略有些局促与紧张。火车傍晚出发，清晨七时许抵达西安，我们一家三口拖着沉重的行李走出西安站。依稀记得学校的学长学姐接应我们，拖着重重行李坐上了学校迎接新生的校车，将我们带到了陕西师范大学，如今的陕西师范大学雁塔校区，当地俗称“吴家坟”的地方。一进校门，映入眼帘的景象与我想象中的大

学并不一致。陕师大确是一座优美、庄重而古朴的学府，可那天走到学子食府门口时，天空正飘着小雨，门口尚在维修，未能赶在开学前竣工。那一片泥泞的工地，让我瞬间对大学生活产生了强烈的落差感。我想，我的大学不应如此，我的大学应是电视剧、电影里那般模样。所幸学校为我们分配的寝室相当不错，应是当时校区内最好的宿舍，上床下桌的四人间。和舍友胡云贺、李颖之简单交流后，我在陕师大的第一天开始了。

办完入学手续后，当时的化学与材料科学学院将到校的家长们聚到教学七楼二层的会议室，召开了一次十分特殊的家长会。我并未参加，这些皆是后来听父母口述的。在他们的描述中，有一位院士为他们做了一场非常亲切的报告。说实话，父母并未描述得很详细，我并不知当时讲了些什么。大抵是入学半年之后，我才知道那位院士便是我们敬爱的高世扬院士。十分遗憾的是，在我读大二期间，高院士不幸辞世，未能当面聆听他的教诲，是我人生的一件憾事。毕竟，他是我人生中认识的第一位院士，亦是我父母见过的第一位院士。

开学后的军训，让我对这所大学有了别样的感受。我记得开学两周之内，学子食府便已完全落成，我们军训之余便有了可口的饭菜。时至今日我依然认为，陕师大的食堂在全国高校中名列前茅，“吃在师大”的美誉绝非虚名。

大学时光过得飞快。初入课堂，依稀记得马别厚老师等一群老教师用浓厚的关中话授课，班上大半同学都不大听得懂老师在讲什么，但依然觉得老师们激情洋溢、投入至极。渐渐地，许多同学都开始学习关中话。如今我这一口半生不熟的关中话，大抵便是那时练就的。同窗情谊与知识浇灌，使我很快适应了学校的生活。我的几位挚友，洪波、杨保林等，我们十分喜欢到学校的各处走走，去了解这所大学的底蕴、文化，以及它的每一个角落，图书馆、体育馆、电影院、大礼堂。我们也渴望认识每一位师长。说起来也奇怪，入校将近一年时，我们几个朋友竟从未谈论过校长是谁，仅是在开学典礼上远远见过一面。当时只道是寻常。在吴家坟这片美丽的七百余亩土地上，我愉快地度过了一年多的光阴。

二、初见恩师

大学生活过得很快。在求学的日子里，有挚友相伴，我也认识了晏妮，陪伴我至今的妻子。我们尽情享受着大学的美好时光，那时我们高谈阔论，谈理想、谈未来、谈今后要做的事。正是“鲜衣怒马少年时，不负韶华行且知”的年纪。

青春大抵都与酒有关。我与几位挚友—洪波、杨宝林、李召虎、田巍等—时常聚在一起，一两瓶啤酒、一盘花生米，便可畅聊至深夜。操场边、下了班的餐厅里、宿舍中，常常是诗酒趁年华。然而我们最喜爱的地方，是学子食府后面的曲江流饮。那里有一方不大不小的池塘，几座石凳，几座假山，虽小巧，却是我们最爱相聚之处。夜晚，我们以几瓶啤酒、几碟小菜，便可从当日课堂的趣事、新学的知识，一直聊到未来，聊到各自的理想。

除去在开学典礼等极远距离的场合之外，我几乎对恩师房喻老师没有太多印象。记得是二〇〇三年六月的一个深夜，将近零点，我与洪波、宝林三人刚从晚自习出来，一人手提一瓶啤酒，坐在曲江流饮，正享受着青春时光。突然，洪波抬手一指：“看，那是我们的校长！”

那一幕我至今铭记于心。一位身材高大、英气逼人的先生，骑着一辆自行车，车后夹着一只公文包，从我们身旁疾驰而过。那夜的灯光格外明亮，这点要感谢师大，校园里的用电从不限制，夜晚总是灯火通明，或许也与女生较多有关吧。借着明亮的灯光，洪波指着那位老师说道：“这就是咱们的校长，化学系最杰出的学者，房喻校长。”

彼时我竟不甚清楚校长是谁，只知化学系有极厉害的科学家。此后半个多小时，我们的话题始终围绕着房老师，用各自并不准确、零零星星的见闻，试图拼凑出一个完整的房喻老师。“高山仰止”，大概便是我们当时唯一的心情。桃李不言，下自成蹊。多年以后我才真正明白，那个深夜骑车远去的身影，本身便是一堂无言的人生课。

人生便是如此奇妙。有了这样一个小小的插曲，我对房老师产生了极大的兴趣，很想知道这位深夜才返家的校长、科学家究竟在做什么。当然，也可能是随着时光流逝、年岁渐长，在多种场合有幸多次聆听房老师的演讲，对房老师有了清晰却又模糊的印象。但那时尚未有任何想法，或者说，并不觉得人生能有怎样的幸运，可以与房校长近距离接触与交流。

三、叩门

大学时光飞逝，转眼便到了二〇〇四年，也就是大三下学期。由于自己大学期间较为贪玩，未能获得保研资格，我们几位朋友开始商议毕业后的出路，是否要报考研究生。二〇〇五年本科毕业时，作为陕师大的毕业生，工作尚不难寻，家人也觉得可以安安稳稳寻一所中学任教，平平淡淡过完一生。但在那个夏天，我突然不想那么按部就班地过一辈子。于是，在晏妮和几位朋友的相互鼓励下，我们决定考研，我也确认考本校，晏妮考中科院。那个年代信息相对闭塞，我竟懵懂地不知提前与导师联系，只是自己打开课本埋头复习。

二〇〇四年冬，我们参加了硕士研究生入学考试。同时，也申请了本科毕业论文的指导老师。我将在高玲香老师课题组进行本科毕业论文工作，晏妮则在李宝林老师课题组做本科论文。那时我知道有同学已进入房老师课题组，心中不免生出几分羡慕。

转年至二〇〇五年春，甫一开学，

我们便得知了考研成绩。考取本校相对容易，我取得了材料学专业第一名的成绩。遗憾的是，晏妮没发挥好，无缘中科院，她斗志不灭，决定再考一次。那时我已收起玩心，将大量时间投入本科毕业论文之中，我的本科毕业论文题目是关于碳酸钡纳米电流体的相关工作。我很喜欢做实验的感觉，很庆幸自己选择了考研。当然，这要归功于高玲香老师对我的悉心指导。在那段时期，我与高子伟老师以及他的老师王冀英先生相识，他们都对我后来的发展产生了深远影响。考研成绩公布后，紧接着便是面试。我们当时是先考试、后选导师，与导师双向选择。一日，我与高玲香老师闲谈，高老师说：“这都是可以双向选择的，你们也可以去了解一下其他研究方向和老师。”或许是因为得知自己考了第一名的缘故，我不禁想，是否可以去其他课题组看一看？恰逢有同学在房老师课题组做本科毕业论文，听了他们对课题组的简要介绍后，心中便萌生了这个念头。

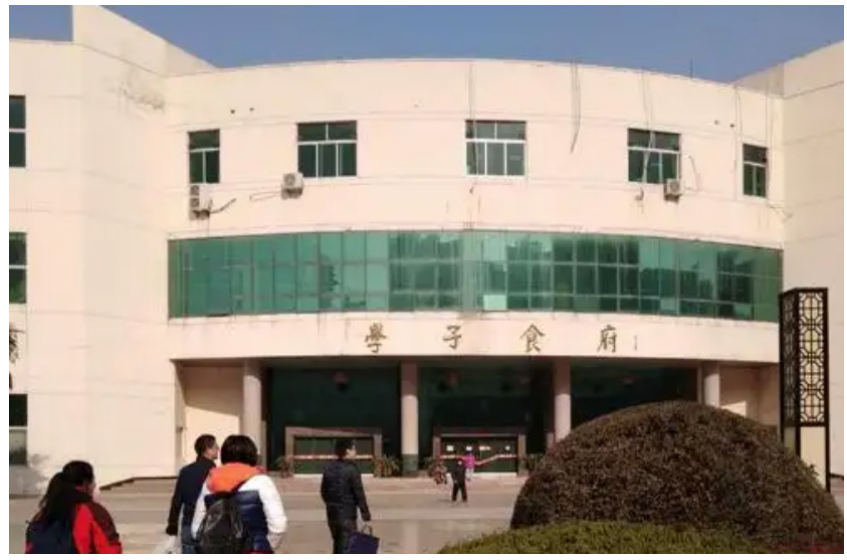
虽然我在师大已生活了近四年，但对科学研究这一领域并不十分了解。在同学的介绍下，我得知房老师课题组有一位高莉宁师姐，实验室的诸多事务多由她操心。于是我壮着胆子，与晏妮一同在楼下等候这位高师姐。那天我十分冒昧地上前自我介绍：我是今年的毕业生，刚参加完考研复试，想询问是否有机会加入房老师的课题组。后来我才知道，每年报考房老师的学生人数相当多。高师姐问我考得如何、以往学习成绩怎样。对以往的学习我并无多少信心，但对于考研结果，我还略带得意地说：“我还不错，考了第一名。”不料师姐当头一句话便让我心凉了半截，她说：“房老师这几年，第一名向来不收。”

我心中十分不解：这是为何？即便如此，我还是厚着脸皮请师姐向房老师转达我的信息。我心想，无论如何也值得一试，这或许是我人生中为数不多的一个优点吧。后来有一天，房老师叫我和另一位考取他研究生的李慧慧一后来亦是我的同门一到办公室做简短交流。十分奇怪的是，至今我只记得有过这样一次会面，却全然忘记了房老师与我说了些什么，大概是当时太过紧张了。我只记得房老师告诉我，他不招第一名，是因为他在担任行政职务，不能每次都把最优秀的学生招入自己课题组。但可能我当天还是个精神小伙吧，房老师说他会考虑考虑。其余的我当真毫无印象了，也许人紧张到极点时，都会出现这样或那样的选择性遗忘。

过了一段时间，房老师终于同意接收我为他的研究生了。我的去向确定后，晏妮也决定再次考研，并且也要考入房老师门下。这一心愿在第二年顺利实现。得知房老师接收我后，我心中既无比紧张，又万分兴奋。同时，我也对高玲香老师满怀愧疚，由衷感谢高玲香老师给予我机会，让我顺利完成本科论文。二〇〇五年暑假，陕师大正在筹办 IUPAC 物理化学卫星会议，高子伟老师担任会议秘书。因我在高玲香老师课题组做本科论文时表现尚可，高子伟老师则让我做了他的秘书。正是在那段筹办会议的日子里，我才真正与房老师有了近距离的接触。可以说也是从那时起，我见到房老师才不再那般胆怯与羞怯，也有了简短的交流。

彼时我不过是一个刚毕业的大学生，混迹于秘书组做些最基础、最琐碎的工作。但那时我看到房老师课题组的各位师姐，她们在会议上忙碌工作但都游刃有余，令我艳羡不已。我也盼望着有朝一日能像她们一样，在学术会议上承担一些工作。那次会议令我大开眼界。我见到了田中群院士、任斌老师，多年后我还与任斌老师忆起这段往事。他或许是我在校外结识的第一位大师了。我还见到了世界级的学术大家，印象最深刻的便是撰写了经典教材《Physical Chemistry》的牛津大学 Peter Atkins 教授。看着房老师与这些世界级学者亲切交流，心中对房老师的敬仰之情愈发深厚。在那次会议上，我也认识了房小华，当时她还是一个高中生。我特别羡慕她能用一口流利的英语与这些国外教授交流，后来才知晓她是房老师的爱女。我被指派与她以及几位研究生一起，陪同这些世界级学者前往兵马俑博物馆参观。小华负责沟通交流，我则负责办理各项手续。与华华顶着烈日、背着大袋饮用水的画面，至今历历在目。

（连载一，未完待续）



My University, My Mentor

by He Gang

Time is truly a wondrous thing; before I knew it, more than forty years of my life had passed. The ancients said, "At forty, one is free from confusion," but now that I've actually reached this age, I find that many memories are growing increasingly hazy and are no longer as clear as they once were. Lately, I've taken great pleasure in reading reflective essays — such as Wen Yan Ji (Collection of Hearing the Geese) from Jilin University and Dan Yuan Chen Zhong (Fudan Campus Morning Bell) from Fudan University. I've savored every single piece, finding them deeply engaging. Perhaps it's the passage of time, but these writings constantly urge me to look back on the path I've traveled. This year marks the 70th birthday of my esteemed mentor, Chinese Academy of Science Academician Fang Yu, which has further strengthened my resolve to record those memories in my own humble words. My writing may be simple, but when I actually sit down to write, I find myself at a loss for where to begin. So, let me take my thoughts back to that autumn of 2001.

I. From Hanzhong to Shaanxi Normal University

I was born in 1982 into an ordinary rural family in Hanzhong. The first eighteen years of my life were uneventful; I spent a fulfilling and happy time in Hanzhong. Back then, I didn't have a very deep understanding of science—perhaps because I lived in a small town. During my junior high and high school years, I was deeply influenced by my grandfather. Born in 1928, he worked as an English teacher at a middle school after his name was cleared. One can easily imagine what a moving sight it must have been—a white-haired elderly man speaking English with reasonable fluency. Many years later, when I heard Teacher Fang explain why he had been admitted to Shaanxi Normal University, I suddenly felt an indescribable sense of resonance. It turned out that the reasons we both entered the same university were strikingly similar: we were both influenced by a relative who was dedicated to the field of education.

That fall in 2001, my parents accompanied me from Hanzhong to Xi'an. I still remember that night clearly; my parents, who rarely traveled far, seemed just as nervous and a little uneasy as I did. The train departed in the evening and arrived in Xi'an around seven in the morning. The three of us, dragging our heavy luggage, walked out of Xi'an Station. I vaguely recall that senior students from the university were there to meet us. We boarded the university's shuttle bus for new students, still hauling our heavy luggage, and were taken to Shaanxi Normal University — now known as its Yanta Campus, a place locally referred to as "Wujiafen". As soon as we stepped through the campus gate, the scene that met my eyes didn't match the university I'd imagined. Shaanxi Normal University was indeed a beautiful, dignified, and rustic institution of higher learning, but that day, as we approached the entrance to the student dining hall, a light rain was falling, and the entrance was still under construction—it hadn't been completed in time for the start of the semester. That muddy construction site instantly made me feel a stark disconnect from my expectations of college life. I thought to myself, "My college experience shouldn't be like this; it should be just like what I've seen in TV shows and movies". Fortunately, the dormitory the university assigned us was quite nice—probably the best on campus at the time — a four-person room with beds on top and desks below. After a brief introduction to my roommates, Hu Yunhe and Li Yingzhi, my first day at Shaanxi Normal University began.

After completing the enrollment procedures, the School of Chemistry and Materials Science at the time gathered the parents who had come to campus in a conference room on the second floor of Teaching Building 7 for a very special parent-teacher meeting. I did not attend; I learned all of this later from my parents' accounts. According to their description, an academician gave them a very warm and approachable presentation. To be honest, my parents didn't go into much detail, so I don't know exactly what was said at the time. It wasn't until about half a year after I started school that I learned that the academician was none other than our beloved Academician Gao Shiyang. Unfortunately, Academician Gao passed away during my sophomore year, and not having had the opportunity to hear his teachings in person remains one of the greatest regrets of my life. After all, he was the first academician I ever met, and he was also the first academician my

parents had ever met.

The military training at the start of the semester gave me a unique perspective on this university. I remember that within two weeks of the semester beginning, the Student Dining Hall was already fully completed, so we were able to enjoy delicious meals during our breaks from training. To this day, I still believe that Shaanxi Normal University's canteens rank among the best in the country, and the reputation that "Shaanxi Normal University is a food lover's paradise" is well-deserved.

My college years flew by fast. I vaguely remember my first days in class, when a group of veteran professors — including Prof. Ma Biehou — taught in a thick Guan Zhong (Central Shaanxi) dialect. Most of my classmates couldn't quite understand what the professors were saying, but we still felt that they were full of passion and completely dedicated to their work. Gradually, many of us began to learn the Guan Zhong dialect. My somewhat halting Guan Zhong dialect today was largely honed during that time. Nurtured by the bonds of friendship and the knowledge I gained, I quickly adapted to campus life. My close friends — Hong Bo, Yang Baolin, and others — and I loved exploring every corner of the campus to discover the university's heritage, culture, and every nook and cranny: the library, the gymnasium, the movie theater, and the auditorium. We were also eager to get to know every faculty member. Strangely enough, even after nearly a year at the university, the few of us had never once discussed who the president was; we'd only caught a glimpse of him from afar at the opening ceremony. At the time, we simply took it for granted. On this beautiful stretch of land spanning over 700 mu (about 115 acres) at Wujiafen, I happily spent more than a year of my life.

II. My First Encounter with My Mentor

College life flew by. During my time at university, I was surrounded by close friends, and I also met Yan Ni, who has who has been my wife all these years. We thoroughly enjoyed our wonderful college days; back then, we would engage in lively discussions about our ideals, our future, and the things we hoped to accomplish. It was truly the age described by the verse: "In our youth, clad in fine clothes and riding spirited horses, we made the most of our prime years with purpose and wisdom".

Youth is, for the most part, intertwined with alcohol. My close friends — Hong Bo, Yang Baolin, Li Zhaohu, Tian Wei, and others — and I would often get together; with just a bottle or two of beer and a plate of peanuts, we could chat away until late into the night. Whether by the sports field, in a restaurant after work, or in our dorm, we often made the most of our youth with poetry and wine. However, our favorite spot was Qujiang Liuyin, behind the Xuezhi Restaurant. There was a pond — neither too large nor too small — along with a few stone benches and some rockeries. Though modest in size, it was our favorite place to gather. At night, with just a few bottles of beer and a few plates of snacks, we'd chat about everything from amusing classroom

anecdotes and newly acquired knowledge to our future and our individual aspirations.

Apart from occasions where we were very far away, such as the opening ceremony, I don't have many memories of my beloved teacher, Prof. Fang Yu. I remember one late night in June 2003, around midnight, when the three of us — Hongbo, Baolin, and I — had just finished evening study hall. Each of us was holding a bottle of beer as we sat by the Qujiang Liuyin, sipping our drinks and savoring the moments of our youth. Suddenly, Hongbo raised his hand and pointed: "Look, there's our president!"

That scene remains etched in my memory to this day. A tall, dashing gentleman, riding a bicycle with a briefcase clamped to the back, sped past us. The lights that night were exceptionally bright — thanks to the university, which never restricted electricity use; the campus was always brightly lit at night, perhaps partly because there were so many female students. Under the bright lights, Hongbo pointed to the professor and said, "That's our president — the most distinguished scholar in the Chemistry Department, President Fang Yu".

At the time, I wasn't even quite sure who the president was; I only knew that the Chemistry Department had an exceptionally brilliant scientist. For the next half hour or so, our conversation revolved entirely around Prof. Fang, as we tried to piece together a complete picture of him using our own inaccurate and scattered bits of information. "A towering figure to look up to" — that was probably the only feeling we all shared at the time. The peach and the plum trees say nothing, yet paths form beneath them. It wasn't until many years later that I truly understood: that figure riding away on a bicycle late that night was, in itself, a silent lesson in life.

Life is truly wonderful. Because of this little incident, I became extremely interested in Prof. Fang and was eager to find out what this principal and scientist — who didn't return home until late at night — was actually doing. Of course, it may also be that as time passed and I grew older, having had the good fortune to listen to Prof. Fang's lectures on numerous occasions, I formed a clear yet vague impression of him. But at that time, I hadn't given it much thought — or rather, I didn't realize what a stroke of luck it would be to have the opportunity to interact with President Fang up close.

III. Knocking on the Door

My college years flew by, and before I knew it, it was 2004 — the second semester of my junior year. Since I'd been a bit of a slacker during my college years and hadn't qualified for direct admission to graduate school, a few of us friends began discussing our post-graduation plans and whether to apply for graduate school. When I graduated with my bachelor's degree in 2005, as a graduate of Shaanxi Normal University, it wasn't too difficult to find a job. My family also thought it would be best for me to find a stable teaching position at a middle school and live a quiet, uneventful life. But that summer, I suddenly realized I didn't want to live my life following such a predictable path. So, with mutual encouragement from Yan Ni and a few friends, we decided to take the graduate entrance exam. I decided to apply to my own university, while Yan Ni applied to the Chinese Academy of Sciences. Information was relatively scarce back then, and I was so naive that I didn't even think to contact a potential advisor in advance; I simply opened my textbooks and buried myself in studying.

In the winter of 2004, we took the master's entrance exam. At the same time, we also applied for advisors for our undergraduate theses. I would be working on my undergraduate thesis in Prof. Gao Lingxiang's research group, while Yan Ni would be working on hers in Prof. Li Baolin's research group. At that time, I knew that some of my classmates had already joined Prof. Fang's research group, and I couldn't help but feel a bit envious.

Fast forward to the spring of 2005. As soon as the semester began, we received our graduate school entrance exam results. It was relatively easy to get into our own university, and I ranked first in the Materials Science program. Unfortunately, Yan Ni didn't perform as well as she could have and missed her chance to enter the Chinese Academy of Sciences, but her determination remained undaunted, and she decided to take the exam again. By then, I had put my playful side aside and was devoting a great deal of time to my undergraduate thesis. The topic of my undergraduate thesis was related to barium carbonate nanofluids. I really enjoyed the feeling of conducting experiments and was very glad I had chosen to pursue graduate studies. Of course, this was largely thanks to Prof. Gao Lingxiang's meticulous guidance. During that period, I met Prof. Gao Ziwei and his mentor, Prof. Wang Jiying; both had a profound influence on my future development. After the exam results were announced, the interviews followed immediately. At that time, we took the exam first and then selected an advisor — it was a mutual selection process between students and advisors. One day, while chatting casually with Prof. Gao Lingxiang, she said, "This is a mutual selection process; you can also explore other research areas and faculty members". Perhaps because I had just learned that I had scored first place on the exam, I couldn't help but wonder if I could visit other research groups. Coincidentally, some classmates were working on their undergraduate theses in Prof. Fang's research group, and after hearing their brief introduction to the group, the idea took root in my mind.

Although I've been at Shaanxi Normal University for nearly four years, I didn't know much about scientific research. Through a classmate, I learned that there was a senior student named Gao Lining in Prof. Fang's research group, who handled many of the lab's affairs. So I mustered up my courage and waited downstairs with Yan Ni for her. That day, I rather boldly stepped forward

to introduce myself: I was a senior graduating this year, had just finished the second round of graduate school entrance exams, and wanted to ask if there was a chance to join Prof. Fang's research group. I later learned that a considerable number of students apply to join Prof. Fang's group every year. Miss Gao asked me how the exam had gone and what my past academic performance had been like. I didn't have much confidence in my past academic performance, but regarding the postgraduate entrance exam results, I said with a touch of pride, "I did pretty well — I came in first." Unexpectedly, her first remark left me feeling disheartened. She said, "In recent years, Prof. Fang has never accepted the top-ranked candidate".

I was completely baffled: Why was that? Even so, I put my pride aside and asked my senior classmate to pass my message on to Prof. Fang. I thought to myself that it was definitely worth a try — perhaps this was one of the few good qualities I had in my life. Later, one day, Prof. Fang asked me and another student who had been accepted into his graduate program — Li Huihui, who later became my fellow student — to come to his office for a brief conversation. Strangely enough, to this day I only remember that this meeting ever took place, but I've completely forgotten what Prof. Fang said to me — I suppose I was just too nervous at the time. I only remember Prof. Fang telling me that he didn't recruit the top-ranked student because he held an administrative position and couldn't always admit the most outstanding students into his research group. But perhaps I was still a spirited young man back then, because Prof. Fang said he would give it some thought. I truly have no recollection of anything else — perhaps when people are extremely nervous, they experience this kind of selective amnesia.

After some time, Prof. Fang finally agreed to accept me as his graduate student. Once my plans were set, Yan Ni also decided to retake the graduate entrance exam, with the goal of joining Prof. Fang's program as well. This wish was successfully fulfilled the following year. Upon learning that Prof. Fang had accepted me, I felt both incredibly nervous and immensely excited. At the same time, I felt deeply indebted to Prof. Gao Lingxiang and was sincerely grateful to her for giving me the opportunity to successfully complete my undergraduate thesis. During the summer of 2005, Shaanxi Normal University was organizing the IUPAC Satellite Conference on Physical Chemistry, and Prof. Gao Ziwei served as the conference secretary. Since I had performed reasonably well while working on my undergraduate thesis in Prof. Gao Lingxiang's research group, Prof. Gao Ziwei asked me to serve as his secretary. It was precisely during those days of conference preparation that I truly had close contact with Prof. Fang. It could be said that it was from that time onward that I no longer felt so timid and shy when I saw Prof. Fang, and I was able to have brief exchanges with him.

At the time, I was just a recent college graduate, working my way through the most basic and menial tasks in the secretarial office. But I watched the senior female students in Prof. Fang's research group as they bustled about at conferences, handling everything with ease — and I was filled with admiration. I, too, looked forward to the day when I could take on responsibilities at academic conferences just like them. That conference was a real eye-opener for me. I met Academician Tian Zhongqun and Prof. Ren Bin; many years later, I even reminisced about this experience with Prof. Ren. He was perhaps the first academic giant I had the privilege of meeting outside of university. I also met world-class academic luminaries; the one who left the deepest impression on me was Prof. Peter Atkins of the University of Oxford, author of the classic textbook Physical Chemistry. Watching Prof. Fang interact warmly with these world-class scholars deepened my admiration for him even further. At that conference, I also met Fang Xiaohua, who was still a high school student at the time. I was particularly envious of her ability to converse fluently in English with these foreign professors; it was only later that I learned she was Prof. Fang's beloved daughter. I was assigned to accompany and guide these world-class scholars on a visit to the Terracotta Army Museum with her and several graduate students. Xiaohua handled the communication, while I took care of the administrative arrangements. The image of Xiaohua and me walking under the scorching sun, each carrying a large bag of drinking water, remains vivid in my memory to this day.

(Part 1 of 3, to be continued)

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