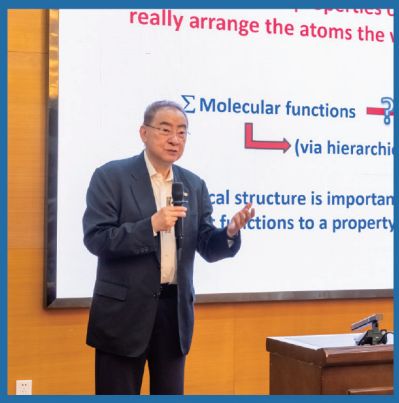
陕西师範大學 SHAANXI NORMAL UNIVERSITY

西安交通大學 XIAN JIAOTONG UNIVERSITY

2026年4月
April, 2026

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



目录 Contents

房喻院士出席中国科学院学部第十一届科学教育论坛

Fang Yu attends 11th Science Education Forum of Academic Divisions of Chinese Academy of Sciences

2026 年 4 月 7 日，房喻院士在上海出席了由中国科学院学部科学普及与教育工作委员会主办、上海交通大学承办的中国科学院学部第十一届科学教育论坛，并参加了“AI+HI 驱动下中小学科学课堂重构与个性化学习实践”分论坛交流研讨及上海交通大学未来教师能力提升计划启动仪式。

作为上海交通大学建校 130 周年活动之一，此次论坛以“AI+HI：重塑中小学科学课堂与个性化学习”为主题，上海交通大学校长、中国科学院院士丁奎岭，中国科学院学部工作局副局长薛淮，联合国开发计划署（UNDP）代理驻华代表 James George 等出席开幕式并致辞，中国科学院院士武向平、周忠和、王怀民、刘明，以及来自加拿大、阿根廷等国与香港、澳门及内地各高校和中小学的数百位专家学者参加论坛，共同探讨人工智能与人类智慧融合背景下科学教育的变革路径。

On April 7, 2026, Prof. Fang Yu attended the 11th Science Education Forum of Academic Divisions of the Chinese Academy of Sciences, hosted by the Committee on Science Popularization and Education of the CAS Bureau of Academic Divisions and organized by Shanghai Jiao Tong University in Shanghai and participated in the panel discussion titled “Reshaping Science Classrooms and Practice of Personalized Learning in Primary and Secondary Schools Driven by AI+HI” and the launch ceremony for SJTU Future Teacher Competence Program.

As part of the celebrations marking the 130th anniversary of Shanghai Jiao Tong University, this forum was held under the theme “AI+HI: Reshaping Science Classrooms and Personalized Learning in Primary and Secondary Schools”. Ding Kuiling, SJTU president and CAS academician; Xue Hui, deputy director of the CAS Bureau of Academic Divisions; and James George, acting resident representative of the United Nations Development Programme (UNDP) in China, attended the opening ceremony and delivered speeches. CAS academicians Wu Xiangping, Zhou Zhonghe, Wang Huimin, and Liu Ming, along with hundreds of experts and scholars from universities and K-12 schools in Canada, Argentina, Hong Kong, Macao, and China’s mainland, participated in the forum to jointly explore pathways for transforming science education against the backdrop of the integration of artificial intelligence and human intelligence.

房喻院士出席纪念西安交通大学建校 130 周年暨西迁 70 周年活动

Fang Yu attends commemoration of 130th Anniversary of Xi'an Jiaotong University and 70th Anniversary of Its Relocation to Xi'an

2026 年 4 月 8 日，房喻院士应邀出席了在西安交通大学思源学生活动中心举行的“纪念西安交通大学建校 130 周年暨西迁 70 周年——中国特色、世界一流大学高质量发展大会”。

On April 8, 2026, Prof. Fang Yu was invited to attend the “Conference on High-Quality Development of World-Class University with Chinese Characteristics: Commemorating the 130th Anniversary of Xi'an Jiaotong University and the 70th Anniversary of Its Relocation to Xi'an”, held at the Siyuan Student Activities Center at Xi'an Jiaotong University in Xi'an.

研究院召开实验室安全及保密工作培训会

Training Session on Laboratory Safety and Confidentiality held

2026 年 4 月 9 日，陕西师范大学新概念传感器与分子材料研究院在一层报告厅召开“实验室安全和保密工作”专题培训会。会议由丁立平副院长主持，研究院近百名师生参加培训学习。

On April 9, 2026, the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University held a special training session on “Laboratory Safety and Confidentiality” in the lecture hall. The session was chaired by vice dean Prof. Ding Liping, and attended by nearly 100 faculty members and students.

刘凯强教授受聘为曲江第三中学科学副校长

Prof. Liu Kaiqiang appointed vice principal for Science of Qujiang No. 3 Middle School

2026 年 4 月 10 日，陕西师范大学新概念传感器与分子材料研究院刘凯强教授受聘为曲江第三中学科学副校长。

On April 10, 2026, Prof. Liu Kaiqiang of the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University was appointed vice principal for Science of Qujiang No. 3 Middle School.

薄鑫参加先进材料及电化学工程产学研研讨会并作报告

Bo Xin presents at Industry-Academia-Research Symposium on Advanced Materials and Electrochemical Engineering

2026 年 4 月 11 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北京举行的先进材料及电化学工程产学研研讨会，并作了题为“科研与灵感——高效电解水制氢关键催化剂”的报告。

On April 11, 2026, Assoc. Prof. Bo Xin from the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University attended the Industry-Academia-Research Symposium on Advanced Materials and Electrochemical Engineering held in Beijing, where he presented a report titled “Research and Inspiration: Critical Catalysts for Efficient Water Electrolysis for Hydrogen Generation”.

研究院师生参加中国化学会第 35 届学术年会

SNNU INCSMM faculty and students attend CCS 35th Annual Conference

2026 年 4 月 11 日至 14 日，中国化学会第 35 届学术年会在重庆市召开，陕西师范大学新概念传感器与分子材料研究院房喻院士、丁立平教授、刘静教授、薛东旭教授、边红涛教授、马佳妮教授、彭浩南教授、刘太宏教授、刘忠山副教授、苗荣副教授、彭灵雅老师、赵智豪老师、马志彦博士后、翟宾宾博士后和多名学生参会。

房喻院士作了题为“面向传感与未来技术的分子材料”的分会主题报告。丁立平教授、边红涛教授作了题为“界面限域组装纳米膜创制及其 CBRN 高性能传感应用研究”和“溶液界面结构及吸附的非线性光谱研究”的分会邀请报告。

薛东旭教授、马佳妮教授、刘太宏教授、刘忠山副教授、苗荣副教授、彭灵雅老师作了题为“气体分离与存储驱动多组分 MOF 调控合成”“光笼分子化学反应机制研究”“分子激发态行为调控及双光子吸收”“荧光整体柱与微型分离检测一体化”“罗丹明分子内电荷转移调控及其应用”和“有机金属光催化反应机理研究和非绝热过程调控”的分会报告。

From April 11 to 14, 2026, Prof. Fang Yu, Prof. Ding Liping, Prof. Liu Jing, Prof. Xue Dongxu, Prof. Bian Hongtao, Prof. Ma Jiani, Prof. Peng Haonan, Prof. Liu Taihong, Assoc. Prof. Liu Zhongshan, Assoc. Prof. Miao Rong, Lecturer Peng Lingya, Lecturer Zhao Zhihao, Postdoctoral Researchers Ma Zhiyan and Zhai Binbin, and several students from the Institute

of New Concept Sensors and Molecular Materials at Shaanxi Normal University attended the 35th Annual Conference of the Chinese Chemical Society held in Chongqing.

Fang Yu delivered a session keynote report titled “Molecular Materials for Sensing and Future Technologies”, Ding Liping and Bian Hongtao presented invited session reports titled “Development of Interface-Confined Assembled Nanomembranes and Their Applications in High-Performance CBRN Sensing” and “Nonlinear Spectroscopic Studies of Interfacial Structures and Adsorption in Aqueous Solutions”, respectively.

Xue Dongxu, Ma Jiani, Liu Taihong, Liu Zhongshan, Miao Rong, and Peng Lingya presented session reports titled “Synthesis of Multicomponent MOFs Driven by Gas Separation

and Storage", "Study on the Reaction Mechanisms of Photocage Molecules", "Control of Molecular Excited-State Behavior and Two-Photon Absorption", "Integration of Fluorescent Monolithic Columns with Micro-Separation and Detection", "Regulation of Intramolecular Charge Transfer in Rhodamine and Its Applications", and "Research on the Mechanisms of Organometallic Photocatalytic Reactions and Regulation of Non-adiabatic Processes", respectively.

研究院研究生在中国化学会第 35 届学术年会上获奖

SNNU INCSMM graduate students win awards at CCS 35th Annual Conference

在 2026 年 4 月 11 日至 14 日于重庆市召开的中国化学会第 35 届学术年会上，陕西师范大学新概念传感器与分子材料研究院多名研究生参会，并获得多项奖励。

其中，2023 级博士生胡定芳获得 2026 年“克吕士杯”中国化学会胶体与界面化学研究生优秀成果奖一等奖，2025 级博士生周建成、2024 级硕士研究生窦小雅获得最佳墙报奖。

At the 35th Annual Conference of the Chinese Chemical Society, held from April 11 to 14, 2026 in Chongqing, several graduate students from the Institute of New Sensors and Molecular Materials at Shaanxi Normal University attended the conference and won multiple awards.

Among them, Hu Dingfang, a Class 2026 doctoral student, won the First Prize in the 2026 "Klüsch Cup" CCS Outstanding Graduate Research Achievement Award in Colloid and Interface Chemistry, while Zhou Jiancheng, a Class of 2028 doctoral student, and Dou Xiaoya, a Class 2027 master's student, were awarded the Best Poster Prize.

房喻院士团队入选中国研究生导师发展共同体首届优秀导师团队

Fang Yu's New Concept Sensors and Molecular Materials Team selected among Outstanding Supervisor Teams

近日，中国研究生导师发展共同体发布首届优秀导师与团队名单，房喻院士新概念传感器与分子材料团队入选“共同体首届研究生导师团队”。

团队成员为丁立平、刘静、边红涛、彭浩南、马佳妮、薛东旭、刘太宏、苗荣和刘小燕。

中国研究生导师发展共同体成立于 2025 年 6 月，是由哈尔滨工业大学倡议，来自全国 19 所高校共同发起成立的合作组织。

Recently, the Chinese Union for Supervisor Development announced the list of the first cohort of outstanding supervisors and teams. Prof. Fang Yu's New Concept Sensors and Molecular Materials Team was selected as one of the "First Cohort of Outstanding Graduate Supervisor Teams".

The team members are Ding Liping, Liu Jing, Bian Hongtao, Peng Haonan, Ma Jiani, Xue Dongxu, Liu Taihong, Miao Rong, and Liu Xiaoyan.

A collaborative organization initiated by Harbin Institute of Technology and co-founded by 19 Chinese universities, the Chinese Union for Supervisor Development was established in June 2025.

房喻院士出席清华大学化学系成立一百周年发展大会

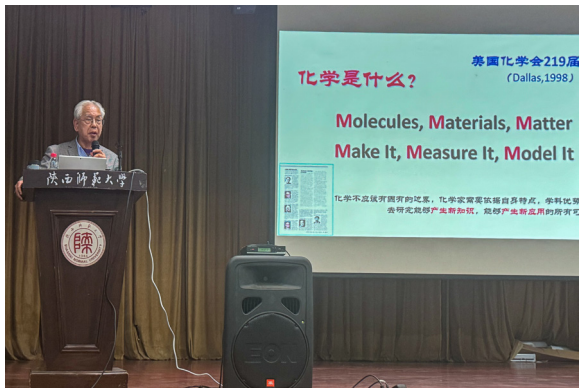
Fang Yu attends Centennial Development Conference of Department of Chemistry at Tsinghua University

2026 年 4 月 18 日，房喻院士应邀出席在清华大学新清华学堂举行的清华大学化学系成立一百周年发展大会。

On April 18, 2026, Prof. Fang Yu was invited to attend the Centennial Development Conference of the Department of Chemistry at Tsinghua University, held at the New Tsinghua Auditorium on the Tsinghua University campus.

房喻院士做客“致知大讲堂”作报告

Fang Yu delivers lecture at “Zhizhi Lecture Series”



2026 年 4 月 19 日晚，房喻院士应邀做客陕西师范大学化学化工学院“致知大讲堂”，为 2024 级、2025 级本科生作了题为《化学为什么要学》的专题讲座。

房喻院士结合近期学术活动与数十年科研教育经历，分享了他对“化学是什么、化学的发展、化学的作用”的见解。报告最后，房喻院士向青年学生提出两点期望：一要树立宏大志向，锻造坚韧品格，以坚韧不拔的精神将命运握于己手；二要厚植家国情怀，强化责任担当，以德才兼备为立身之本，以严谨缜密为行事之要。房喻院士还解答了同学们关切的问题并与大家合影留念。

On the evening of April 19, 2026, Prof. Fang Yu was invited to speak at the School of Chemistry and Chemical Engineering's "Zhizhi Lecture Series" at Shaanxi Normal University, where he delivered a lecture titled "Why Study Chemistry?" to undergraduate students from the classes of 2028 and 2029.

Drawing on recent academic activities and his decades of experience in research and education, Fang Yu shared his insights on "what chemistry is, the development of chemistry, and the role of chemistry". At the end of his talk, Fang Yu expressed two expectations for the young students: First, they should set lofty aspirations, cultivate a resilient character, and take control of their own destiny with an indomitable spirit; Second, they should cultivate a deep sense of patriotism and social responsibility, grounding themselves in both moral integrity and professional competence, and conducting themselves with rigor and meticulousness. Fang Yu also answered questions from the students and posed for a group photo with them.

刘凯强教授参加第十二届超分子新物质研讨会并作报告

Liu Kaiqiang presents at 12th Symposium on New Supramolecular Materials

2026 年 4 月 17 日至 19 日，陕西师范大学新概念传感器与分子材料研究院刘凯强教授应邀参加了由西北师范大学主办的第十二届超分子新物质研讨会，并作了题为"极端条件下的高效界面黏附"的邀请报告。

From April 17 to 19, 2026, Prof. Liu Kaiqiang from the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University attended the 12th Symposium on New Supramolecular Materials, hosted by Northwest Normal University, where he presented an invited report titled "High-Efficiency Interfacial Adhesion under Extreme Conditions".

刘忠山副教授参加 2026 年中国化学快报分析化学前沿学术研讨会并作报告

Liu Zhongshan presents at 2026 Chinese Chemical Letters Symposium on Frontiers in Analytical Chemistry

2026 年 4 月 17 日至 20 日，陕西师范大学新概念传感器与分子材料研究院刘忠山副教授参加了在江西赣州举办的"2026 年中国化学快报分析化学前沿学术研讨会"，并作题为"毒物微分离检测系统"的口头报告，介绍了近年来课题组在新型分离传感材料及微分离检测系统方面取得的研究进展。

From April 17 to 20, 2026, Assoc. Prof. Liu Zhongshan from the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University attended the 2026 China Chemical Letters Symposium on Frontiers in Analytical Chemistry held in Ganzhou, Jiangxi Province, where he presented an oral report titled "Miniaturized Separation-Detection System for Toxicants", outlining the research progress his research group has made in recent years regarding novel separation and sensing materials and miniaturized separation-detection system.

陕西省新概念传感器及分子材料重点实验室举行青年学者交流会

Shaanxi Provincial Key Laboratory of New Concept Sensors and Molecular Materials hosts Young Scholars Exchange Forum

2026 年 4 月 20 日，陕西省新概念传感器及分子材料重点实验室首届青年学者交流会在陕西师范大学新概念传感器与分子材料研究院报告厅举行。陕西师范大学房喻院士、化学化工学院院长刘成辉教授，西安交通大学科学与技术研究院副院长陈娟教授，西交大前沿科学技术研究院党委书记赵卫滨、副院长何刚教授，西交大新概念传感器与分子材料研究院执行院长刘峰教授，以及重点实验室教师、研发工程师和研究生代表等近百人参加会议。论坛开幕式由陕师大新概念传感器与分子材料研究院副院长丁立平教授主持。

开幕式上，刘成辉教授和陈娟教授分别致辞，对与会专家、青年教师和研究生表示欢迎，并对论坛的举办表示祝贺。

论坛报告环节中，来自西交大和陕师大的五位青年教师围绕各自研究方向作了学术报告。西交大肖雨欣博士、宋鑫博士、吴思凡博士分别作了题为“有机智能响应材料的设计制备及性能研究”“X 射线探测材料开发与应用”“毫米波天线与器件集成设计研究”的报告；陕师大林思敏博士、翟宾宾博士分别作了题为“多孔荧光分子材料的构筑、光物理性质和功能应用”“基于界面聚合纳米膜构建面向不同传感模式的功能材料”的报告。其间，与会专家和师生围绕分子材料设计、器件集成、传感机制和交叉合作等问题进行了交流。

闭幕式上，房喻院士作总结讲话。他肯定了本次青年论坛的组织成效和青年教师的报告质量，指出青年人才是重点实验室持续发展的重要力量，也是推动新概念传感器及分子材料领域创新突破的关键支撑。房喻院士希望青年教师进一步凝练科学问题，突出研究特色，强化交叉融合意识，努力形成具有辨识度和影响力的研究方向。他强调，重点实验室要持续搭建高水平学术交流平台，完善青年人才培养机制，促进多学科、多团队之间的深度合作，为实验室建设和学科发展注入新的活力。


陕西省新概念传感器及分子材料重点实验室
青年学者交流会
开幕式
陕西·西安
2026年4月20日


青年学者交流会
开幕式
陕西·西安
2026年4月20日


青年学者交流会
开幕式
陕西·西安
2026年4月20日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2016.9-2020.6
陕西师范大学
02
2020.9-2025.12
西北工业大学
柔性电子研究院
硕博连读


SHAANXI NORMAL UNIVERSITY
汇 报 人：林思敏
合作导师：房 喻 教授
日 期：2026年04月20日


X射线探测材料开发与应用
宋 鑫
特聘研究员
西安交通大学前沿院


汇 报 人：翟宾宾
合作导师：房 喻 教授
日 期 ：2026年4月20日


青年学者交流会
吴思凡
电磁与信息技术研究所
西安交通大学

本次论坛由应用表面与胶体化学教育部重点实验室、陕西省新概念传感器及分子材料重点实验室、西安市化生核放智能感知重点实验室、陕西师范大学化学化工学院和西安交通大学新概念传感器与分子材料研究院联合主办。

On April 20, 2026, the first Young Scholars Exchange Forum of the Shaanxi Provincial Key Laboratory of New Concept Sensors and Molecular Materials was held in the lecture hall of the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University. Nearly

100 attendees were present, including Prof. Fang Yu and Prof. Liu Chenghui, dean of the School of Chemistry and Chemical Engineering of Shaanxi Normal University; Prof. Chen Juan, vice dean of Institute of Science and Technology at Xi'an Jiaotong University; Zhao Weibin, party secretary and Prof. He Gang, vice dean of XJTU Frontier Institute of Science and Technology; Prof. Liu Feng, executive dean of XJTU Institute of New Concept Sensors and Molecular Materials; as well as faculty members, R&D engineers, and graduate students from the Key Laboratory. The opening ceremony was presided over by Prof. Ding Liping, vice dean of SNNU Institute of New Concept Sensors and Molecular Materials.

At the opening ceremony, Liu Chenghui and Chen Juan delivered speeches, welcoming the attending experts, young faculty members, and graduate students, and offered their congratulations on the forum's launch.

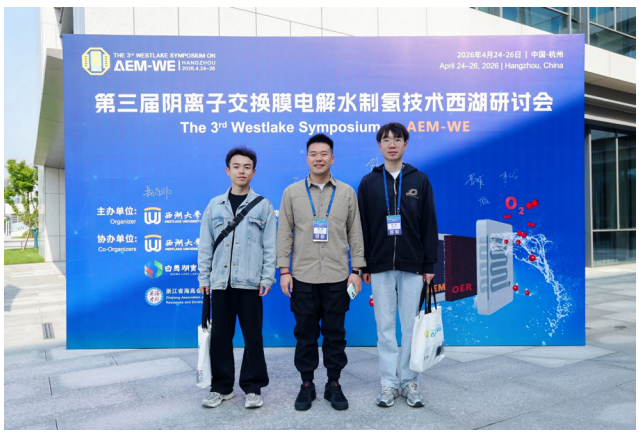
During the presentation session, five young XJTU and SNNU faculty members presented reports on their respective research areas. Dr. Xiao Yuxin, Dr. Song Xin, and Dr. Wu Sifan from XJTU presented reports titled "Design, Preparation, and Performance Study of Organic Smart Responsive Materials", "Development and Application of X-ray Detection Materials", and "Integrated Design Research on Millimeter-Wave Antennas and Devices", respectively; Dr. Lin Simin and Dr. Zhai Binbin from SNNU presented reports titled "Synthesis, Photophysical Properties, and Functional Applications of Porous Fluorescent Molecular Materials" and "Functional Materials for Different Sensing Modes Based on Interfacial Polymerized Nanomembranes", respectively. During the session, attending experts, faculty, and students engaged in discussions on topics including molecular material design, device integration, sensing mechanisms, and interdisciplinary collaboration.

At the closing ceremony, Fang Yu delivered a concluding address. He commended the organizational success of this forum and the quality of the presentations by the young scholars, noting that young talent is a vital force for the sustainable development of the Key Laboratory and a key pillar for driving innovative breakthroughs in the fields of new concept sensors and molecular materials. Fang Yu encouraged young scholars to further refine their scientific questions, highlight the distinctive features of their research, strengthen their awareness of interdisciplinary integration, and strive to establish research directions with distinctiveness and influence. He emphasized that the Key Laboratory must continue to build high-level academic exchange platforms, improve mechanisms for cultivating young talent, and promote in-depth collaboration across disciplines and teams to inject new vitality into the laboratory's development and the advancement of the discipline.

This forum is jointly organized by the Key Laboratory of Applied Surface and Colloid Chemistry (Ministry of Education), Shaanxi Provincial Key Laboratory of New Concept Sensors and Molecular Materials, Xi'an Municipal Key Laboratory of Intelligent Sensing for Chemical, Biological, Nuclear and Radioactive, SNNU School of Chemistry and Chemical Engineering, and XJTU Institute of New Concept Sensors and Molecular Materials.

薄鑫及学生参加第三届阴离子交换膜电解水制氢技术西湖研讨会

Bo Xin and his students attend 3rd Westlake Symposium on AEM-WE



2026 年 4 月 24 至 26 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及团队学生参加了在杭州举行的第三届阴离子交换膜电解水制氢技术西湖研讨会。

From April 24 to 26, 2026, Assoc. Prof. Bo Xin and his students from the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University attended the 3rd Westlake Symposium on Anion-Exchange Membrane Bo Xin and his students attended the 3rd West Lake Symposium on AEM-WE (Hydrogen Production via Anion-Exchange Membrane Water Electrolysis), held in Hangzhou.

Angewandte International Edition Chemie

GDCh German Chemical Society

RESEARCH ARTICLE | Full Access

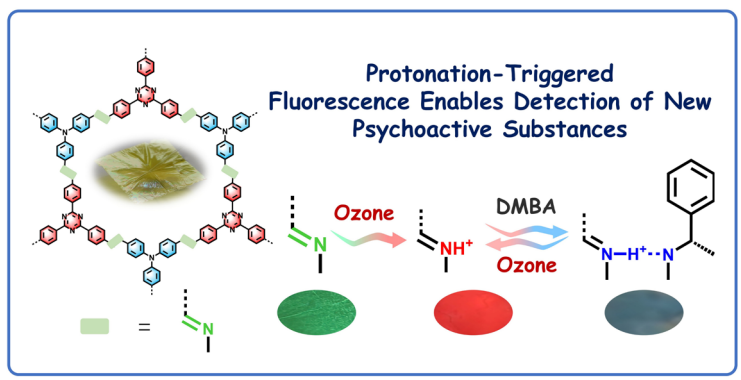
Protonation-Triggered Fluorescence Switching in COF Membranes for the Selective and Rapid Detection of New Psychoactive Substances

Yan Luo, Lejie Liu, Qingtong Wu, Hongtao Li, Ruijuan Wen, Jinglun Yang, Chun Yang, Yangtao Shao, Ling-Ya Peng ✉, Liping Ding ✉, Yu Fang ✉

First published: 16 April 2026 | https://doi.org/10.1002/anie.5244392 | VIEW METRICS

质子化触发的荧光开关在 COF 膜实现选择性和快速检测新精神活性物质

Yan Luo, Lejie Liu, Qingtong Wu, Hongtao Li, Ruijuan Wen, Jinglun Yang, Chun Yang, Yangtao Shao, Ling-Ya Peng*, Liping Ding*, Yu Fang*. Angew. Chem. Int. Ed., 2026, doi.org/10.1002/anie.5244392



新型精神活性物质（NPS）因其结构多样、演变迅速、隐蔽性强，已成为日益严重的公共安全威胁，迫切需要快速、灵敏、便携的现场检测方法。荧光传感因操作简单、灵敏度高、可视觉读出的优势而备受关注，但 NPS 在气相中饱和蒸汽压低，且易受水汽、CO_2 等干扰，实现高性能气相检测极具挑战。薄膜荧光传感器便于集成，但其结构有序性、活性位点均匀性和稳定性往往不足。共价有机框架（COF）具有可设计结构、有序孔道和可调光电性质，是理想的膜基传感平台，然而高质量 COF 膜的制备及其在 NPS 检测中的应用仍鲜有报道。本文通过界面限域聚合结合后处理，制备了 TTPA TFPA COF 自支撑膜。经臭氧处理后，该膜对 NPS 模拟物 (S) N, α 二甲基苄胺（DMBA）表现出快速（<1 min）、高选择性（可区分 7 种结构类似 NPS 标准品）、超低检测限（2.1 ppb）的荧光和比色双模式响应。机理研究表明，臭氧诱导亚胺键质子化，随后 DMBA 与质子化位点形成氢键，引发荧光红 蓝可逆切换。该工作为便携式、实时 NPS 痕量检测提供了新策略。

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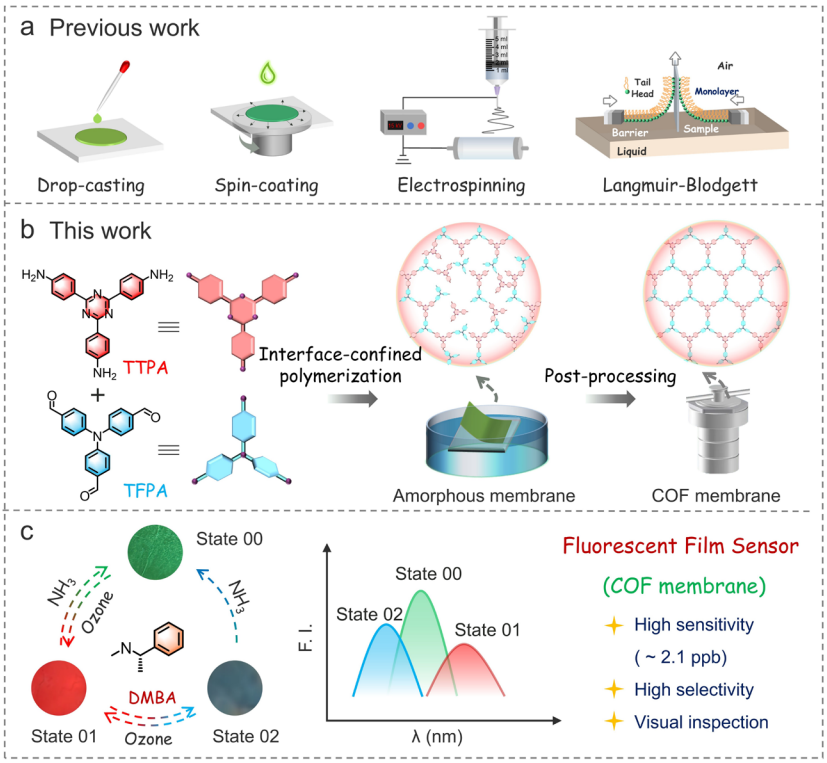

图 1. (a) 荧光传感薄膜的代表性制备方法；(b) TTPA 和 TFPA 的结构，以及 TTPA−TFPA COF 膜制备过程的示意图；(c) TTPA−TFPA COF 膜对臭氧、DMBA 和 NH_3 响应的示意图。

Figure 1. (a) Representative methods for the preparation of fluorescent sensing films; (b) Structures of TTPA and TFPA, along with a schematic illustration of the preparation process for TTPA–TFPA COF membrane; (c) Schematic illustration of the response of TTPA–TFPA COF membrane to ozone, DMBA, and NH_3.

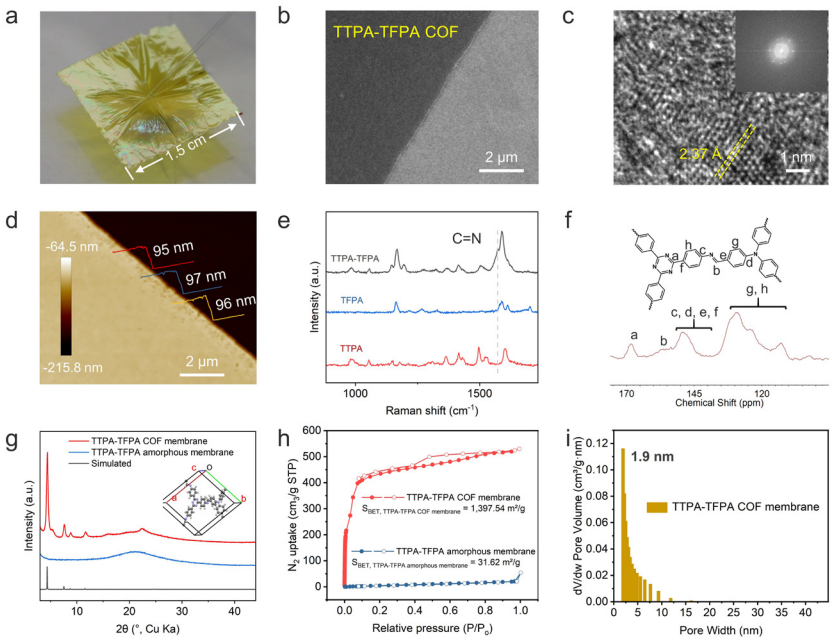

图 2. TTPA−TFPA COF 膜的表征与图像。

Figure 2. Images and characterization of the TTPA–TFPA COF membrane.

New psychoactive substances (NPS) typically exhibit low saturated vapor concentrations and are susceptible to interference such as water vapor and carbon dioxide, making the realization of high-performance gas-phase detection a challenge in both scientific research and public safety. Herein, we presented a self-standing covalent organic framework (COF) membrane formed between 1,3,5-tris-(4-aminophenyl) triazine (TTPA) and 4,4',4''-nitrilotribenzaldehyde (TFPA), TTPA–TFPA COF, which was fabricated via a two-step synthesis involving interface-confined polymerization followed by post-processing. The sensor used the ozone-treated COF membrane as the sensing layer exhibited rapid, highly selective, and visually observable fluorescence response toward the NPS simulant (S)-N,α-dimethylbenzylamine (DMBA), achieving a fast response time of less than 1 min and an ultra-low detection limit of 2.1 ppb. Moreover, the sensor successfully discriminates seven structurally analogous NPS reference standards through kinetic response profiling. The infrared and XPS spectra, along with theoretical calculations, further reveal the sensing mechanism is driven by hydrogen bond interaction between the ozone-treated COF membrane and the DMBA. These findings offer valuable insights for developing portable, real-time chemical monitoring devices, providing an innovative solution for on-site trace-level NPS detection. This holds promising potential for addressing serious threats to human health, family harmony, and social stability.

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Helical Linker as a Conformational Editor: Differential Locking of AIEgens for Tailored Luminescence and Circularly Polarized Light

Jing Li, Xubin Wang, Jiahai Chen, Zhouyu Chen, Simin Lin, Rong Miao and Yu Fang

Online publication date: 7 Apr 2026

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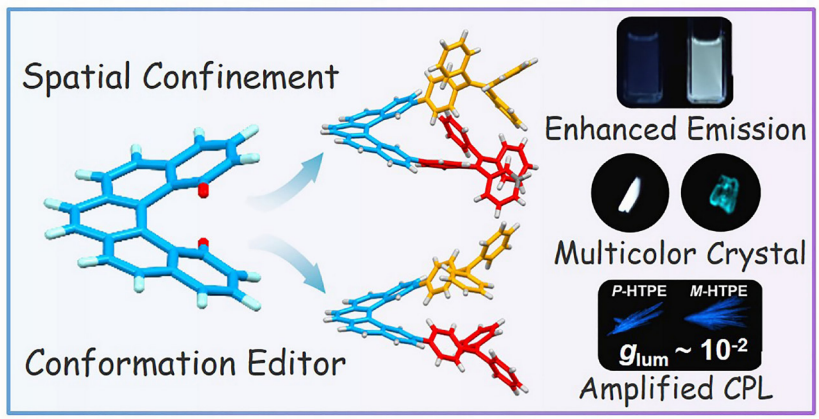
螺旋连接基作为构象编辑器：通过对聚集诱导发光分子进行差异化锁定实现可调控发光与圆偏振光

Jing Li#, Xubin Wang#, Jiahai Chen, Zhouyu Chen, Simin Lin, Rong Miao* and Yu Fang*. CCS Chem. 2026, DOI: 10.31635/ccschem.026.202607606



有机发光材料的性能与分子构象、分子内运动以及固态堆积方式密切相关。尤其对于聚集诱导发光（AIE）体系而言，如何有效限制分子内旋转、振动等非辐射衰减过程，是提升发光效率和实现性能调控的关键。二聚体体系因其结构明确、便于研究发色团间相互作用，已成为探究构象—性能关系的重要模型。然而，传统柔性链、刚性芳基或大环连接基虽然能够在一定程度上调节发色团间距与耦合方式，却往往难以实现精确的三维构象控制。相比之下，[5]螺烯兼具刚性、手性和显著空间位阻，不仅可作为连接单元，还可能充当“构象编辑器”，为发光与手性光学性质的协同调控提供新的分子设计策略。

本文以刚性手性[5]螺烯作为“构象编辑器”，构建了连接四苯乙烯（TPE）和三苯胺（TPA）发光单元的二聚体 HTPE 与 HTPA，旨在通过空间限域精确调控 AIE 分子的构象与发光行为。研究表明，[5]螺烯不仅是简单连接基，还能显著限制分子内运动，使二者在溶液中的荧光大幅增强：HTPE 相较 TPE 提升约 47 倍，HTPA 相较 TPA 提升约 154 倍。同时，螺烯提供的三维限域环境对不同体积发光单元产生差异化锁定作用：体积较大的 TPE 在 HTPE 中倾向形成不对称构象，而较小的 TPA 在 HTPA 中则保持对称构象。单晶结构与理论计算进一步证明，HTPE 的不对称构象在热力学上更稳定，这种构象锁定使其形成不同晶型，并表现出可调荧光发射。进一步地，HTPE 凭借螺烯赋予的手性，在晶体、聚集态及掺杂薄膜中均表现出明显的圆二色性和圆偏振发光，晶体态的 g_{lum} 达到 10^{-2} 数量级。此外，HTPE 还可作为手性供体，通过 C–FRET 策略将能量与手性传递给罗丹明 B 等受体染料，实现多色圆偏振发光。该工作为利用螺旋连接基精准调控多发色团体系的荧光与手性光学性质提供了新思路。

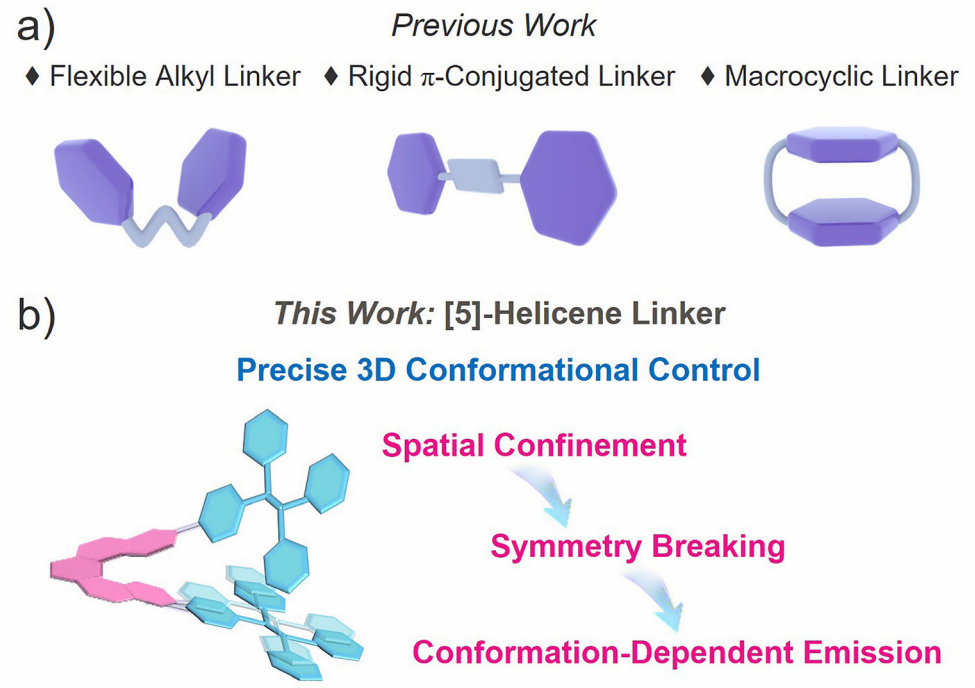


图 1. 传统基于连接子的二聚体设计策略（a）与本文提出的空间限制驱动的结构对称性破缺策略（b）的示意图对比。

Figure 1. Schematic comparison of traditional linker-based dimer design strategies (a) with the spatial-confinement-driven structural symmetry-breaking strategy introduced in this work (b).

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The photophysical properties of organic luminescent materials are strongly influenced by molecular conformation, intramolecular motion, and solid-state packing. In aggregation-induced emission (AIE) systems, restricting intramolecular rotations and vibrations is particularly important because it helps suppress nonradiative decay and improve emission efficiency. Dimeric systems, with their well-defined structures and clear interchromophore interactions, have therefore been widely used as model systems for understanding conformation-property relationships. However, conventional linkers, such as flexible chains, rigid aryl groups, and macrocycles, can only partially regulate chromophore distance and coupling, and often do not provide sufficient control over three-dimensional molecular conformation. In this context, [5]helicene is especially attractive because of its rigid, chiral, and sterically demanding structure. It can act not only as a linker, but also as a conformational editor, offering a useful strategy for tuning both luminescence and chiroptical properties.

In this work, a rigid chiral [5] helicene unit was used to construct two dimers, HTPE and HTPA, containing tetraphenylethylene (TPE) and triphenylamine (TPA), respectively. The purpose was to regulate the conformation and luminescence behavior of AIE-active molecules through spatial confinement. The results show that [5] helicene does more than simply connect two luminophores. By restricting intramolecular motion, it greatly enhances fluorescence in solution: HTPE is 47 times more emissive than TPE, while HTPA shows a 154-fold enhancement compared with TPA. At the same time, the confined three-dimensional environment created by the helicene linker leads to different locking effects for luminophores of different sizes. In HTPE, the bulkier TPE units favor an asymmetric conformation, whereas in HTPA, the smaller TPA units adopt a symmetric arrangement. Single-crystal analysis and theoretical calculations further show that the asymmetric conformation of HTPE is thermodynamically preferred. This conformational locking also gives rise to different polymorphs with tunable fluorescence. In addition, the chirality of the helicene unit endows HTPE with clear circular dichroism and circularly polarized luminescence in crystals, aggregates, and doped films, with a glum value reaching the 10-2 level in the crystalline state. HTPE can also serve as a chiral donor in a circularly polarized Förster resonance energy transfer (*C*-FRET) process, transferring both energy and chirality to acceptor dyes such as rhodamine B and thereby enabling multicolor circularly polarized luminescence. Overall, this work provides a useful approach for regulating the fluorescence and chiroptical properties of multichromophoric systems through helical linkers.

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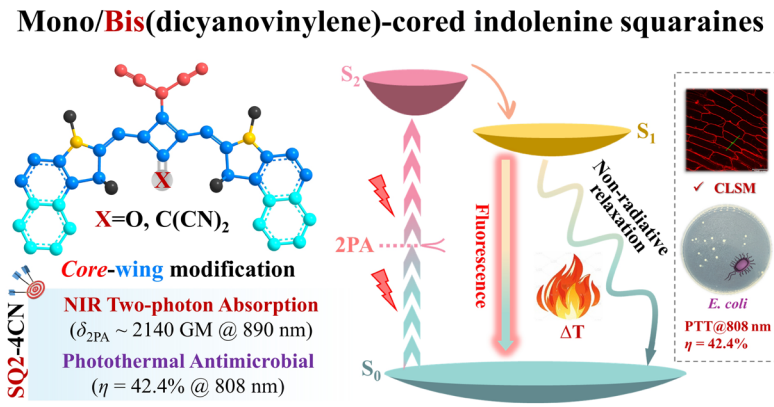
From the journal:
Chemical Science

Core-wing modulated squaraines with enhanced two-photon absorption and efficient photothermal eradication of bacteria

Xin-Ao Liu, Xingtong Zhou, Tong Zhang, Congdi Shang, Liping Ding, Taihong Liu and Yu Fang

核翼调制方酸菁染料：增强双光子吸收性能与高效光热抗菌

Xin-Ao Liu, Xingtong Zhou, Tong Zhang, Congdi Shang, Liping Ding, Taihong Liu and Yu Fang. Chem. Sci., 2026, https://doi.org/10.1039/D6SC00573J



生物成像引导的光热治疗与诊断技术发展迅速，其精准性与有效性依赖于发色团和光热诊疗剂的光物理性质。在近红外发色团中，方酸菁染料因吸收带尖锐、摩尔消光系数高、光稳定性好及强双光子吸收特性而备受关注。通过 π－共轭延伸和 D–π–A 增强策略，引入亲核杂环取代基可构建多样的“两翼”结构，优化光学性能。相较于广泛研究的给电子端基结构修饰，针对方酸菁核心的功能修饰研究较少。因此，开展“核－翼”协同修饰及其结构变化研究，是开发高性能近红外发色团与光热诊疗试剂的重要方向。

本研究通过“核－翼”调制策略，合成了两系列方酸菁染料：吲哚啉翼 SQ1 与苯并吲哚啉翼 SQ2 衍生物，主要差异在于同一系列内的“核”结构变化和不同系列间的“翼”结构变化。随着方酸菁核心被二氰基亚乙烯基逐步取代，染料光学带隙减小，发射波长显著红移。双（二氰基亚乙烯基）修饰的方酸菁衍生物表现出高阶吸收带、强分子内电荷转移（ICT）、高非辐射衰减速率及弯曲分子骨架等特性。其中，SQ2–4CN 染料在 890 nm 处具有 2140 GM 的双光子吸收截面，归因于高跃迁偶极矩、较小重整能和对称性诱导的宇称选择规则。理论计算表

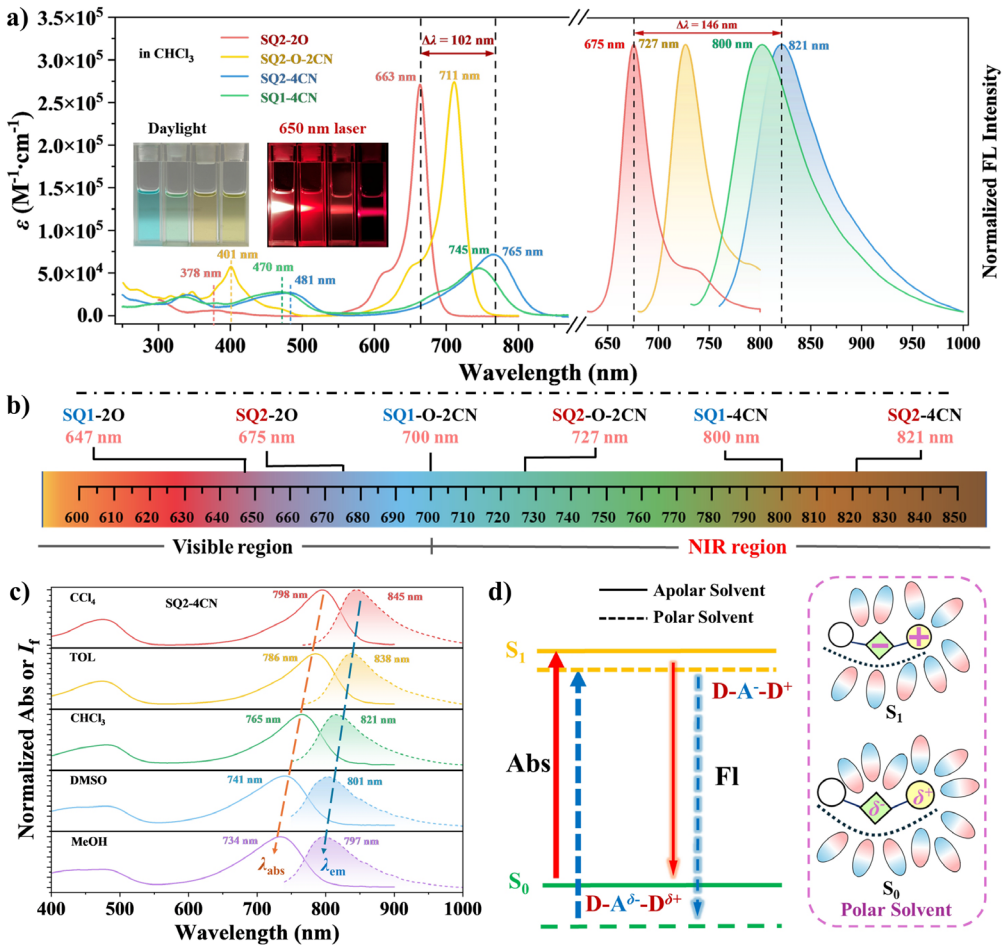


图 1. (a) SQ2 系列三种化合物与 SQ1−4CN 在 CHCl3 溶液中的稳态光谱；(b) 系列 SQs 在 $CHCl_3$ 中的荧光发射峰分布；(c) SQ2−4CN 在不同有机溶剂中的归一化吸收（实线）和发射（虚线）光谱；(d) 溶剂极性对 SQ2−4CN 光激发过程的影响示意图。

Figure 1. (a) Steady-state spectra of the SQ2 series and SQ1-4CN in CHCl3 solution. (b) Fluorescence peak distribution of SQs in $CHCl_3$. (c) Normalized absorption (solid lines) and emission (dashed lines) spectra of SQ2-4CN in different organic solvents. (d) Schematic illustration of the effect of solvent polarity on the photoexcitation process of SQ2-4CN.

明，弯曲分子几何构型与增强 ICT 是决定稳态光学和双光子吸收效率的关键。瞬态吸收光谱揭示不同核修饰显著影响激发态行为，并阐明溶剂依赖行为与核 / 翼修饰之间的关联。SQ2–4CN 的 D–A–D 结构允许激发态发生弯曲 ICT，降低激发态极性，在极性溶剂中产生反常的荧光蓝移，与平面型方酸菁的趋势相反。

最后使用洋葱表皮细胞模型对代表性染料 SQ2–4CN 的生物成像功能进行了评估，其在 808 nm 激光照射下的光热转换效率为 42.4%，表现出通过光热消融实现抗菌活性的良好潜力。该工作为多功能方酸菁的理性设计和先进光电应用提供了思考。

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Predictable structure-property relationships for the near-infrared (NIR)-emitting chromophores and sustainable photothermal agents remain challenging. Herein, two series of indolenine-based squaraines are synthesized to investigate the core-wing structural modulation corresponding to the photophysical properties. Dicyanovinylene modification on the squaraine carbonyl core induces substantial bathochromic shift and enriches the de-activation pathways,

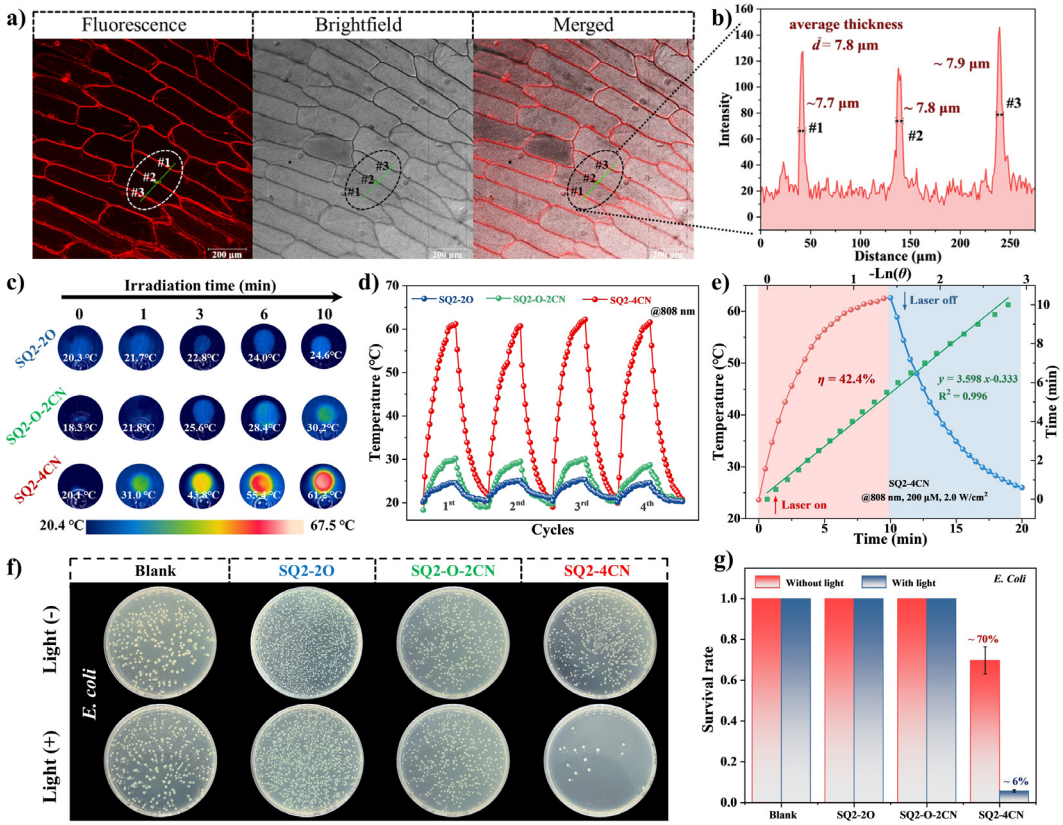

图 2. (a) 与 SQ2−4CN 共孵育的洋葱表皮细胞的 CLSM 图像；(b) SQ2−4CN 染色的洋葱表皮细胞的光谱强度分析； (c) SQ2 系列在 DMSO 溶液中不同时间点激光照射下的红外热成像图；(d) SQ2 系列经四次照射 / 冷却循环（808 nm, 1.5 W/cm2, 10 分钟）的温度变化；(e) 升温 / 降温曲线及降温时间与 −ln(θ) 的关系图；(f) SQ2 系列存在时对大肠杆菌菌落可视化效果比较；(g) 808 nm 激光照射下与 SQ2s 共培养的大肠杆菌的存活率。

Figure 2. (a) CLSM images of onion epidermal cells incubated with SQ2-4CN. (b) Spectral intensity analysis of onion epidermal cells stained with SQ2-4CN. (c) Infrared thermographic images of the SQ2 series in DMSO solution under laser irradiation at different time points. (d) Temperature variation of the SQ2 series over four irradiation/cooling cycles (808 nm, 1.5 W/cm2, 10 min). (e) Heating/cooling curves and the plot of cooling time versus -ln(θ). (f) Comparison of the visualization effect on E. coli colonies in the presence of the SQ2 series. (g) Survival rate of E. coli co-cultured with the SQ2s under 808 nm laser irradiation.

while further wing functionalization strengthens the intramolecular charge transfer (ICT) efficiency and enhances the nonlinear two-photon absorption (2PA). Intrinsic zwitterionic stabilization and bent-shaped molecular skeleton of the bis(dicyanovinylene)-cored squaraines are accompanied theoretically. Optimal benzindolenine-winged squaraine dye SQ2-4CN demonstrates a strong two-photon absorption cross section (δ2PA) of 2140 GM at 890 nm within the NIR biological spectral window, approximately 8.95-fold enhancement over that of the indolenine-winged counterpart SQ1-2O. Femtosecond transient absorption spectroscopies further reveal the ICT character and plausible excited-state dynamics. Moreover, efficient bio-staining capability and photothermal eradication of bacteria with a significant photothermal conversion efficiency of 42.4% under 808 nm laser irradiation are initially validated for SQ2-4CN. The present work opens a pathway for designing core/wing-modified squaraines with superior nonlinear optical properties for potential bioimaging and photothermal applications.

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analytical chemistry

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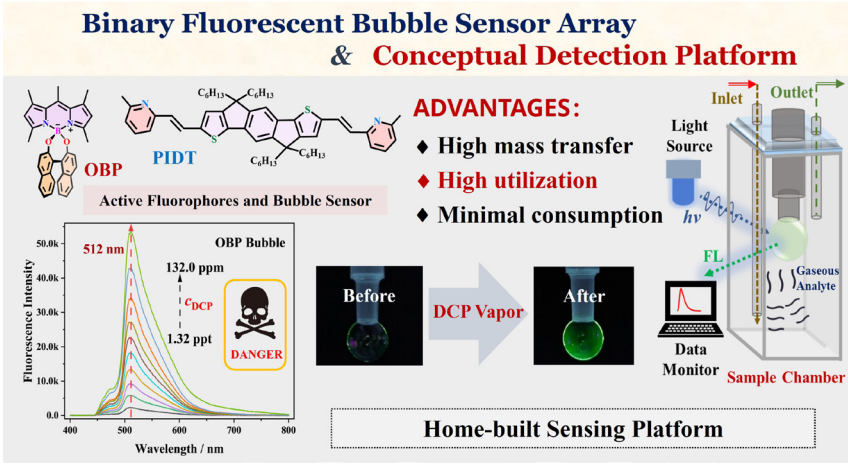
Fluorescent Bubble Sensor Array and a Conceptual Platform for High-Performance Sensing of Gaseous Nerve Agent Simulants

Wendan Luo, Yijia Chen, Jinghua Yu, Chun Yang,* Zhiyan Huang, Taihong Liu,* Liping Ding, and Yu Fang

Cite This: https://doi.org/10.1021/acs.analchem.6c00915 Read Online

荧光气泡传感器阵列构建及气相神经性毒剂模拟物高效检测

Wendan Luo, Yijia Chen, Jinghua Yu, Chun Yang*, Zhiyan Huang, Taihong Liu*, Liping Ding, and Yu Fang. Anal. Chem., 2026, DOI: https://doi.org/10.1021/acs.analchem.6c00915



荧光气泡传感器和微液滴反应器凭借其传质效率高、比表面积大和活性物质利用高效等固有优势，近年来在快速检测领域备受关注。本文首次提出了荧光气泡传感器阵列策略，成功构建出可灵敏检测气相神经性毒剂模拟物 DCP 的小型化荧光气泡传感平台。该研究设计并合成了两种荧光活性物质 OBP 和 PIDT，初步评估了其在溶液相对 DCP 的传感性能和相关传感机制。随后，将两种荧光活性物质 OBP 和 PIDT 掺杂至由十二烷基苯磺酸钠 SDBS、甘油与水优化复配而成前驱体气泡溶液中，制备出两种气泡传感器。优化后的气泡具备更长的使用寿命与更强的稳定性，满足后续检测应用需求。进一步搭建了基于荧光气泡传感器的小型化传感平台，系统探究了该传感平台对气态 DCP 及其酸性干扰物的快速开启型传感响应。与微液滴中的均相检测相比，荧光气泡传感器展现出显著的 24.9 倍信号放大能力，可检测到浓度低至 1.32 ppt 的气相 DCP；该高灵敏度可基于质量传递动力学与连续相转移过程进行理论阐释。后续二元组分复合气泡传感器可有效提升检测性能，实现 DCP 与酸性干扰物的精准区分，契合当前便携式设备集成化检测危险物质的发展趋势。

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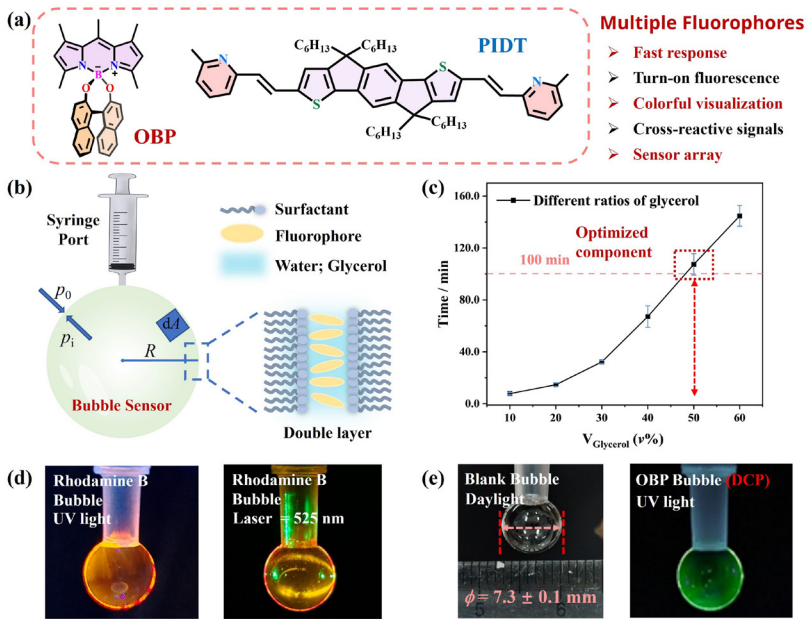

图 1. 活性荧光物质 OBP 和 PIDT 的分子式及气泡结构示意图及照片图像

Figure 1. Molecular formulas of the two active fluorophores OBP and PIDT; Schematic diagram and photographic images of the bubble structures.

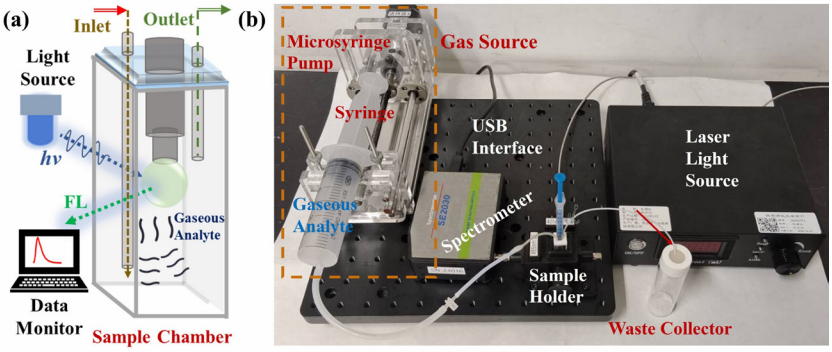

图 2. 气泡传感器的样品腔示意图及自搭建气泡传感平台的实物照片

Figure 2. Schematic sample chamber containing the bubble sensor and gaseous analyte; Photograph of the home-built bubble sensing platform.

The development of a reliable platform for rapid and sensitive detection of hazardous substances has always been a core research direction in the fields of public security, environmental monitoring, and anti-terrorism and chemical defense. Fluorescent Bubble Sensor and droplet microreactors have attracted extensive attention in the field of rapid detection in recent years due to their inherent advantages such as high mass transfer efficiency, large surface area-to-volume ratio, and efficient utilization of active substances. Herein, two active fluorophores based on the 4,4-diaryloxy BODIPY derivative (abbreviated as OBP) and 4,4,9,9-tetrahexyl-4,9-dihydro-s-indaceno[1,2-b:5,6-b']dithiophene pyridine derivative (PIDT) were synthesized and fully characterized. Their sensing performance and related sensing mechanisms in the solution media for diethylchlorophosphate (DCP), a typical nerve agent simulant, were initially evaluated with the aid of theoretical calculations. Subsequently, two corresponding bubble sensors were optimized by doping the two fluorophores (OBP and PIDT) into the stock bubble solution. The components in the latter stock bubble solution were optimized as the mixtures of sodium dodecylbenzene sulfonate (SDBS), glycerol, and water. The life span and robustness of the optimal bubbles suite for the further detection application. A compact sensing platform based on the optical bubble sensors was further fabricated for evaluating the detection of gaseous DCP and acid interferents. Fast turn-on sensing response targeting gaseous DCP was investigated properly. Compared with homogeneous detection in droplets, the fluorescent bubble sensor exhibits a significant 24.9-fold signal amplification capability. It can detect gaseous DCP at a concentration as low as 1.32 ppt, with higher sensitivity than most reported optical sensors. Meanwhile, the underlying sensing mechanism of the fluorescent bubble sensor was theoretically explained through the mass transfer dynamics and sequential phase-transfer processes. Importantly, enhanced sensing performances and discrimination of DCP from the acid interferences were achieved properly based on a binary-component bubble sensor. This work first presents a bubble sensor array for detecting gaseous nerve agent simulants and fabricates a compact platform for evaluating sensing performances. This approach advances sustainable gas detection applications, and aligns with the emerging integration of portable devices for detecting hazardous substances.

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Nano Research

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Research Article

Multiscale-coupled triple-confinement engineering: fabrication and applications of high-efficiency long-lifetime room-temperature phosphorescent carbon dots

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多尺度耦合的三重限域工程：高效率长寿命室温磷光碳点的制备及应用

Kaixiang Cui, Keyu Xie, Haonan Peng*, Liping Ding*, Yu Fang. Nano Research, 2026, https://doi.org/10.26599/NR.2026.94908629

室温磷光（RTP）材料凭借长寿命、抗背景干扰等优势，在信息加密、防伪、生物成像与光电器件等领域中极具应用潜力。碳点（CDs）作为绿色无毒、易修饰的新型零维碳纳米材料，是发展无金属 RTP 体系的理想选择。然而，要实现 CDs 的高效、长寿命的室温磷光性能仍然具有极大的挑战性，原因在于：（1）弱的自旋－轨道耦合，这阻碍了从单重态到三重态状态的有效跃迁；（2）由分子振动和氧猝灭驱动的快速非辐射跃迁；以及（3）固态系统中的聚集诱导猝灭效应。将 CDs 嵌入到刚性基质中已被证实能够有效地限制分子运动并抑制非辐射跃迁。但传统单重限域策略难以同时兼顾系间窜越增强与非辐射衰减抑制，寿命与量子产率相互掣肘，成为 RTP 碳点走向实用的核心瓶颈。

基于上述挑战，本工作提出一种多尺度耦合三重限域策略，即同步融合分子级共价键锁定、纳米级 SiO_2 包覆、基质级 B_2O_3 刚性化，实现了高性能室温磷光碳点材料的制备。该设计有效解耦 ISC 增强与非辐射跃迁抑制的竞争关系，实现非线性协同增强，协同指数 S 为 2.4。复合材料表现出优异性能：磷光寿命达 1120 ms，量子产率 25.98%，较单一限域体系分别提升 3.8 倍与 1.7 倍。该策略具有良好普适性，适用于不同碳源与硅烷试剂体系。借助磷光共振能量转移（PRET），仅掺入 1% 商用染料即可实现多色室温磷光可调，突破传统碳点发光颜色限制。基于优异光学特性，该材料成功应用于秒级时间门控信息加密、高对比度指纹识别、无商业荧光粉暖白光 LED 等场景。本工作建立了多尺度耦合限域的通用设计原则，为高性能无金属室温磷光碳点的开发与应用提供了新路径。

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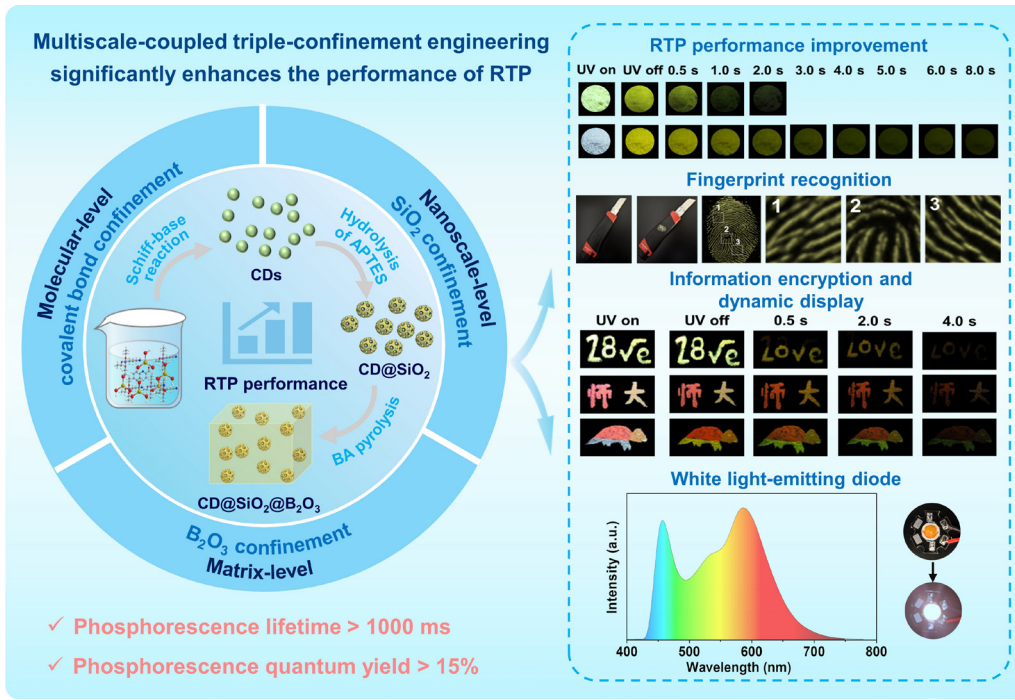
Room-temperature phosphorescence (RTP) materials possess advantages such as long lifetime and resistance to background interference, and thus have great potential for applications in information encryption, anti-counterfeiting, biological imaging, and optoelectronic devices. Carbon dots



(CDs), as a new type of zero-dimensional carbon nanomaterial that is green, non-toxic, and easily modifiable, are an ideal choice for developing metal-free RTP systems. However, achieving efficient and long-lived RTP properties of CDs still poses significant challenges. The reasons are as follows: (1) Weak spin-orbit coupling, which hinders the effective transition from the singlet state to the triplet state; (2) Rapid non-radiative transitions driven by molecular vibrations and oxygen quenching; and (3) Aggregation-induced quenching effect in solid-state systems. Embedding CDs into a rigid matrix has been proven to effectively limit molecular motion and suppress non-radiative transitions. However, traditional single-domain confinement strategies are difficult to simultaneously balance intermolecular hopping enhancement and non-radiative decay suppression, with lifetime and quantum yield being mutually restrictive, becoming the core bottleneck for RTP carbon dots to move towards practical applications.

In response to these challenges, this work proposes a multi-scale coupled triple confinement strategy, namely synchronous integration of molecular-level covalent bond locking, nanoscale SiO_2 coating, and matrix-level B_2O_3 rigidification, which enables the preparation of high-performance room-temperature phosphorescent carbon dot materials. This design effectively decouples the competition between ISC enhancement and non-radiative transition suppression, achieving nonlinear synergistic enhancement, with a synergy index S of 2.4. The composite material exhibits excellent performance: phosphorescence lifetime of 1120 ms, quantum yield of 25.98%, which are 3.8 times and 1.7 times higher than those of the single confinement system, respectively. This strategy has good universality and is applicable to different carbon sources and silane reagent systems. By means of phosphorescence resonance energy transfer (PRET), only 1% of commercial dyes can be incorporated to achieve multi-color room-temperature phosphorescence tunability, breaking the traditional limit of carbon dot emission colors. Based on its excellent optical properties, this material is successfully applied in second-level time-gated information encryption, high-contrast fingerprint recognition, and warm white LED without commercial fluorescent powder. This work establishes a general design principle of multi-scale coupled confinement, providing a new path for the development and application of high-performance metal-free room-temperature phosphorescent carbon dots.

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ADVANCED MATERIALS

RESEARCH ARTICLE | Full Access

Exciton-Photon Critical Coupling in Size-Tailored Quantum Dots Enables >22% Efficient and Stable Inverted $CsPbI_3$ Solar Cells

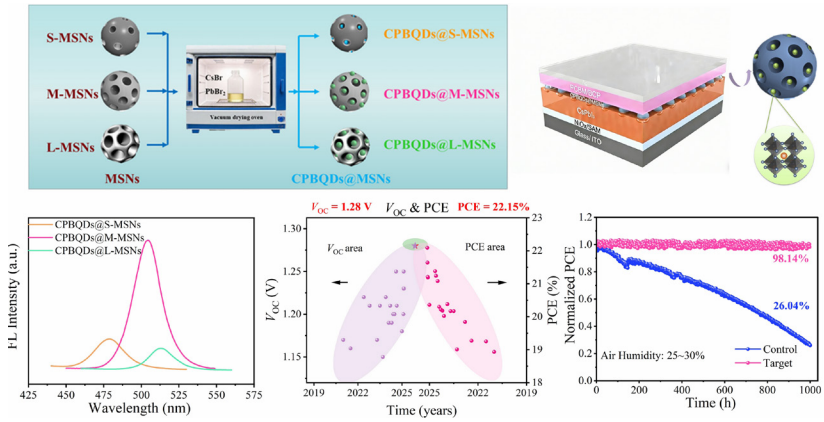
Dongfang Xu, Kaixiang Cui, Zihao Fan, Yong Li, Junjie Zhang, Yupeng Shang, Hanye Wang, Jieke Tan, Yongzhe Li, Hongjie Lei, Liping Ding ✉, Zhike Liu ✉

First published: 09 April 2026 | https://doi.org/10.1002/adma.73024 | VIEW METRICS

Dongfang Xu and Kaixiang Cui contributed equally to this work.

尺寸调控的量子点中激子 – 光子临界耦合实现效率超 22% 且性能稳定的倒置 CsPbI3 太阳能电池

Dongfang Xu, Kaixiang Cui, Zihao Fan, Yong Li, Junjie Zhang, Yupeng Shang, Hanye Wang, Jieke Tan, Yongzhe Li, Hongjie Lei, Liping Ding*, Zhike Liu*. Adv. Mater. 2026, e73024. DOI: 10.1002/adma.73024



全无机倒置 $CsPbI_3$ 钙钛矿太阳电池（PSCs）因其优异的热稳定性、可调带隙以及较高的光电转换效率（PCE），在光伏领域引起了广泛关注。然而，这类器件的性能与稳定性仍受到 $CsPbI_3$ 钙钛矿薄膜内在缺陷的严重限制。一方面，薄膜表面及晶界处高密度的缺陷态会作为非辐射复合中心，缩短载流子寿命，并显著降低开路电压（VOC）和填充因子（FF）。另一方面，由于钙钛矿层与电荷传输层之间能级匹配不佳以及界面电子态不均匀，往往导致电荷提取效率低下。

针对上述挑战，本工作提出了一种基于介孔二氧化硅（MSN）负载可调尺寸 $CsPbBr_3$ 量子点（CPBQDs@MSNs）的界面钝化策略。如图 1 所示，首先通过双相分层自组装法精确调控反应条件，可控制备了一系列具有不同孔径的 MSN。然后选用不同大小孔径的 MSN 作为纳米颗粒模板，利用纳米限域制备策略原位合成了具有不同尺寸大小的CPBQDs@MSNs复合材料。对制备的量子点复合材料的形貌和成分进行了详细表征，并系统研究了量子点尺寸对界面缺陷钝化、载流子动力学及器件性能的影响。

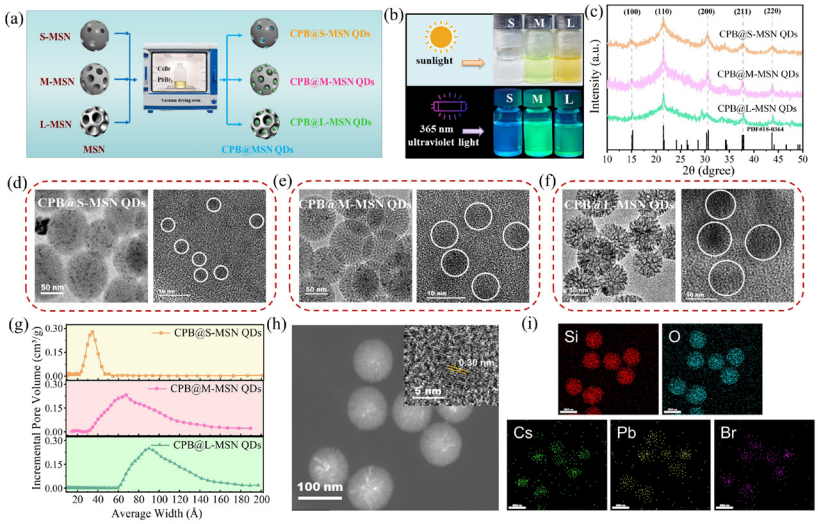


图 1. 基于纳米限域制备策略制备不同粒径量子点及其表征

Figure1. Preparation of quantum dots with different sizes via a nano-confinement strategy and their characterization

研究结果表明当 CPBQDs@M–MSNs（约 8 nm）的孔径与 $CsPbBr_3$ 的激子玻尔半径（约 7 nm）相匹配时，激子–光子临界耦合效应可实现对界面电子态的均匀调控，从而显著抑制非辐射复合及缺陷的热激活过程。此外，CPBQDs@M–MSNs 不仅能够填充钙钛矿表面及晶界缺陷，提高薄膜致密性和平整度，还可优化界面能级匹配、促进定向电荷传输，并构建起具有防潮作用的 SiO_2 框架。基于该策略制备的倒置 $CsPbI_3$ PSCs 实现了 22.15% 的 PCE，为目前报道的倒置 $CsPbI_3$ PSCs 的最高水平。此外，该器件在空气中储存 1300 h 后仍保持初始 PCE 的 93.16%，在持续光照 1000 h 后仍保持 98.14% 的初始效率。本工作为精准调控钙钛矿表面性质、实现高效率与高稳定性的全无机 $CsPbI_3$ 钙钛矿太阳电池提供了一种新的思路与方法。

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All-inorganic inverted $CsPbI_3$ perovskite solar cells (PSCs) have attracted significant attention in the field of photovoltaics due to their excellent thermal stability, tunable bandgap, and high photoelectric conversion efficiency (PCE). However, the performance and stability of these devices are still severely limited by the intrinsic defects of the $CsPbI_3$ perovskite films. On one hand, the high density of defect states at the film surface and at the grain boundaries act as non-radiative recombination centers, shortening the carrier lifetime and significantly reducing the open-circuit voltage (VOC) and fill factor (FF). On the other hand, due to the poor energy level matching between the perovskite layer and the charge transport layer, as well as the uneven interface electronic states, the charge extraction efficiency is often low.

To address these challenges, this work proposes an interface passivation strategy based on mesoporous silica (MSN) loaded with tunable-sized $CsPbBr_3$ quantum dots (CPBQDs@MSNs). As shown in Figure 1, first, the reaction conditions were precisely controlled through a biphasic layered self-assembly method to prepare a series of MSNs with different particle sizes and pore diameters. Then, MSNs with different pore diameters were selected as nanoparticle templates, and in situ synthesized CPBQDs@MSNs composites with different sizes were prepared using the nano-confined synthesis strategy. The morphology and composition of the prepared quantum dot composites were thoroughly characterized, and the influence of quantum dot size on interface defect passivation, carrier dynamics, and device performance was systematically studied.

The research results indicate that when the pore size of CPBQDs@M-MSNs (approximately 8 nm) matches the exciton Bohr radius of $CsPbBr_3$ (approximately 7 nm), the exciton-photon critical coupling effect can achieve uniform regulation of the interface electronic states, thereby significantly suppressing non-radiative recombination and the thermal activation process of defects. Moreover, CPBQDs@M-MSNs not only can fill the surface and grain boundary defects of the perovskite, improving the film density and flatness, but also can optimize the interface energy level matching, promote directional charge transport, and construct a moisture-proof SiO_2 framework. The inverted $CsPbI_3$ PSCs prepared based on this strategy achieved a PCE of 22.15%, which is the highest level reported for inverted CsPbI3 PSCs to date. Additionally, the device still maintained the initial PCE of 93.16% after being stored in air for 1300 hours, and still maintained an initial efficiency of 98.14% after continuous illumination for 1000 hours. This work provides a new idea and method for precisely regulating the surface properties of perovskites and achieving high efficiency and high stability of all-inorganic $CsPbI_3$ perovskite solar cells.

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佟振合院士参观研究院并做客“曲江讲坛”作报告

Academician Tong Zhenhe visits SNNU INCSMM and delivers report at the Qujiang Forum

2026 年 4 月 1 日下午，中国科学院理化技术研究所研究员、学术委员会名誉主任佟振合院士到访陕西师范大学新概念传感器与分子材料研究院，并在房喻院士陪同下参观了研究院展厅，了解研究院基本情况、发展理念、科研方向、技术优势、研究成果及战略布局等情况。

4 月 2 日上午，佟振合院士做客陕西师范大学“曲江讲坛”第 110 期，作题为“光化学是一门有用的科学——合成化学、能源科学、生命科学、信息科学环境科学及公共安全中的光化学”的专题报告。

报告中，佟振合院士从光化学的基本概念出发，指出光化学本质上是电子激发态化学，是研究由电子激发态引发的物理和化学过程的一门科学。随后，他阐述了光化学在合成化学中的应用，强调了其为绿色化学提供的强有力支撑可概括为“三少一多”：减少废物生成、减少能量消耗、减少有害物质，更多利用可再生资源。佟院士聚焦太阳能的利用，指出“中国是世界上太阳能电池生产和应用最大的国家”，通过多个案例讲解了人工光合作用，介绍了其团队在该领域的重要贡献。最后，他展示了光化学在环境、健康及公共安全中的发光传感器应用，讲解了大气光化学相关内容。

报告会由陕西师范大学研究生院（党委研究生工作部）主办，房喻院士主持，400 余名教师和研究生代表参加了报告会。

On April 1, 2026, Academician Tong Zhenhe, a researcher at the Institute of Physics and Chemistry of the Chinese Academy of Sciences and honorary director of its Academic Committee, visited the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University. Accompanied by Prof. Fang Yu, he toured the institute’s exhibition room and learned about its basic profile, development philosophy, research directions, technological strengths, research achievements, and strategic planning.

On the morning of April 2, Tong Zhenhe delivered a report titled “Photochemistry: A Useful Science — Photochemistry in Synthetic Chemistry, Energy Science, Life Sciences, Information Science, Environmental Science, and Public Safety” at the 110th session of SNNU “Qujiang Forum”.

In his report, Tong Zhenhe began with the basic concepts of photochemistry, noting that photochemistry is essentially

the chemistry of electronic excited states — a scientific discipline that studies the physical and chemical processes triggered by these states. He then elaborated on the applications of photochemistry in synthetic chemistry, emphasizing that its strong support for green chemistry can be summarized as "three reductions and one increase": reducing waste generation, reducing energy consumption, reducing the use of hazardous substances, and increasing the utilization of renewable resources. Focusing on the utilization of solar energy, Tong noted that "China is the world's largest producer and user of solar cells". He explained artificial photosynthesis through multiple case studies and introduced his team's significant contributions in this field. Finally, he demonstrated the application of photochemical luminescent sensors in the fields of the environment, health, and public safety, and discussed topics related to atmospheric photochemistry.

The report was organized by the Graduate School of Shaanxi Normal University and anchored by Prof. Fang Yu. More than 400 faculty members and graduate students attended the event.

新加坡南洋理工大学陈晓东教授参观研究院并作报告

Prof. Chen Xiaodong from Nanyang Technological University visits SNNU INCSMM and delivers report

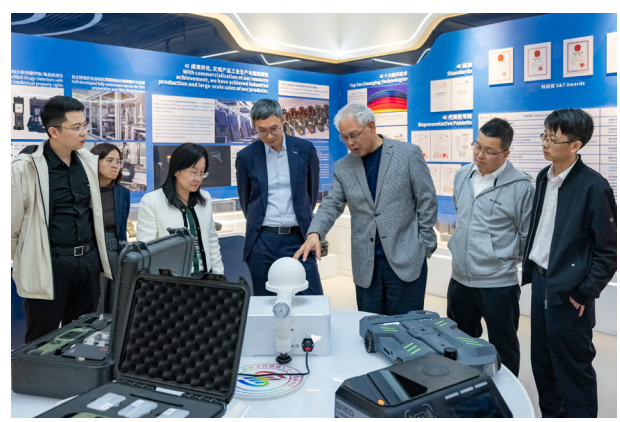
2026 年 4 月 8 日下午，新加坡南洋理工大学陈晓东教授到访陕西师范大学新概念传感器与分子材料研究院，并在房喻院士陪同下参观了研究院展厅，了解研究院基本情况、发展理念、科研方向、技术优势、研究成果及战略布局等情况。

随后，陈晓东教授在长安校区文汇楼作了题为"跨学科学习和教育的若干思考"的专题报告。

报告中，陈晓东教授结合自身科研与教育经历，围绕人工智能与知识快速迭代背景下的跨学科学习展开讲解，并以多位跨学科代表人物为例，分析了交叉融合对于人才培养和科研创新的重要意义，希望同学们能够锤炼批判性思维，提升表达与协作能力，成长为能够驾驭复杂问题、具有竞争力的"π 型"人才。

在交流环节，与会师生围绕跨学科课程设计、科研创新思维培养等话题与陈晓东教授进行了交流探讨。

最后，房喻院士作总结发言。他希望同学们要开阔视野，不断吸收新知识、新理念，注重融会贯通、交叉融合，并勉励大家努力将所学知识运用到更广阔的科研与实践中，



为服务社会、造福人类贡献力量。

报告会由应用表面与胶体化学教育部重点实验室、化学化工学院主办，刘成辉院长主持，200 余名教师和学生代表参加了报告会。

On April 8, 2026, Prof. Chen Xiaogang from Nanyang Technological University in Singapore visited the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University. Accompanied by Prof. Fang Yu, he toured the institute's exhibition room and learned about its basic profile, development philosophy, research directions, technological strengths, research achievements, and strategic planning.

Subsequently, Prof. Chen delivered a report titled "Reflections on Interdisciplinary Learning and Education" in Wenhui Building on SNNU's Chang'an Campus.

In his report, Chen Xiaodong drew on his own research and teaching experience to discuss interdisciplinary learning in the context of rapid advancements in artificial intelligence and knowledge. Citing several prominent figures in interdisciplinary fields, he analyzed the significance of interdisciplinary integration for talent development and scientific innovation, and encouraged students to hone their critical thinking skills, enhance their communication and collaboration abilities, and grow into competitive "π-shaped" professionals capable of tackling complex problems.

During the Q&A session, faculty and students in attendance engaged in a discussion with Prof. Chen on topics such as interdisciplinary curriculum design and fostering innovative thinking in research.

Finally, Prof. Fang Yu delivered the closing remarks. He encouraged the students to broaden their horizons, continuously absorb new knowledge and ideas, and focus on integrating and synthesizing these concepts across disciplines. He also urged them to strive to apply what they have learned to a wider range of research and practical applications, thereby contributing to serving society and benefiting humanity.

The report was hosted by M.O.E. Key Laboratory of Applied Surface and Colloid Chemistry of the Ministry of Education and School of Chemistry and Chemical Engineering, with over 200 faculty members and students in attendance.

程正迪院士参观研究院并做客“长安大讲堂”作报告

Academician Cheng Zhengdi visits SNNU INCSMM and delivers lecture at Chang'an Lecture Series

2026 年 4 月 9 日上午，美国工程院院士、国际高分子科学领域科学家程正迪到访陕西师范大学新概念传感器与分子材料研究院，并在房喻院士陪同下参观了研究院展厅，了解研究院基本情况、发展理念、科研方向、技术优势、研究成果及战略布局等情况。

随后，程正迪院士做客陕西师范大学“长安大讲堂”，作了题为“软合金中巨分子的超晶格工程”的学术报告。报告会由副校长李秉忠教授、化学化工学院院长刘成辉教授共同主持。

报告会上，程正迪院士从分子功能与宏观特性的构效关系出发，剖析了传统高分子材料发展的关键挑战，并阐

释了“精准化学”“精准物理”与“精准加工”的核心理念。他重点介绍了 Molecular Lego（分子乐高）策略在软合金巨分子超晶格工程中的创新应用，从分子层面论述了 F–K 超晶格结构的构建路径，揭示了软物质中 F–K 相行为的演化机制，并解读了超大空间不对称超级晶格结构的形成机理等问题。

在交流环节，现场师生与程院士就软物质材料设计原理等议题展开了讨论。房喻院士对报告会进行了点评总结，高度评价了程正迪院士在软物质科学领域的重要贡献及其对学校相关学科发展与学生教育的重要启示。李保新教授、丁立平教授以及西安交通大学刘峰教授等 200 余名师生参加了本次报告会。

On April 9, 2026, Cheng Zhengdi, a member of the National Academy of Engineering and an internationally renowned scientist in the field of polymer science, visited the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University. Accompanied by Prof. Fang Yu, he toured the institute’s exhibition room and learned about its basic profile, development philosophy, research directions, technological strengths, research achievements, and strategic planning.

Subsequently, Academician Cheng Zhengdi delivered a lecture titled “Superlattice Engineering of Macromolecules in Soft Alloys” as a guest speaker at Shaanxi Normal University’s Chang’an Lecture Series. The lecture was co-chaired by Prof. Li Bingzhong, SNNU vice president, and Prof. Liu Chenghui, dean of the School of Chemistry and Chemical Engineering.

In his report, Cheng Zhengdi analyzed the key challenges in the development of traditional polymer materials from the perspective of the structure-property relationship between molecular functions and macroscopic characteristics, and elaborated on the core concepts of precision chemistry, precision physics, and precision processing. He highlighted the innovative application of the Molecular Lego strategy in the engineering of soft alloy macromolecular superlattices, discussed the construction pathways of F-K superlattice structures at the molecular level, revealed the evolutionary mechanisms of F-K phase behavior in soft matter, and interpreted the formation mechanisms of super-large-scale asymmetric superlattice structures.

During the Q&A session, faculty and students in attendance engaged in a discussion with Cheng Zhengdi on topics such as the design principles of soft matter materials. Prof. Fang Yu provided concluding remarks on the lecture, highly praising Academician Cheng’s significant contributions to the field of soft matter science and his valuable insights for the development of relevant disciplines and student education of the university. Over 200 faculty members and students, including Prof. Li Baoxin, Prof. Ding Liping, and Prof.Liu Feng from Xi’an Jiaotong University, attended the lecture.

山东京博控股集团董事局马韵升主席来访

Board of Directors chairman Ma Yunsheng of Shandong Chambroad Holdings Group received

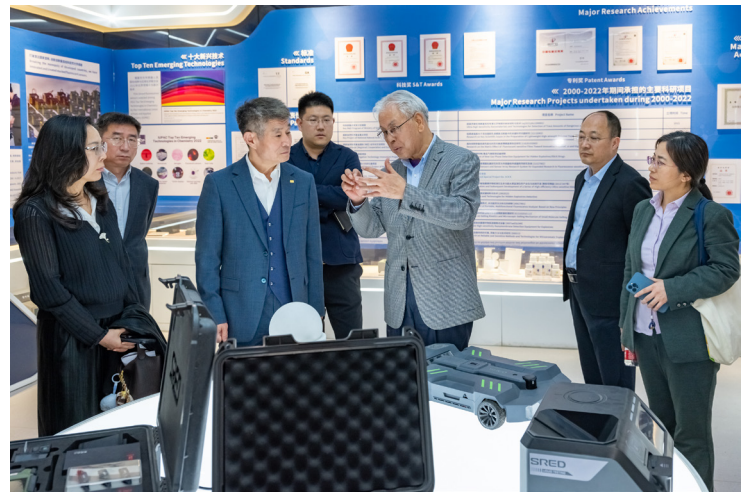
2026 年 4 月 9 日下午，山东京博控股集团有限公司董事局马韵升主席一行到访陕西师范大学新概念传感器与分子材料研究院，并在房喻院士陪同下参观了研究院展厅，了解研究院基本情况、发展理念、科研方向、技术优势、研究成果及战略布局等情况，与房喻院士进行了座谈交流。

京博控股人力资本经营中心总经理马慧婷，黄河三角洲京博化工研究院有限公司总经理于聿律，京博控股科技融创中心助理总经理刘振学、合作发展总监翟红莲及山东省乐安慈孝公益基金会副秘书长张璇璇等，陕西师范大学化学化工学院党委书记李保新，西安交通大学前沿科学与技术研究院党委书记赵卫滨、副院长何刚教授及研究院丁立平副院长、杨小刚副院长、刘太宏教授等参加了座谈交流。

On April 9, 2026, chairman Ma Yunsheng of the Board of Directors of

Shandong Chambroad Holdings Group Co., Ltd. and his delegation visited the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University. Accompanied by Prof. Fang Yu, they toured the institute's exhibition room to learn about its basic profile, development philosophy, research directions, technological strengths, research achievements, and strategic planning, and held a discussion with Prof. Fang Yu.

Ma Huiting, general manager of the Human Capital Management Center at Chambroad Holdings; Yu Yulü, general manager of the Yellow River Delta Chambroad Chemical Research Institute Co., Ltd.; Liu Zhenxue, assistant general manager and Zhai Honglian, director of Cooperative Development of the S&T Innovation Center at Chambroad Holdings; and Zhang Xuanxuan, deputy secretary-general of the Shandong Le'an Charity and Filial Piety Commonweal Foundation; Li Baoxin, party secretary of SNNU School of Chemistry and Chemical Engineering; Zhao Weibin, party secretary and vice dean Prof. He Gang of the Frontier Institute of Science and Technology at Xi'an Jiaotong University; as well as INCSMM vice deans Ding Liping and Yang Xiaogang, and Prof. Liu Taihong, participated in the meeting.



研究院赴汉威科技集团走访交流

INCSMM delegation visits Hanwei Electronics Group Corporation

2026 年 4 月 10 日，陕西师范大学新概念传感器与分子材料研究院副院长杨小刚、研发工程师罗艳彦、王佩，及西安方格分子材料科技有限公司总经理韩鹏一行赴河南郑州走访汉威科技集团股份有限公司，与汉威科技集团首席专家张小水、研发经理刘红霞及相关部门负责人座谈交流。

座谈会上，刘红霞介绍了汉威科技的发展历程、重点业务板块及产品应用领域。杨小刚介绍了研究院的研究方向及西安方格公司的基本情况。随后，罗艳彦、王佩分别作题为《薄膜荧光传感器》和《STCPS 防水拒油透气膜技术及示范应用》的专题报告。随后，双方围绕研究院开发的防水拒油透气膜材料、pH 电极盐桥砂芯、薄膜荧光传感器及柔性 SERS 衬底等技术的应用前景进行了交流与探讨。

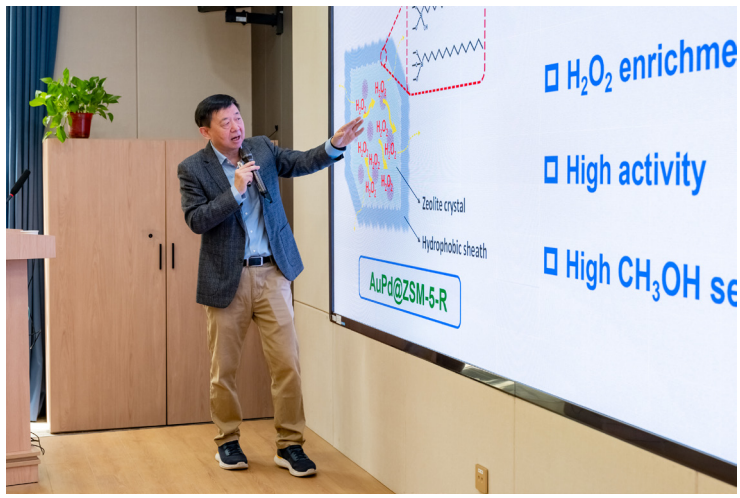
On April 10, 2026, a delegation from the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University—including vice dean Yang Xiaogang and R&D engineers Luo Yanyan and Wang Pei—along with Han Peng, general manager of Xi'an Fangge Molecular Materials Technology Co., Ltd., visited Hanwei Electronics Group Corporation in Zhengzhou, Henan province. They held discussions with Hanwei Electronics chief expert Zhang Xiaoshui, R&D manager Liu Hongxia, and relevant department heads.

At the meeting, Liu Hongxia provided an overview of Hanwei's development history, key business segments, and product application areas. Yang Xiaogang introduced the research directions of the Institute and provided an overview of Xi'an Fangge. Subsequently, Luo Yanyan and Wang Pei presented reports titled "Film-based Fluorescent Sensors" and "STCPS Water-

and Oil-Repellent Breathable Membrane Technology and Demonstrative Applications", respectively. Following this, both parties engaged in discussions regarding the application prospects of technologies developed by the Institute, including waterproof, oil-repellent, and breathable membrane materials; pH electrode salt bridge sand cores; film-based fluorescent sensors; and flexible SERS substrates.

浙江大学肖丰收教授应邀作报告

Prof. Xiao Fengshou of Zhejiang University invited to give a report



2026 年 4 月 16 日上午，浙江大学求是特聘教授、国家杰出青年基金获得者肖丰收教授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"沸石分子筛绿色合成与高效催化"的学术报告。报告会由副院长丁立平教授主持，研究院及化学化工学院相关研究领域的师生参加了报告会。

报告会上，肖丰收教授介绍了沸石分子筛绿色合成与催化领域的前沿进展。针对传统沸石制备能耗高、污染重及金属活性组分易失活两大挑战，其团队发展了无溶剂、无有机模板等绿色合成新路线，并实现多类沸石产品工业化；同时提出金属纳米颗粒晶内镶嵌、表面浸润性调控及"分子围栏"等策略，显著提升了催化剂的活性与稳定性，为相关绿色制造和高性能催化材料创制提供了新思路。

在交流环节，现场师生围绕沸石分子筛的绿色合成路径、金属活性中心的稳定性调控等问题与肖丰收教授展开了讨论。

房喻院士在点评总结中高度评价了肖丰收教授在沸石分子筛绿色合成与催化领域的重要贡献及其对研究院相关研究方向发展的指导意义。

肖丰收教授是国内外催化领域知名学者，现任亚洲太平洋催化理事会主席、国际沸石协会副主席，在 Science、Nature Catalysis 等期刊发表论文 500 余篇，获国际分子筛协会成就奖、亚太催化成就奖等多项荣誉。

报告会前，肖丰收教授在房喻院士陪同下参观了研究院展厅，了解了研究院的建设背景、发展理念、科研方向、技术优势及战略布局等情况。

On April 16, 2026, Prof. Xiao Fengshou, Qiushi Distinguished Professor at Zhejiang University and recipient of the National Science Fund for Distinguished Young Scholars, visited the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University and

delivered a report titled “Green Synthesis and High-Efficiency Catalysis of Zeolite Molecular Sieves”.

The report was chaired by INCSMM vice dean Prof. Ding Liping, and was attended by faculty and students from the Institute and the School of Chemistry and Chemical Engineering who specialize in related research fields.

In the report, Prof. Xiao presented cutting-edge advancements in the green synthesis and catalytic applications of zeolite molecular sieves. Addressing the two major challenges of traditional zeolite preparation—high energy consumption, significant pollution, and the susceptibility of metal active components to deactivation—his team developed new green synthetic routes that are solvent-free and do not require organic templates, and successfully achieved the industrial-scale production of various zeolite products; At the same time, they proposed strategies such as the intragrit embedding of metal nanoparticles, the regulation of surface wettability, and the use of “molecular fences”, which significantly enhanced the activity and stability of the catalysts, providing new insights for the development of green manufacturing processes and high-performance catalytic materials.

During the Q&A session, faculty and students in attendance discussed with Prof. Xiao on topics such as green synthesis routes for zeolite molecular sieves and the regulation of metal active site stability.

In his concluding remarks, Prof. Fang Yu spoke highly of Prof. Xiao’s significant contributions to the field of green synthesis and catalysis of zeolite molecular sieves, as well as the guidance these contributions have provided for the development of related research areas at the institute.

Prof. Xiao Fengshou is a renowned scholar in the field of catalysis both domestically and internationally. He currently serves as chair of the Asia-Pacific Catalysis Council and vice chair of the International Zeolite Association. He has published over 500 papers in journals such as Science and Nature Catalysis, and has received numerous honors, including the International Zeolite Association Achievement Award and the Asia-Pacific Catalysis Achievement Award.

Prior to the report, Prof. Xiao, accompanied by Prof. Fang Yu, toured the institute’s exhibition room to learn about its founding history, development philosophy, research focus, technological strengths, and strategic planning.

研究院师生参加俄罗斯伊万诺沃化工大学“科学之日 2026”会议

INCSMM Faculty and students participate in SCIENCE DAYS at ISUCT-2026 conference

2026 年 4 月 21 日，陕西师范大学新概念传感器与分子材料研究院丁立平教授、彭浩南教授，博士后乔敏，博士研究生陈永、李晶及硕士研究生王俊杰应俄罗斯伊万诺沃化工大学 Tatyana Usacheva 教授邀请，以线上形式参加了该校传统学术会议——“科学之日 2026”。

参会博士后及研究生以全英文形式作了学术报告，包括乔敏的 Multifunctional Fluorescent Probes: From Environmental Waters to Industrial

Solvents、陈永的 A Portable Fluorescent Nanofilm for Ultrasensitive and Dual-Mode Detection of Nerve Agents: From Simulant to Sarin、李晶的 [5]Helicene-Locked AIEgens for Tunable Luminescence and CPL 和王俊杰的 Nanofilm-based Epidermal Dry Electrodes: Innovative Preparation and Applications。

在听取报告的同时，团队教师与 Tatyana Usacheva 教授及参会俄方学者进行了学术交流与探讨。

俄罗斯伊万诺沃化工大学是俄罗斯在化学与化工领域具有深厚底蕴的高等学府，与研究院有着良好的合作和交流关系。

On April 21, 2026, Prof. Ding Liping and Prof. Peng Haonan from the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University, along with postdoctoral researcher Qiao Min, doctoral students Chen Yong and Li Jing, and master's student Wang Junjie, at the invitation from Prof. Tatyana Usacheva of Ivanovo State University of Chemistry and Technology in Russia, participated online in ISUCT's traditional academic conference SCIENCE DAYS at ISUCT-2026.

The participating postdoctoral researcher and graduate students presented reports in English, including Qiao Min's Multifunctional Fluorescent Probes: From Environmental Waters to Industrial Solvents, Chen Yong's A Portable Fluorescent Nanofilm for Ultrasensitive and Dual-Mode Detection of Nerve Agents: From Simulant to Sarin, Li Jing's [5]Helicene-Locked AIEgens for Tunable Luminescence and CPL, and Wang Junjie's Nanofilm-based Epidermal Dry Electrodes: Innovative Preparation and Applications.

While listening to the presentations, Prof. Ding and Prof. Peng engaged in academic exchanges and discussions with Prof. Usacheva and other Russian scholars in attendance.

Ivanovo State University of Chemistry and Technology is a Russian institution of higher education with a long-standing tradition in the fields of chemistry and chemical engineering, with which the institute maintains strong cooperative and exchange ties.

中国空间技术研究院西安分院一行来访交流

China Academy of Space Technology Xi'an Branch visitors received

2026 年 4 月 28 日下午，中国空间技术研究院西安分院空间微波通信全国重点实验室常务副主任惠腾飞一行到访陕西师范大学新概念传感器与分子材料研究院，作学术报告并与房喻院士座谈交流。

首先，空间微波通信重点实验室先进高速数传室副主任朱忠博研究员作了题为《空间太赫兹通信技术需求及发展》的学术报告，分享了太赫兹技术的前沿进展与关键挑战。

随后，空间微波通信重点实验室来宾与房喻院士团队进行了座谈交流，双方围绕当前太赫兹通信技术在材料领域面临的核心技术瓶颈与迫切需求进行了交流，并探讨了未来的合作方向。之后他们还参观了研究院展厅，了解了研究院分子材料与传感器领域的研发进展与应用情况。

先进高速数传室副主任金生霄、邵伟高级工程师，研究院副院长丁立平教授、杨小刚老师，西安交通大学新概念传感器与分子材料研究院执行院长刘峰教授、前沿科学技术研究院副院长何刚教授，以及研究院教师、研发工程师和研究生等参加了报告会。

On April 28, 2026, a delegation led by Hui Tengfei, executive deputy director of the National Key Laboratory of Space Microwave Communications at the Xi'an Branch of the China Academy of Space Technology, visited the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University, where they presented a report and held discussions with Prof. Fang Yu.

First, Researcher Zhu Zhongbo, deputy director of the Advanced High-Speed Data Transmission Laboratory at SMC Lab, presented a report titled "Needs and Development of Space Terahertz Communication Technology", in which he shared the latest advancements and key challenges in terahertz technology.

Following that, SMC Lab guests held a discussion with Prof. Fang Yu's team. The two sides exchanged views on the core technical bottlenecks and urgent needs currently facing terahertz communication technology in the field of materials, and explored future directions for collaboration. Afterward, they toured the institute's exhibition room to learn about it's research and development progress and applications in the field of molecular materials and sensors.

The session was attended by deputy director Jin Shengxiao and senior engineer Shao Wei of SMC Lab's Advanced High-Speed Data Transmission Laboratory; vice deans Prof. Ding Liping and Mr. Yang Xiaogang; Xi'an Jiaotong University Institute of New Concept Sensors and Molecular Materials executive dean Prof. Liu Feng, Institute of Frontier Science and Technology vice dean Prof. He Gang; as well as INCSMM faculty members, R&D engineers, and graduate students.

北京大学郑俊荣教授应邀作报告

Prof. Zheng Junrong of Peking University invited to give a report

2026 年 4 月 29 日下午，北京大学郑俊荣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 What leads to aggregation-induced emission? 的学术报告。

郑俊荣教授的研究聚焦于利用超快紫外 – 可见和红外多脉冲混合序列及非线性光谱技术探究分子电子激发态的演化动力学。他揭示了四苯乙烯分子的聚集诱导发光机理，并发现 AIE 分子的荧光遵循 Anti–Vavilov's rule。基于这一机理，他进一步通过模式选择性振动激发来调控光化学反应，同时解析了系间窜越的速率决定因素。

报告会由边红涛教授主持，房喻

院士以及 30 多名研究院师生参加了报告会，并与郑俊荣教授进行了交流讨论。

On April 29, 2026, Prof. Zheng Junrong from Peking University visited the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University and presented a report titled “What Leads to Aggregation-Induced Emission?”

Prof. Zheng’s research focuses on investigating the evolution dynamics of molecular electronic excited states using ultrafast UV-Vis and IR multi-pulse mixing sequences and nonlinear spectroscopic techniques. He has elucidated the mechanism of aggregation-induced emission in styrenes and discovered that the fluorescence of AIE molecules follows Anti-Vavilov’s rule. Building on this mechanism, he further regulated photochemical reactions through mode-selective vibrational excitation and elucidated the rate-determining factors for inter-system crossing.

The session was chaired by Prof. Bian Hongtao. Prof. Fang Yu and more than 30 faculty members and students from the institute attended the event and engaged in discussions with Prof. Zheng.

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