陕西师范大学 SHAANXI NORMAL UNIVERSITY

西安交通大学 XIAN JIAOTONG UNIVERSITY

2026年5月
May, 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

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房喻院士出席第九届中国化工学会生物化工青年学术年会并作报告

Fang Yu speaks at 9th CIESC Annual Conference on Biochemical Engineering for Young Scholars

2026 年 5 月 6 日，房喻院士应邀出席在西安市举办的第九届中国化工学会生物化工青年学术年会暨陕西省生物制造产业创新大会，并作题为“面向传感与未来技术的分子材料”的大会报告。

此次会议由中国化工学会生物化工专业委员会主办，陕西师范大学、西北大学承办，会议主题为“合成生物筑底未来，绿色智造重构产业”，旨在汇聚领域内优秀青年学者与行业专家，围绕合成生物学前沿技术、绿色生物制造工艺、生物基材料与化学品、智能生物制造等关键方向展开深入研讨。

On May 6, 2026, Prof. Fang Yu was invited to attend the 9th Annual Conference on Biochemical Engineering for Young Scholars of the Chemical Industry and Engineering Society of China and the Shaanxi Provincial Bio-manufacturing Industry Innovation Conference, held in Xi’an, where he delivered a plenary report titled “Molecular Materials for Sensing and Future Technologies”.

Sponsored by CIESC’s Biochemical Engineering Committee and hosted by Shaanxi Normal University and Northwest University, the conference is themed “Synthetic biology laying the foundation for the future, Green intelligent manufacturing reshaping industry”. It aims to bring together outstanding young scholars and industry experts in the field for in-depth discussions on key topics such as cutting-edge synthetic biology technologies, green biomanufacturing processes, bio-based materials and chemicals, and intelligent biomanufacturing.

刘太宏教授及学生参加第九届全国激光光谱技术学术论坛

Liu Taihong and students attend 9th National Forum on Laser Spectroscopy Technology

2026 年 5 月 8 日至 10 日，陕西师范大学新概念传感器与分子材料研究院刘太宏教授及三名研究生参加了在江西南昌举办的第九届全国激光光谱技术学术论坛。

刘太宏教授作了题为“功能小分子控制组装和激发态性能调控”的邀请报告，博士生李书飞作了题为“四偶极 IDIC 衍生物的端基取代效应及其强双光子吸收特性研究”的口头报告。

本次会议由中国光学学会、南昌航空大学主办，中国光学学会激光光谱学专业委员会、江西省光学学会等单位承办。

From May 8 to 10, 2026, Prof. Liu Taihong and his three graduate students from the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University attended the 9th National Academic Forum on Laser Spectroscopy Technology, held in Nanchang, Jiangxi province.

Prof. Liu presented an invited report titled “Controlled assembly and excited-state property modulation of functional small molecules”, while doctoral student Li Shufei presented an oral report titled “End-group substitution effects of quadrupolar IDIC derivatives and their strong two-photon absorption properties”.

This conference was sponsored by the Chinese Optical Society and Nanchang Hangkong University, and organized by organizations and institutions including COS Laser Spectroscopy Committee and Jiangxi Optical Society.

刘忠山副教授参加中国化学会第十六届全国生物医药色谱质谱及相关技术学术报告会

Liu Zhongshan presents at CCS 16th Symposium on Biomedical Chromatography, Mass Spectrometry and Related Technologies

2026 年 5 月 8 日至 10 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苏淮安举办的“中国化学会第十六届全国生物医药色谱质谱及相关技术学术报告会”，并作题为“基于薄膜荧光传感的微型色谱检测器研究”的口头报告，介绍了将荧光整体柱与薄膜荧光传感集成为微型液相色谱检测器的研究成果。

本次会议由北京理化分析测试技术学会承办，淮安大学协办。

From May 8 to 10, 2026, Assoc. Prof. Liu Zhongshan from the Institute of New Concept Sensors and Molecular Materials of Shaanxi Normal University attended the “16th National Symposium on Biomedical Chromatography, Mass Spectrometry and Related Technologies” (BCM 2026) hosted by the Chinese Chemical Society in Huai’an, Jiangsu Province. He presented an oral report titled “Miniaturized chromatographic detector enabled by film-based fluorescent sensing technique”, introducing research findings on the integration of monolithic fluorescence columns with film-based fluorescence sensing into miniature liquid chromatography detectors.

The conference was organized by the Beijing Society of Physical and Chemical Analysis and Testing Technology, with Huai’an University serving as a co-organizer.

房喻院士出席复旦大学化学系创建 100 周年大会并作论坛报告

Fang Yu attends centennial celebration of Fudan University's Chemistry Department and delivers forum presentation

2026 年 5 月 17 日，房喻院士在上海出席复旦大学化学系创建一百周年大会，并在“分析化学与化学生物学智能交叉前沿论坛”上作了题为“面向传感与未来技术的分子材料”的报告。

On May 17, 2026, Prof. Fang Yu attended the centennial celebration of the Department of Chemistry at Fudan University in Shanghai and delivered a presentation titled “Molecular Materials for Sensing and Future Technologies” at the “Frontier Forum on the Intelligent Convergence of Analytical Chemistry and Chemical Biology”.

房喻院士出席中国化学会第 22 届全国化学热力学与热分析学术会议并作报告

Fang Yu speaks at 22nd CCS Conference on Chemical Thermodynamics and Thermal Analysis

2026 年 5 月 15 日至 17 日，房喻院士出席了在宁夏银川举行的中国化学会第 22 届全国化学热力学与热分析学术会议，并作题为“面向传感与未来技术的分子材料”的大会报告。

会议以“新范式、新动能——化学热力学与热分析赋能可持续发展未来”为主题，由中国化学会化学热力学与热分析专业委员会和宁夏大学共同主办，设热力学、溶液化学、热化学与相平衡、仪器方法与交叉领域、青年论坛、中日友好论坛 6 个分论坛，聚焦绿色溶剂、相变储能、电催化、MOF/COF 功能材料制备热力学等热点方向。

From May 15 to 17, 2026, Prof. Fang Yu attended the 22nd National Conference on Chemical Thermodynamics and Thermal Analysis of the Chinese Chemical Society, held in Yinchuan, Ningxia, and delivered a plenary report titled “Molecular Materials for Sensing and Future Technologies”.

Under the theme “New Paradigms, New Momentum — Chemical Thermodynamics and Thermal Analysis Empowering a Sustainable Future”, the conference was co-hosted by CCS Chemical Thermodynamics and Thermal Analysis Committee and Ningxia University. It featured six parallel sessions — Thermodynamics, Solution Chemistry, Thermochemistry and Phase Equilibrium, Instrumental Methods and Interdisciplinary Fields, Youth Forum, the China-Japan Friendship Forum, focusing on hot topics such as green solvents, phase-change energy storage, electrocatalysis, and the thermodynamics of MOF/COF functional material synthesis.

房喻院士在 2026 年全国研究生导师培训班开班仪式上作报告

Fang Yu speaks at Opening Ceremony of 2026 National Graduate Advisor Training Program

2026 年 5 月 20 日上午，房喻院士应邀出席 2026 年全国研究生导师培训班（第二期）开班仪式，并作题为“创新驱动发展呼唤面向未来的研究生教育”的报告。

教育部教师工作司副司长韩劲红、教育部学位与研究生教育发展中心副主任亓彦伟、陕西师范大学校长陈新兵等领导出席开班仪式，并与房喻院士一起为陕西师范大学研究生导师学院揭牌。

此次培训班由教育部学位管理与研究生教育司和教师工作司指导，教育部学位与研究生教育发展中心主办，陕西师范大学承办，来自全国的 400 余位新聘研究生导师参加了培训。

On May 20, 2026, Prof. Fang Yu was invited to attend the opening ceremony of the 2026 National Graduate Advisor Training Program (Session 2) and delivered a report titled “Innovation-Driven Development Calls for Future-Oriented Graduate Education”.

On May 20, 2026, Prof. Fang Yu was invited to attend the opening ceremony of the 2026 National Graduate Advisor Training Program (Session 2) and delivered a report titled “Innovation-Driven Development Calls for Future-Oriented Graduate Education”.

房喻院士出席国际智能感知学会成立大会并当选理事

Fang Yu elected board director at inaugural conference of International Society for Sensing Technology

2026 年 5 月 22 日至 24 日，陕西师范大学房喻院士及团队成员参加了在成都举办的国际智能感知学会（ISST）成立大会暨 2026 国际传感技术及应用大会（ICSA 2026），房喻院士当选国际智能感知学会理事，陕西师范大学当选国际智能感知学会创始会员单位。

大会期间，房喻院士担任学术顾问主席，主持了大会主旨报告环节。丁立平教授受邀作了题为 Creation of Interface-confined Fluorescent Nanofilms and Exploration of Their Applications in Chemical and Physical Sensing 的邀请报告，刘太宏教授作了题为 Interfacially Confined Nanofilms

Towards Enhanced Fluorescence Sensing 的口头报告。博士研究生于敬华，硕士研究生张宇玉、陈怡嘉以墙报形式参会。

国际智能感知学会由中国仪器仪表学会、英国皇家特许计量及控制学会、意大利仪器制造商协会共同发起，属于国际学术性非营利社会组织，旨在推动智能感知领域内的国际交流合作和产学研用一体化发展，通过智能感知技术为可持续发展目标提供支持。本次大会吸引了来自全球 14 个国家和地区的 300 余位院士专家、国际嘉宾、行业学者、企业代表参会。

From May 22 to 24, 2026, Prof. Fang Yu and members of his group from Shaanxi Normal University attended the Inaugural Conference of the International Society of Sensing Technology (ISST) and the 2026 International Conference on Sensors and their Applications (ICSA 2026), held in Chengdu. Fang Yu was elected to Board of Directors, and Shaanxi Normal University was elected as a founding member of the society.

During the conference, Fang Yu served as academic advisory chair and presided over the plenary session. Prof. Ding Liping presented an invited report titled “Creation of Interface-confined Fluorescent Nanofilms and Exploration of Their Applications in Chemical and Physical Sensing”, while Prof. Liu Taihong presented an oral report titled “Interfacially Confined Nanofilms Towards Enhanced Fluorescence Sensing”. Doctoral student Yu Jinghua and master’s students Zhang Yuyu and Chen Yijia participated in the conference by presenting posters.

The International Society of Sensing Technology was jointly founded by the Chinese Society of Instrumentation, the Chartered Society of Measurement and Control (UK), and the Italian Association of Instrument Manufacturers. As an international, academic, and non-profit organization, it aims to promote international exchange and cooperation in the field of smart sensing, as well as the integrated development of industry, academia, research, and application, thereby supporting sustainable development goals through sensing technologies. The conference attracted over 300 participants, including academicians, scholars, international guests, industry experts, and corporate representatives from 14 countries and regions globally.

刘忠山副教授参加中国化学会第四届全国质谱分析学术报告会

Liu Zhongshan presents at CCS 4th National Conference on Mass Spectrometry Analysis

2026 年 5 月 22 日至 25 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北京举办的“中国化学会第四届全国质谱分析学术报告会”，并在环境分析分会作了题为“面向全氟有机污染物的微型色谱检测器研究”的口头报告，介绍了基于薄膜荧光传感技术的微型液相色谱检测器创制原理及其对全氟有机污染物分离检测的研究成果。

本次会议由中国化学会质谱分析专业委员会、中国物理学会质谱分会和中国分析测试协会主办，中国科学院生态环境中心环境化学与环境毒理全国重点实验室承办。

From May 22 to 25, 2026, Assoc. Prof. Liu Zhongshan from the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University attended the “Chinese Chemical Society Fourth National Conference on Mass Spectrometry Analysis” in Beijing. He presented an oral report titled “Miniaturized liquid chromatography detector for the sensing of perfluoroalkyl substances” at the Environmental Analysis Session, introducing the principles behind the development of miniaturized liquid chromatography detectors based on film fluorescence sensing technology and presenting research findings on the separation and detection of perfluorinated organic pollutants.

The conference was organized by the Mass Spectrometry Analysis Committee of the Chinese Chemical Society, the Mass Spectrometry Branch of the Chinese Physical Society, and the Chinese Society for Analytical Chemistry, and hosted by the State Key Laboratory of Environmental Chemistry and Ecotoxicology at the Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences.

教育部党组书记、部长怀进鹏一行来研究院调研

Minister of Education Huai Jinpeng visits SNNU INCSMM

2026 年 5 月 26 日，教育部党组书记、部长怀进鹏一行来陕西师范大学新概念传感器与分子材料研究院调研，听取了房喻院士关于学科交叉研究进展与创新成果转化情况的介绍，肯定了研究院在产出高水平研究成果、培养高素质人才等方面的成绩。

教育部办公厅主任崔保师、思想政治工作司司长魏士强、高等教育司司长周天华等，陕西省委教育工委书记、省教育厅厅长王树声参加调研。校党委书记李晓兵、校长陈新兵陪同调研。

On May 26, 2026, Huai Jinpeng, secretary of the Party Group and minister of the Ministry of Education, led a delegation to visit the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University. He listened to the introduction by Prof. Fang Yu on the progress of interdisciplinary research and the commercialization of innovative achievements, and commended the institute's accomplishments in producing high-quality research outcomes and cultivating highly qualified talent.

MOE General Office director Cui Baoshi, Ideological and Political Work Department director Wei Shiqiang, Higher Education Department director Zhou Tianhua, along with Wang Shusheng, secretary of the Shaanxi Provincial Education Working Committee and director of the Provincial Department of Education, participated in the research visit. SNNU Party Secretary Li Xiaobing, and president Chen Xinbing accompanied the visit.

研究院 2026 届研究生毕业生通过毕业论文答辩

Minister of Education Huai Jinpeng visits SNNU INCSMM

2026 年 5 月 27 日和 28 日，陕西师范大学新概念传感器和分子材料研究院 2026 届物理化学专业的胡定芳、邵洋涛、苟欣瑜、罗艳等 6 名博士研究生，以及化学、材料与化工及化学工程与技术三个专业的江艳、王俊杰、周星彤、冀雪儿等 35 名硕士研究生进行了毕业论文答辩。

在同学们的毕业论文陈述之后，由南开大学卜显和教授、中国科学院大学江桂斌教授、中国科学院化学研究所李永舫教授、西安交通大学张明明教授、西北工业大学于涛教授为代表的 18 位校外专家和 15 位校内专家组成的答辩委员会评委专家对同学们进行了提问、评议和点评，并对毕业论文提出了完善修改意见。

经讨论，答辩委员会一致认为 41 位毕业生同学的研

究内容充分，回答问题清楚，逻辑合理，同意通过答辩并建议授予相应的博士学位和硕士学位。

On May 27 and 28, 2026, six doctoral students in the Physical Chemistry program—including Hu Dingfang, Shao Yangtao, Gou Xinyu, and Luo Yan—along with 35 master's students from the Chemistry, Materials and Chemical Engineering, and Chemical Engineering and Technology programs—including Jiang Yan, Wang Junjie, Zhou Xingtong, and Ji Xue'er—all students from the Class of 2026 at the Institute of New Concepts Sensors and Molecular Materials of Shaanxi Normal University, defended their theses.

Following the students' thesis presentations, a panel of examiners—comprising 18 external experts, including Prof. Bu Xianhe of Nankai University, Prof. Jiang Guibin of the University of Chinese Academy of Sciences, Prof. Li Yongfang of the Institute of Chemistry, Chinese Academy of Sciences, Prof. Zhang Mingming of Xi'an Jiaotong University, and Prof. Yu Tao of Northwestern Polytechnical University, as well as 15 SNNU experts—asked questions, provided feedback, and offered comments to the students, and suggested revisions to improve their theses.

After deliberation, the defense committee unanimously agreed that the 41 students had presented thorough research, provided clear answers, and demonstrated sound reasoning. The committee approved their defenses and recommended that they be awarded the corresponding doctoral and master's degrees.

“传感器阻隔膜材料创制及应用”科技成果通过鉴定

S&T Project on Development and Application of Sensor Barrier Membrane Materials passes appraisal

2026 年 5 月 28 日，中国仪器仪表学会组织专家在西安召开科技成果鉴定会，对陕西师范大学新概念传感器与分子材料研究院完成的“传感器阻隔膜材料创制及应用”项目进行了鉴定，并经评议认定该项科技成果达到国际领先水平。

鉴定委员会由中国科学院生态环境研究中心江桂斌院士担任组长，中国科学院化学研究所李永舫院士、南开大学卜显和院士、原总装备部科技委正军职常任委员曹保榆将军、军事科学院防化研究院核生化灾害防护化学全国重点实验室主任、专业技术少将研究员习海玲，以及来自军事科学院防化研究院、东南大学、清华大学、西北工业大学，及重庆川仪自动化股份有限公司和西安中星测控有限公司等单位的学者专家共同组成。

陕西师范大学周正朝副校长和中国仪器仪表学会科技与产业发展部副主任李杰出席会议并致辞。会议由陕师大科学技术处处长薛东教授主持。

在会上，项目完成单位介绍项目具体情况，分别由彭军霞教授作研发历程报告、王佩工程师作项目技术报告及杨小刚副院长作成果转化报告。

经过专家组提问质询、讨论，形成的鉴定意见认为：项目组开发的 STCPS 阻隔膜材料综合性能优异，制造工艺先进，条件温和，能耗低，几无“三废”排放；原料及生产设备立足国产，稳定剂，助剂，辅料及品控设备均为自主研制，实现了材料品种与制备工艺的双重创新，整体技术达到国际领先水平。

传感器阻隔膜材料是房喻院士团队基于分子凝胶技术、从基础到产业应用全链条研发的新型 STCPS 气液分离阻隔膜材料。该项科技成果面向仪器仪表、工业装备、民生健康、公共安全等领域对高性能气液分离阻隔膜材料的关键需求，打破国外企业对高端膜材料技术垄断，已实现规模化生产并取得显著社会经济效益。

陕师大化学化工学院党委书记李保新、院长刘成辉、副院长丁立平，科学技术处副处长屈新运出席会议，新概念研究院研发工程师文瑞娟、罗艳彦等参加会议。

On May 28, 2026, the Chinese Society of Instrumentation organized a panel of experts to convene a scientific and technological achievement appraisal meeting in Xi'an. The meeting appraised the project "Development and Application of Sensor Barrier Membrane Materials", completed by the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University. Following evaluation, the project was recognized as having reached an internationally leading level.

The Evaluation Committee is chaired by Academician Jiang Guibin of the Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, and comprises Academician Li Yongfang of CAS Institute of Chemistry, Academician Bu Xianhe of Nankai University, General Cao Baoyu, former standing member of the Science and Technology Commission of the General Armaments Department, and Xi Hailin, Major General (Technical) researcher and director of the National Key Laboratory of Chemical, Biological, and Radiological Disaster Protection at the Institute of Chemical Defense, Academy of Military Sciences, as well as scholars and experts from AMS Institute of Chemical Defense, Southeast University, Tsinghua University, Northwestern Polytechnical University, Chongqing Chuanyi Automation Co., Ltd. and Xi'an Zhongxing Measurement and Control Co., Ltd.

Zhou Zhengchao, vice president of Shaanxi Normal University, and Li Jie, deputy director of CIS's Department of Science, Technology, and Industrial Development, attended and delivered remarks. The meeting was chaired by Prof. Xue Dong, director of SNNU Department of Science and Technology.

At the meeting, the project team presented details of the project. Prof. Peng Junxia presented a report on the research and development process, Engineer Wang Pei presented a technical report on the project, and INCSMM vice dean Yang Xiaogang gave a report on the commercialization of the project's outcomes.

Following questioning and discussion by the expert panel, the expert opinion concluded that: the STCPS barrier membrane material developed by the project team exhibits excellent overall performance, features an advanced manufacturing process, employs mild processing conditions, consumes low energy, and generates virtually no emissions of "three wastes". Its raw materials and production equipment are sourced domestically, while stabilizers, additives, auxiliary materials, and quality control equipment were all independently developed, achieving dual innovation in both material types and preparation processes, and the overall technology has reached an internationally leading level.

The sensor barrier membrane material is a novel STCPS gas-liquid separation barrier membrane developed by Prof. Fang Yu's team through a full-chain R&D process — from fundamental research to industrial applications — based on molecular gel technology. This technological achievement addresses the critical demand for high-performance gas-liquid separation barrier membranes in fields such as instrumentation, industrial equipment, public health, and public security. It has broken the monopoly held by foreign companies on high-end membrane materials technology, achieved large-scale production, and yielded significant socioeconomic benefits.

SNNU School of Chemistry and Chemical Engineering Party Secretary Li Baoxin, dean Liu Chenghui and vice dean Ding Liping, S&T Department deputy director Qu Xinyun, as well as R&D engineers Wen Ruijuan and Luo Yanyan attended the meeting.

2026 西部高校化学专业（师范）虚拟教研室工作研讨会举办

2026 Workshop on Virtual Teaching and Research Office for Chemistry (Teacher Education) Programs at Western Universities held

2026 年 5 月 30 日至 31 日，陕西师范大学新概念传感器与分子材料研究院与陕师大化学化工学院和应用表面与胶体化学教育部重点实验室共同承办的 2026 西部高校化学专业（师范）虚拟教研室工作研讨会在西安举办。

5 月 30 日上午，来自厦门大学、山东大学、北京师范大学和《化学教育》期刊的专家和依托西部高校化学专业（师范）虚拟教研室的 30 多所师范院校教师代表参加了在新概念传感器与分子材料研究院报告厅举行的开幕式。开幕式由化学化工学院党委书记李保新教授主持，王云博副校长出席并致辞。

开幕式后的特邀报告环节，教育部高等学校化学类专业教学指导委员会秘书长、厦门大学朱亚先教授作题为《数智融合视域下化学类虚拟教研室建设探索》的报告，教指委委员兼应用化学专业协作组组长、山东大学张树永教授作题为《我国高等化学师范教育当前的问题与几点建议》的报告，教指委（高师协作组）副组长、北京师范大学范楼珍教授作题为《物理化学数智化教学改革与实践》的报告，《化学教育》副主编朱玉军教授作题为《新时代化学教师教育的战略布局、目标任务与实施路径》的报告。特邀报告分别由李保新教授和全国优秀教师、陕西省教学名师陈亚芍教授主持。

5 月 30 日下午，西北师范大学宋鹏飞教授、四川师范大学伍晓春教授、青海师范大学郭珍教授、新疆师范大学董玲副教授、宁夏师范大学赵文霞教授、延安大学简选副教授分别作报告。报告分别由陕西理工大学季晓晖教授和厦门大学詹东平教授主持。

报告结束后，参会专家学者分别围绕“数智赋能教育教学”和“数智赋能实验教学”主题开展分组讨论。

5 月 31 日上午，在虚拟教研室常务副主任彭浩南教授主持下，陕师大魏灵灵教授和张琦教授分别对前一天的分组讨论进行了总结。智慧树网黄丽娜和超星集团钱会博分别介绍了“AI 赋能化学类课程与专业的教学改革创新与实践”和“能力培养为导向、学科专业为载体的创新人才培养模式”。

报告结束后，虚拟教研室主任房喻院士为西部高校化学专业（师范）虚拟教研室首批成员单位授牌。翟全国副院长介绍虚拟教研室拟设立开放课题情况。

在会议总结环节，房喻院士作题为《AI 赋能下的化学专业人才培养——我的点滴思考》的报告。房喻院士梳理了历次科技革命为人类文明发展提供的根本性动力，指出国家核心竞争力来源于人才的培养，其核心在于“培育土壤”和“打造文化”。人工智能时代，教师将从知识传授者转变为学生学习的陪伴者和价值的引导者，在智慧教学过程中要解放学生的知识学习负担，着重培育学生自主能力、创新思维、家国情怀与坚韧品格。

最后，刘成辉院长代表学院和虚拟教研室向各位领导、专家和兄弟院校代表的指导和支持表示感谢，并希望与兄弟院校强化交流、合作共赢，推进化学师范教育数智化转型，为国家卓越教师培养贡献更多的智慧和方案。

On May 30 and 31, 2026, the 2026 Workshop on Virtual Teaching and Research Office for Chemistry (Teacher Education) Programs at Western Universities was held in Xi'an. The event was jointly organized by Shaanxi Normal University Institute of New Concept Sensors and Molecular Materials, School of Chemistry and Chemical Engineering, and Ministry of Education Key Laboratory of Applied Surface and Colloid Chemistry .

On the morning of May 30, experts from Xiamen University, Shandong University, Beijing Normal University, and the journal Chemical Education, along with faculty representatives from more than 30 teacher-training institutions affiliated with the Virtual Teaching and Research Office for Chemistry (Teacher Education) at Western Universities, attended the opening ceremony held in INCSMM lecture hall. SNNU vice president Wang Yunbo attended the ceremony and delivered a speech, which was presided over by SCCE Party Secretary Prof. Li Baoxin.

During the invited lecture session following the opening ceremony, Prof. Zhu Yaxian of Xiamen University, secretary-general of MOE's Teaching Guidance Committee for Chemistry Majors in Higher Education, presented a report titled "Exploring the Development of Virtual Teaching and Research Offices for Chemistry Majors from the Perspective of Digital-Intelligent Integration", Prof. Zhang Shuyong of Shandong University, a member of the Teaching Guidance Committee and head of the Applied Chemistry Collaborative Group, presented a report titled "Current Issues and Several Recommendations for Higher Chemistry Teacher Education in China", Prof. Fan Louzhen of Beijing Normal University, deputy head of the Teaching Guidance Committee (Higher Normal Education Collaborative Group), presented a report titled "Teaching Reform and Practice in Physical Chemistry through Digital and Intelligent Integration", and Prof. Zhu Yujun, deputy editor-in-chief of Chemical Education, presented a report titled "Strategic Planning, Objectives,

Tasks, and Implementation Pathways for Chemistry Teacher Education in the New Era". The invited lectures were chaired by Prof. Li Baoxin and Prof. Chen Yashuo, a National Outstanding Teacher and a Shaanxi Provincial Distinguished Teacher.

On the afternoon of May 30, Prof. Song Pengfei from Northwest Normal University, Prof. Wu Xiaochun from Sichuan Normal University, Prof. Guo Zhen from Qinghai Normal University, Assoc. Prof. Dong Ling from Xinjiang Normal University, Prof. Zhao Wenxia from Ningxia Normal University, and Assoc. Prof. Jian Xuan from Yan'an University each presented a report. The sessions were chaired by Prof. Ji Xiaohui from Shaanxi University of Technology and Prof. Zhan Dongping from Xiamen University, respectively.

Following the presentation, the participating experts and scholars engaged in group discussions on the themes of "Empowering Education and Teaching with Digital Intelligence" and "Empowering Laboratory Instruction with Digital Intelligence".

On the morning of May 31, under the chairmanship of Prof. Peng Haonan, executive deputy director of the Virtual Teaching and Research Office, Professors Wei Lingling and Zhang Qi from Shaanxi Normal University presented summaries of the previous day's group discussions. Huang Lina from Wisdom Tree and Qian Huibo from SuperStar Group presented on "AI-Empowered Innovation and Practice in Teaching Reform for Chemistry Courses and Programs" and "An Innovation-Oriented Talent Development Model Centered on Competency Development and Grounded in Disciplinary Specializations", respectively.

Following the presentation, Prof. Fang Yu, director of the Virtual Teaching and Research Office, presented plaques to the inaugural member institutions of the Virtual Teaching and Research Office for Chemistry (Teacher Education) at Western Universities. Vice dean Zhai Quanguo outlined the proposed open research projects to be established by the Virtual


化学专业科技信息素养课程的
宋鹏飞
西北师范大学
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2026年5月


数智化赋能无机化
改革和实
汇报人：伍晓
四川师范大学 化学与材
2026年5月30日


化学（师范）一流专业建设汇
青海师范大学化学化工学院 郭珍
2026 年 5 月 30 日 西安


化育新师
学以兴疆
基于“问思融育”模式的
《化学学科教学论》教学创新与实践
新疆师范大学化学化工学院
董玲
2026年5月30日·西安


数智赋能筑根基 四轮驱
面向宁南基础教育的化学师范
汇报人：赵文霞
时 间：2026.05.30


化学卓越教师“一核两翼四
的探索与实践
延安大学 简选
2026年5月30日


“数智赋能实验教学”专题讨论

5月29-31日 | 中国 · 西安
汇报人：魏灵灵
陕西师范大学

2026 西部高校化学专业（师范）
虚拟教研室工作研讨会
5月29-31日 | 中国 · 西安

陕西师范大学
2026
西部高校化学专业（师范）

能力培养为导向 学科专业为载体
创新人才培养模式
钱会博

陕西师范大学 SHAANXI NORMAL UNIVERSITY
2026 西部高校化学专业（师范） 虚拟教研室工作研讨会
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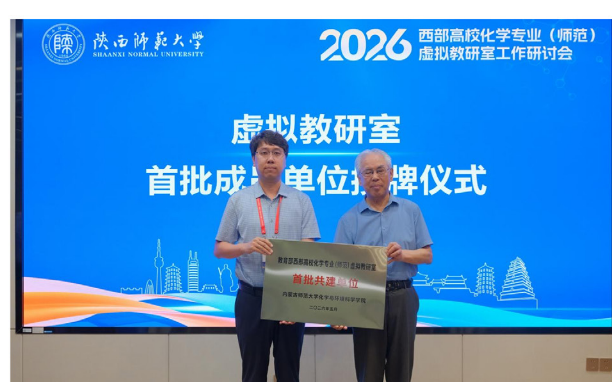
虚拟教研室



陕西师范大学 SHAANXI NORMAL UNIVERSITY
2026 西部高校化学专业（师范） 虚拟教研室工作研讨会

Teaching and Research Office.

During the closing session of the conference, Fang Yu delivered a report titled “AI-Empowered Training of Chemistry Professionals: My Reflections”.Fang Yu traced the fundamental driving forces that past scientific and technological revolutions have provided for the development of human civilization, pointing out that a nation’s core competitiveness stems from talent development, the essence of which lies in “cultivating the soil” and “building a culture”. In the era of artificial intelligence, teachers should transition from mere transmitters of knowledge to companions in students’ learning and guides in value formation. In the process of intelligent teaching, they must alleviate students’ academic burdens and focus on cultivating their autonomy, innovative thinking, patriotic spirit, and resilience.

In the end, Prof. Liu Chenghui, on behalf of the SCCE and the Virtual Teaching and Research Office, expressed gratitude to the officials, experts, and representatives from partner institutions for their guidance and support. He expressed the hope to strengthen exchanges and foster mutually beneficial cooperation with partner institutions, advance the digital and intelligent transformation of chemistry teacher education, and contribute more insights and solutions to the cultivation of outstanding teachers for the nation.

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Article

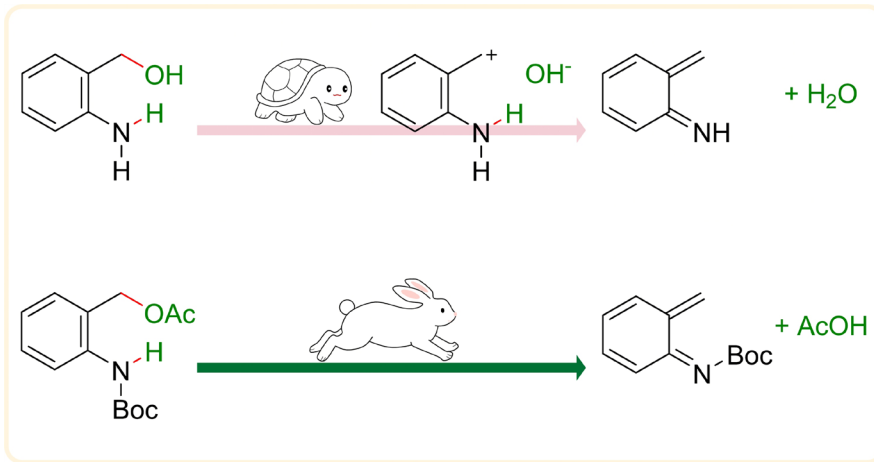
Ultrafast Formation of Aza-Quinone Methides from Suitably Substituted *o*-Hydroxymethylanilines Involves Higher Excited States

Yifan Su, Nađa Došlić,* Manuel Martinović, Mladena Glavaš, Josip Draženović, Jiani Ma,* and Nikola Basarić*

Cite This: https://doi.org/10.1021/jacs.5c21621

官能团化的邻羟甲基苯胺经高激发态超快生成氮杂 – 醌甲基化物

Yifan Su, Nađa Došlić, Manuel Martinović, Mladena Glavaš, Josip Draženović, Jiani Ma, and Nikola Basarić. J. Am. Chem. Soc. 2026, DOI: https://doi.org/10.1021/jacs.5c21621



醌甲基化物（QM）是酚类化学和光化学中常见的反应性中间体，在过去十年，因其在有机合成中的应用而重新焕发活力。其中，氮杂醌甲基化物（aza-QM）是制备氮杂杂环的优秀前体。然而，aza-QM 的制备通常涉及芳香性的破坏，往往需要苛刻的反应条件。光化学方法只依赖于在环境温度下使用光子，是一种相对温和的方法，并且可以实现对反应的时空控制。因此，通过光化学方法合成 aza-QM 颇具吸引力。马佳妮课题组与鲁杰尔·博什科维奇研究所（Institut Ruder Boskovic）的尼古拉·巴萨里奇（Nikola Basarić）教授近十年围绕光致醌甲基前体的理性设计及光化学反应机制研究展开了系列合作。双方的合作代表作发表在 Journal of the American Chemical Society（2017, 139, 18349−18357），Journal of Organic Chemistry（2019, 84, 8630−8637；2023, 88, 15176–15188）等期刊，并在 Physical Chemistry Chemical Physics（2025, 27, 15272–17292）发表综述文章。

邻羟甲基苯胺（1）在光照下会经历脱水过程生成 aza–QM，并且具有较高的光乙醇解反应量子产率（Φ_R = 0.40）。本文结合瞬态吸收光谱实验和理论计算，对 1 光致生成 aza-QM

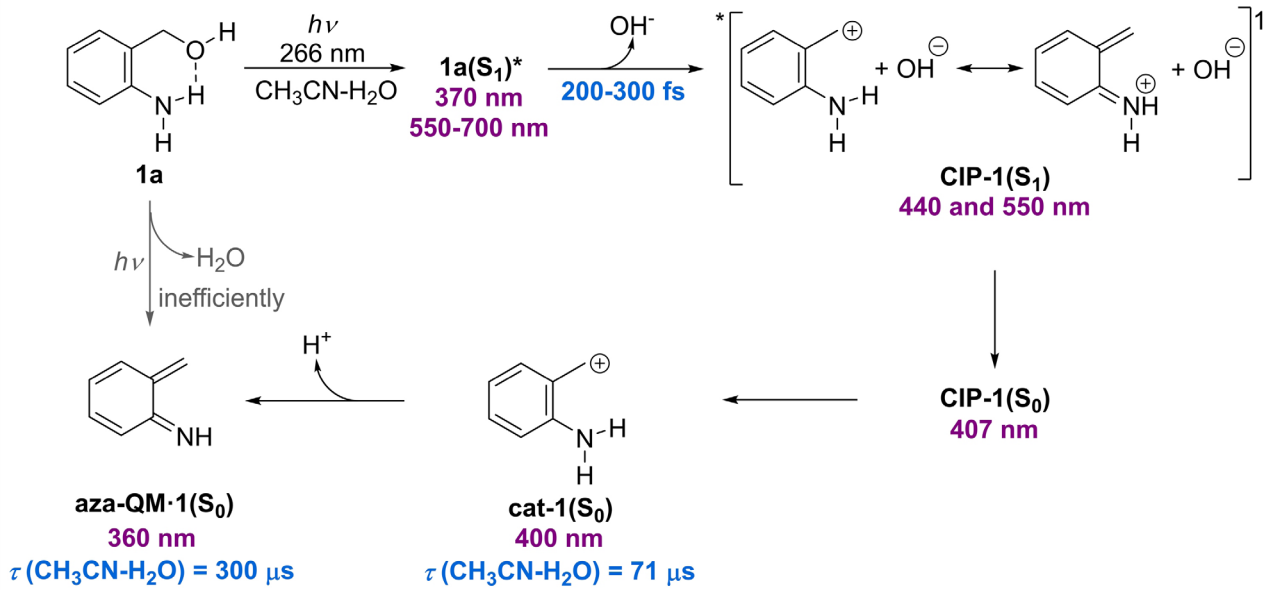


图 1. 1 的光致脱水反应机理

Figure 1. The H2O photoelimination mechanism from 1

的反应过程进行了详细研究（图 1）。1 的光致生成 aza-QM 过程遵循逐步反应机制。1 受光激发至 S_1（ππ*）态，随后经历 S_1（ππ*）/S2（nσ*）的锥形交叉点，并发生苄基位置 C–O 键的断裂。然而 ππ* 和 nσ* 态之间的非绝热布居转移效率低下，并且锥形交叉点后 ππ* 态表现出较长的平台期，导致紧密离子对的寿命较长。所以瞬态吸收光谱实验中观察到了紧密离子对的激发单线态。随后，激发单线态的紧密离子对经历锥形交叉点回到基态，并经历脱质子化依次生成碳正离子和 aza-QM。

为了使光致生成 aza-QM 更加高效，在 1 上引入 N- 叔丁氧羰基和 O- 乙酰基设计了 N- 叔丁氧羰基 -O- 乙酰基 – 氨基苯甲醇（5）（图 2）。5 的光化学反应更加干净和有效，并且光乙醇解反应的量子产率与 1 相当（Φ_R = 0.49）。这是由于叔丁氧羰基的引入不仅增加了 NH 的酸度，并且增加了用于消除的反应性构象的数量，有利于 AcOH 的同步消除。其次，相比于羟基，乙酰基是更好的离去基团。乙酰基还引入了可以消除乙酸的额外 nπ* 态，从而改变了反应的内在机制。因此，5 的激发态苄基位置 C–O 键解离有两种机制。第一种机制与 1 相似，涉及初始激发的 ππ* 态和解离的 nσ* 态之间的锥形交叉点。然而，S_2（nσ*）/S_1（ππ*）的锥形交叉点后 ππ* 态能量的急剧上升促进了更有效的 C–O 键裂解。第二种机制得益于额外的 nπ* 态。分子受光激发至 S_1（ππ*）态，随着乙酰基上 C–O 的延长，S_3（nπ*）态趋于稳定，并生成 S_1（nπ*）态。紧接着，分子经历 nπ*/nσ* 的锥形交叉点并发生 C–O 键的断裂。一旦达到 nσ*，苄基位置的 C–O 键就会发生断裂，随后通过 S_1/S_0 的锥形交叉点迅速生成 aza-QM。因此，5 的光致生成 aza-QM 是一个没有可检测中间体的超快过程。值得注意的是，5 作为前体光致生成的 aza-QM 具有更长的寿命，使其能够与各种亲核试剂反应，并在相对缓慢的 Diels-Alder 反应中形成环加合物。这有利于有机合成中的应用并构建更复杂的氮杂杂环。

该工作不仅可为高效 aza-QM 前体的理性设计提供指导，也是实现 aza-QM 在生物环境中应用的先决条件。

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全文链接：https://doi.org/10.1021/jacs.5c21621

Quinone methides (QMs) are commonly encountered reactive intermediates in the chemistry and photochemistry of phenols. In the past decade, they have regained significant interest owing to their applications in organic synthesis. Aza-quinone methides (aza-QMs) are excellent precursors for

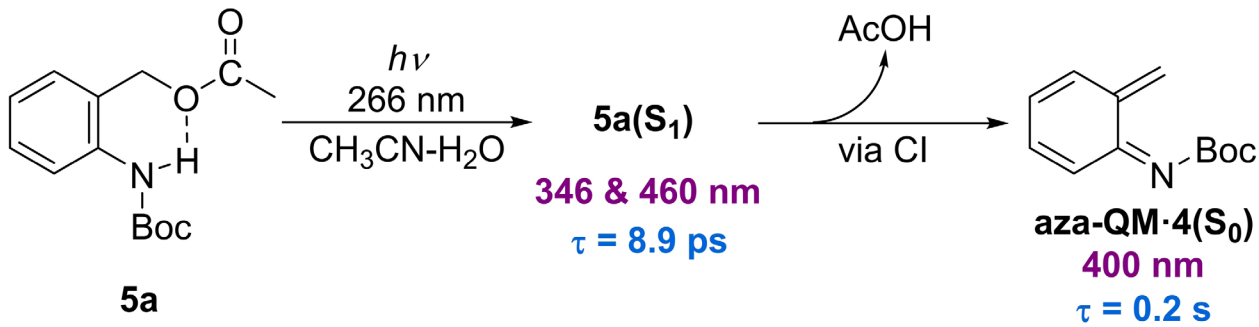

图 2. 5 的光致脱乙酸反应机理
Figure 2. The AcOH photoelimination mechanism from 5

the construction of aza-heterocycles. Nevertheless, the formation of aza-QMs often requires the breaking of aromaticity and proceeds under harsh conditions. The photochemical methods are much milder compared to the thermal since they rely on the use of only photons (no reagents), at ambient temperature, which can be accomplished with spatial and temporal control. Consequently, the photochemical generation of aza-QMs represents an attractive and promising strategy.

o-Hydroxymethylaniline (1) can undergo photodehydration to generate aza-QM. And the quantum yield of the photomethanolysis reaction is high (Φ_R = 0.40). The photochemical formation of aza-QM from 1 was investigated by transient absorption spectroscopy and theoretical calculations, revealing a stepwise mechanism (Figure 1). Upon photoexcitation to the $S_1(\pi\pi^*)$ state, 1 accesses the conical intersection between $S_1(\pi\pi^*)/S_2(n\sigma^*)$, leading to benzylic C–O bond cleavage. However, nonadiabatic population transfer between the ππ* and nσ* states may be inefficient, and the ππ* state exhibits an extended plateau after the conical intersection, resulting in a long-lived contact ion pair, as supported by experimental data. Subsequently, the excited-state contact ion pair returns to the ground state via a conical intersection, and undergoes deprotonation to sequentially generate a carbocation and aza-QM.

To achieve more efficient photochemical generation of aza-QM, we designed N-Boc-O-Ac-aminobenzyl (5) by introducing an N-Boc group and an O-Ac onto 1 (Figure 2). The photomethanolysis of 5 is cleaner and more efficient, and quantum yield of the photomethanolysis reaction is comparable to that of 1 (Φ_R = 0.49). The introduction of the Boc group not only increases the acidity of the NH group but also increases the number of reactive conformations available for elimination, facilitating the concerted elimination of AcOH. Furthermore, compared to the hydroxyl group, the acetyl group serves as a better leaving group. The acetyl group introduces a low-energy nπ* state, providing an additional pathway for ultrafast formation of aza-QM. There are two mechanisms for the cleavage of the C–O bond at the benzylic position. The first mechanism is similar to that of 1, involving a conical intersection between the initially excited ππ* state and the dissociating nσ* state. However, after passing through the $S_1(\pi\pi^*)/S_2(n\sigma^*)$ conical intersection, the steep rise in the energy of the ππ* state promotes more efficient C–O bond cleavage in 5. The second mechanism benefits from an additional nπ* state. Following photoexcitation to $S_1(\pi\pi^*)$, elongation of the benzylic C–O bond stabilizes the $S_3(n\pi^*)$ state, leading to population of $S_1(n\pi^*)$. The molecule accesses the nπ*/nσ* conical intersection, and the C–O bond cleaves. Upon reaching the nσ* state, the benzylic C–O bond breaks, rapidly generating aza-QM via the S_1/S_0 conical intersection. The photochemical generation of aza-QM from 5 is an ultrafast process occurring without detectable intermediates. The resulting aza-QM has a longer lifetime, enabling it to react with various nucleophiles and in relatively slow Diels–Alder reactions forming cycloadducts. This facilitates its application in organic synthesis and the construction of more complex aza-heterocycles.

This work not only provides guidance for the rational design of efficient aza-QM precursors, but also serves as a prerequisite for the application of aza-QMs in biological environments.

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Full Text Link: https://doi.org/10.1021/jacs.5c21621

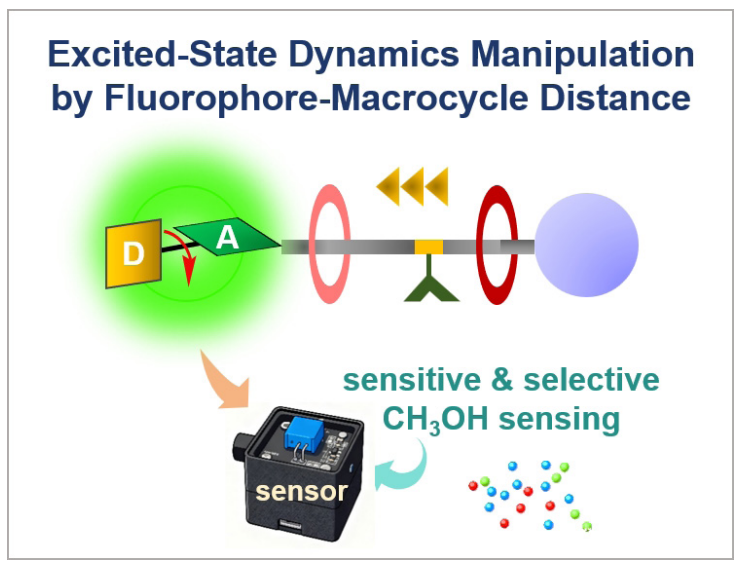
From the journal:
Chemical Science

Manipulating excited-state dynamics through macrocycle positioning in a rotaxane for sensitive and discriminative methanol sensing

Yu Wang, Yalei Ma, Ruijuan Wen, Jing Li, Taihong Liu, Liping Ding, Rong Miao and Yu Fang

机械互锁策略调控激发态动力学：轮烷中大环位置依赖的 TICT 抑制及甲醇灵敏检测

Yu Wang#, Yalei Ma#, Ruijuan Wen, Jing Li, Taihong Liu, Liping Ding, Rong Miao,* and Yu Fang. Chem. Sci., 2026, DOI: https://doi.org/10.1039/d6sc00753h



有机荧光分子激发态的精确调控是光物理与光化学领域的核心目标。光激发后，分子会呈现独特的电子构型，进而触发包括发光效率、反应活性及光稳定性在内的不同动力学过程。尽管目前对基态分子结构与性质之间的关系已有较为系统的认识，但可预测地调控激发态动力学的能力仍然有限。因此，开发有效的策略来引导和调控激发态路径，不仅对于基础理解至关重要，也有助于先进光学材料的理性设计。

本研究提出了一种利用机械互锁结构调控光物理行为与分子识别的超分子策略。通过调控轮烷中二苯并 –24– 冠 –8（D24C8）大环与萘酰亚胺封端基团之间的距离，成功合成了三种萘酰亚胺类轮烷。稳态光谱研究结果表明，冠醚大环的存在降低了荧光团的分子内扭转程度，从而增强荧光发射，且荧光量子产率随大环与

荧光团距离的减小而增大。飞秒瞬态吸收光谱进一步揭示，荧光团中扭转分子内电荷转移（TICT）态的形成速率与轮烷中大环与荧光团之间的距离密切相关：大环距离荧光团越近，TICT 态的形成速率越慢。R–2 轮烷的单晶呈现层状结构，其中大环充当荧光检测中的内在识别位点。基于此，该轮烷薄膜对甲醇蒸气表现出优异的灵敏度与选择性，进一步构建的便携式传感器具备高灵敏度（检测限：0.099% vol）、快速响应（< 3 s）及良好的可重复使用性，成功实现了对掺假饮料中甲醇的检测。本研究证实了机械互锁可以作为一种激发态调控与传感器设计的有效策略。

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全文链接：https://doi.org/10.1039/d6sc00753h

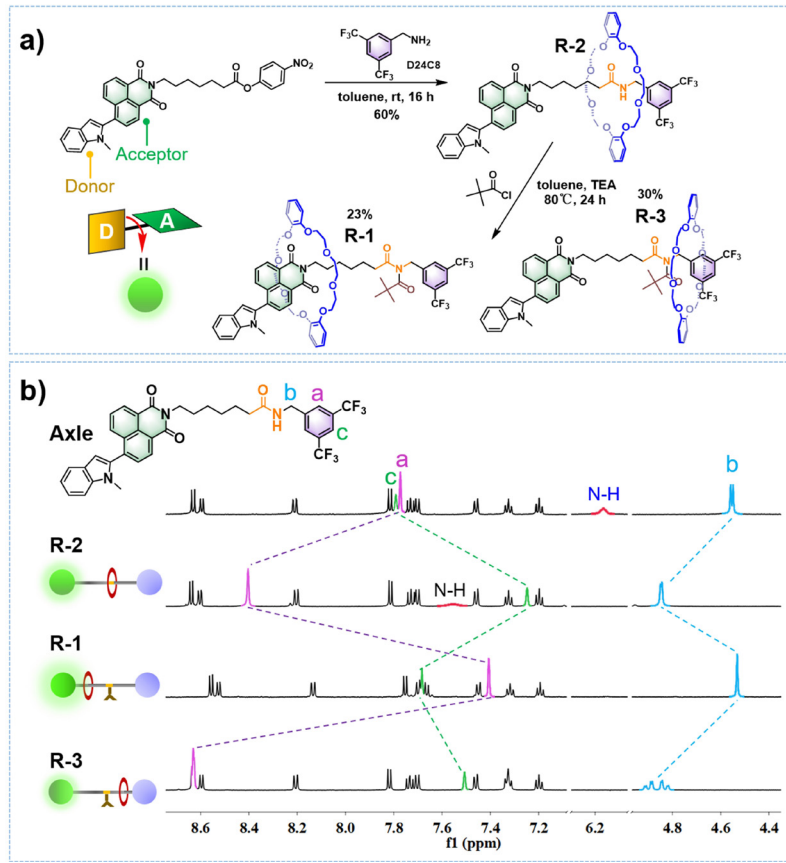

图 1.（a）轮烷（R–1、R–2 和 R–3）的合成路线；（b）分子轴、R–1、R–2 和 R–3 在 CD_2Cl_2 中的部分 ^1H NMR 谱图。

Figure 1. (a) Synthesis route of the rotaxanes (R-1, R-2, and R-3). (b) Partial ^1H NMR spectra of the naked axle, R-1, R-2, and R-3 in CD_2Cl_2.

The precise manipulation of molecular excited states is a central goal in photophysics and photochemistry, as it ultimately dictates the performance of functional materials in applications such as organic light-emitting diodes (OLEDs), solar energy conversion, and optical sensing. Upon photoexcitation, molecules adopt unique electronic configurations that trigger distinct dynamical processes, including luminescence efficiency, reactivity, and photostability. Despite the extensive exploration of ground-state molecular libraries, the ability to predictively control excited-state dynamics remains limited. The development of efficient strategies to direct and modulate these pathways is therefore paramount, not only for fundamental understanding but also for the rational design of advanced optical materials.

In this work, we present a supramolecular strategy utilizing mechanical interlocking to regulate photophysical pathways and molecular recognition. Three rotaxanes were synthesized by positioning a dibenzo-24-crown-8 macrocycle at specific sites along a naphthalimide-based axle. Femtosecond transient absorption spectroscopy revealed that the relaxation of excited-state is critically governed by the spatial separation: the closer the macrocycle to the fluorophore, the slower the twisted intramolecular charge transfer process. Single-crystal of the rotaxane showed a lamellar architecture, where the macrocycle acts as a pre-organized gatekeeper for the fluorophore. Therefore, highly sensitive and selective detection of methanol vapor is realized based on the rotaxane film. In addition, a portable sensor for reliable (< 0.099%vol), rapid (< 3 s), and reusable methanol detection in adulterated beverages is achieved. Our work establishes mechanical interlocking as a versatile approach to excited-state manipulating and sensor design.

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Full Text Link: https://doi.org/10.1039/d6sc00753h

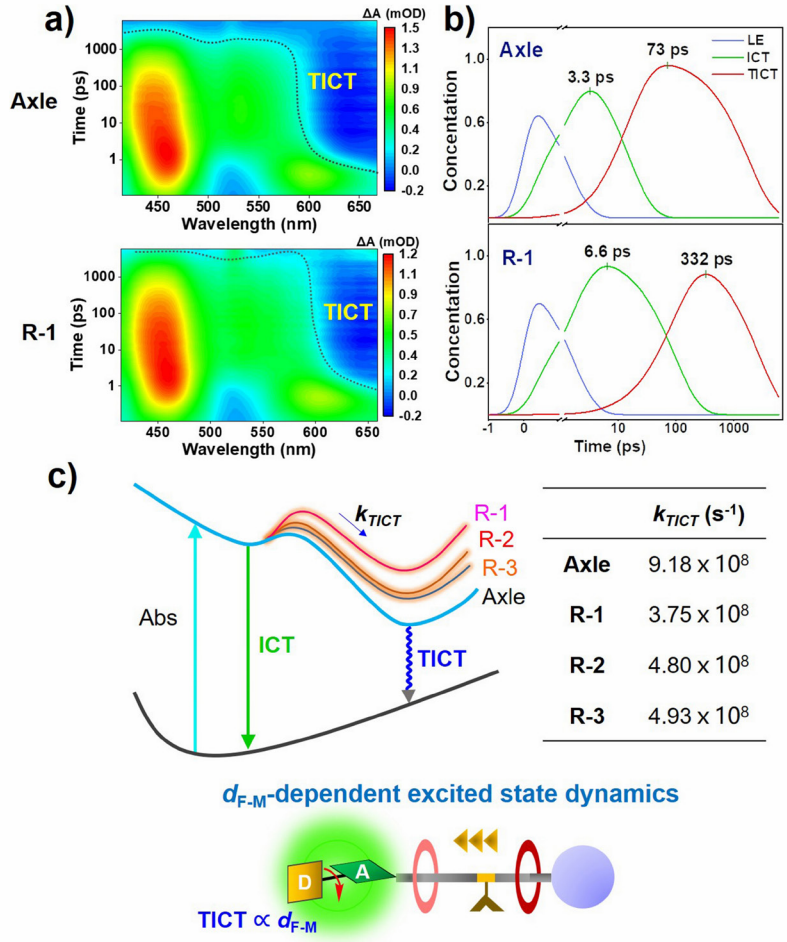


图 2.（a）分子轴和 R−1 在 THF 中的飞秒瞬态吸收等值面图，化合物浓度：5.0 × 10^{-5} M；（b）分子轴和 R−1 中激发态物种（LE、ICT 和 TICT）随时间的分布；（c）四种化合物（Axle、R−1、R−2 和 R−3）的激发态弛豫路径示意图、TICT 态的形成速率常数，以及用于激发态动力学调控的超分子策略示意图，参照 Marcus 理论，$k \propto exp\left(-\frac{(\lambda+\Delta G)^2}{4\lambda k_B T}\right)$，其中 ΔG 表示反应自由能的变化。

Figure 2. (a) The fs-TA pseudo-color maps of the naked axle and R-1 in THF. Compound concentration: 5.0 × 10^{-5} M (b) The distribution of excited-state species (LE, ICT and TICT) in the naked axle and R-1 as a function of time. (c) Schematic illustration of excited-state relaxation pathways of the four compounds (Axle, R-1, R-2, and R-3), the formation rate constant of the TICT state, and the illustration of the supramolecular strategy for excited-state dynamics manipulation. Referring to the Marcus theory, $k \propto exp\left(-\frac{(\lambda+\Delta G)^2}{4\lambda k_B T}\right)$, where "ΔG" represents the change in reaction free energy.

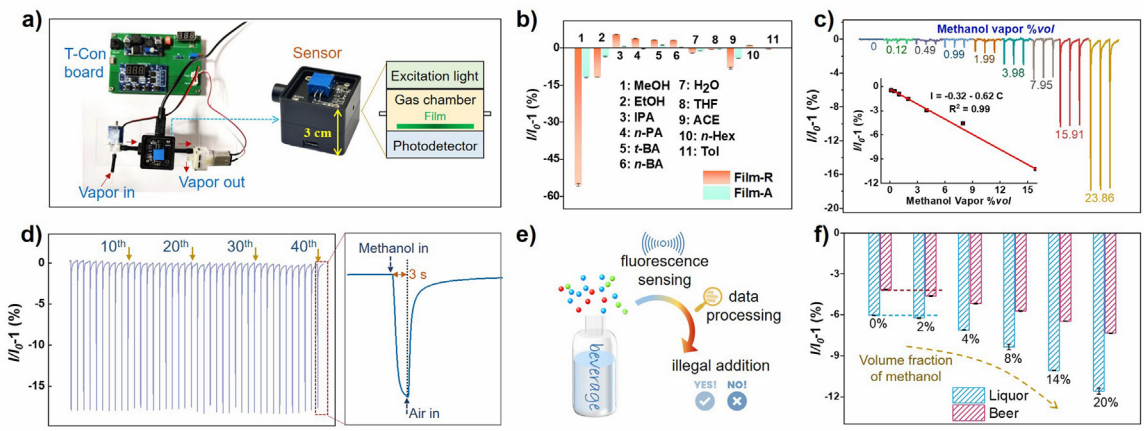
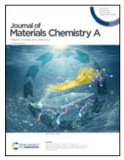


图 3.（a）自制传感平台的照片及便携式传感装置示意图；（b）Film−R 和 Film−A 对不同类型挥发性有机化合物和水的荧光响应，MeOH：甲醇；EtOH：乙醇；IPA：异丙醇；n−PA：正丙醇；t−BA：叔丁醇；n−BA：正丁醇；THF：四氢呋喃；ACE：丙酮；n−Hex：正己烷；Tol：甲苯；（c）Film−R 传感器对不同甲醇浓度（0.12 ~ 23.86%*vol*）蒸气的响应，插图为响应强度与甲醇浓度之间的线性关系；（d）Film−R 传感器对甲醇蒸气（24.24%vol）的四十次可逆传感循环；（e）利用 Film−R 传感器识别非法甲醇添加的示意图；（f）Film−R 传感器对添加了不同量甲醇的白酒（蓝色）和啤酒（红色）的响应。

Figure 3. (a) Photograph of the homemade sensing platform and the detailed layout of the portable sensor device. (b) Fluorescence responses of Film-R and Film-A to different types of volatile organic compounds and water. MeOH: Methanol; EtOH: Ethanol; IPA: Isopropyl alcohol; n-PA: n-Propanol; t-BA: tert-Butyl alcohol; n-BA: n-Butanol; THF: Tetrahydrofuran; ACE: Acetone; n-Hex: n-Hexane; Tol: Toluene (c) Responses of the Film-R sensor to vapors with varied methanol concentrations (0.12 ~ 23.86%*Vol*). The inset plots show the linear relationship between response intensity and methanol concentration. (d) Forty reversible sensing cycles of the Film-R sensor to methanol vapor. (24.24%Vol) (e) Schematic illustration of the identification of illegal methanol addition using the Film-R sensor. (f) Responses of the Film-R sensor to liquor (blue) and beer (red) added with different amounts of methanol.



From the journal:
Journal of Materials Chemistry A

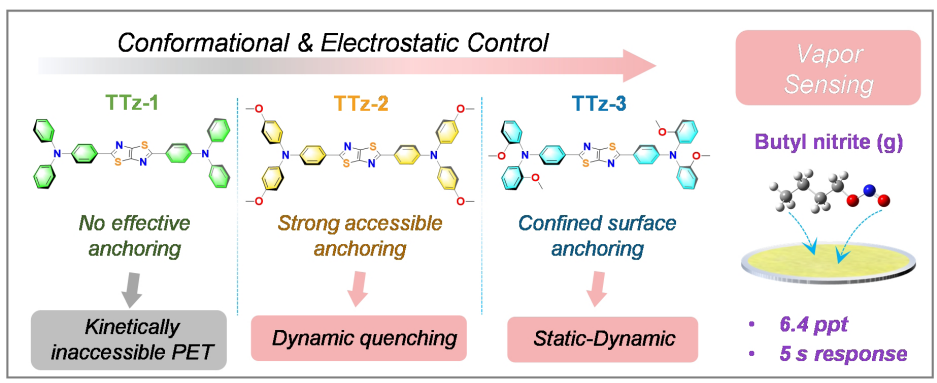
Conformational and electrostatic control of PET in TTz–TPA fluorophores for butyl nitrite vapor sensing

Check for updates

Pan Liu, † [a] Xin Chen, † [a] Chun Yang, † [ab] Helan Zhang, [a] Liping Ding, *[a] Ruijuan Wen, [a] Haonan Peng *[a] and Yu Fang [a]

静电与构象协同调控 PET 过程，实现亚硝酸丁酯蒸气快速灵敏检测

Pan Liu,† Xin Chen,† Chun Yang,† Helan Zhang, Liping Ding*, Ruijuan Wen, Haonan Peng*, Yu Fang. J. Mater. Chem. A: 2026, DOI: 10.1039/D6TA01728B



亚硝酸丁酯是“Rush Poppers”等挥发性亚硝酸酯产品中的典型活性成分，具有挥发性强、扩散快和隐蔽性高等特点，其滥用可能带来公共卫生和公共安全风险。因此，发展可用于现场监测的快速检测方法具有重要意义。荧光薄膜传感器具有响应快、信号直观、易于小型化集成等优势，是挥发性有机物检测的重要方法。

光诱导电子转移（PET）是荧光传感中重要的信号转导过程。对于亚硝酸丁酯这类具有电子接受能力的挥发性分子，探针与分析物之间的能级匹配为 PET 猝灭提供了热力学基础。然而，实际传感响应并不只取决于能级是否合适。分析物能否靠近荧光分子、是否具有合适的接触构型以及相互作用时间是否足够，都会影响 PET 过程能否有效发生。因此，如何通过分子结构设计调控 PET 的动力学可及性，是实现高性能荧光传感的关键。

基于这一认识，研究团队构建了 TTz–TPA 型供体 – 受体 – 供体荧光分子平台。TTz 作为刚性缺电子受体，TPA 作为电子给体并提供可调的螺旋桨状构象。通过在 TPA 外围苯环上引入不同位置的甲氧基取代基，研究团队系统调节了分子的电子云分布、局部静电作用位点和空间可及性，从而控制亚硝酸丁酯与荧光分子的接近方

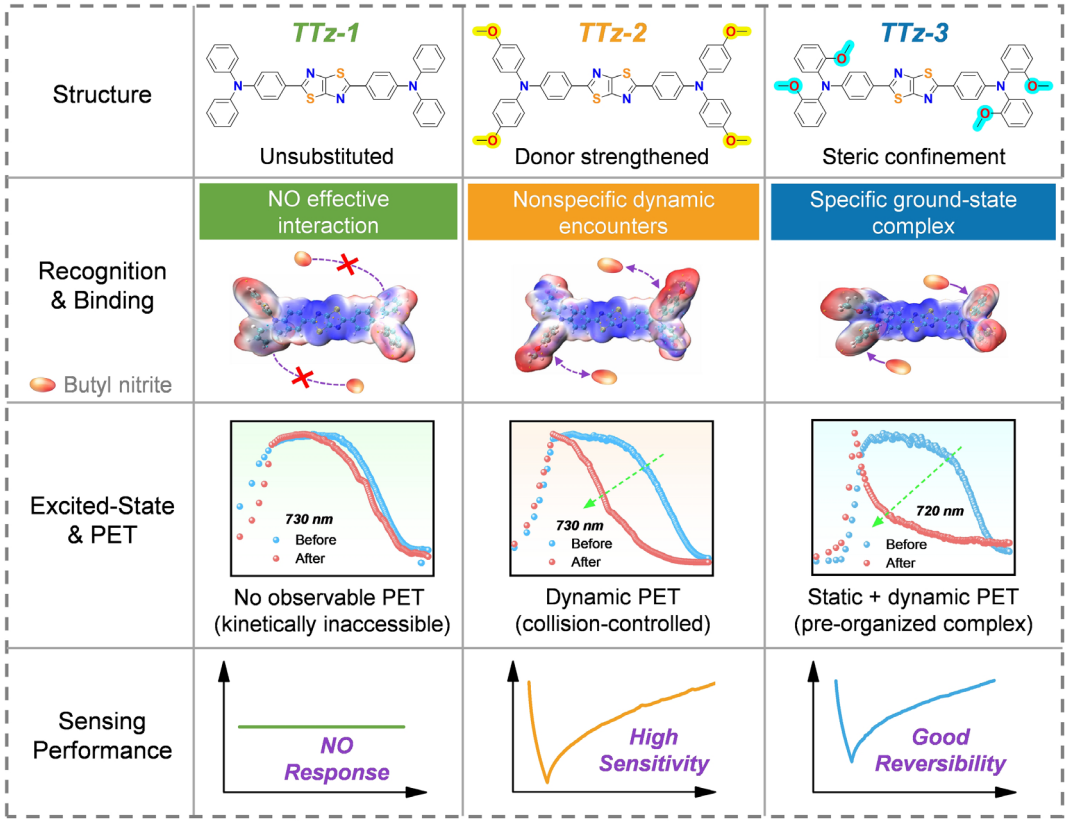


图 1. TTz–TPA 荧光分子中构象调控的 PET 过程及其亚硝酸丁酯传感性能

Figure 1. Conformational regulation of PET in TTz–TPA fluorophores for butyl nitrite sensing.

式及后续 PET 猝灭路径。

研究发现，未取代的 TTz–1 虽然在能级上具备发生 PET 的可能，但由于缺乏有效的局部静电作用位点，难以与亚硝酸丁酯形成有效接近，因而几乎不产生响应；对位甲氧基取代的 TTz–2 增强了分子表面的局部负电势，使亚硝酸丁酯能够通过瞬时接触引发以动态 PET 猝灭为主的荧光响应；邻位甲氧基取代的 TTz–3 则在更强静电作用和构象约束的共同影响下，可与亚硝酸丁酯形成基态缔合物，并表现出静态 – 动态共同参与的 PET 猝灭机制。基于 TTz–2 和 TTz–3 的荧光薄膜均可实现对亚硝酸丁酯蒸气的快速检测，最低可检测浓度达到 6.4 ppt，响应时间约为 5 秒，并表现出良好的可逆性和循环稳定性。该工作将挥发性小分子荧光检测从传统的探针筛选推进到识别动力学调控层面，为面向亚硝酸酯、毒品相关挥发物及其他低浓度风险物质的高性能荧光薄膜传感器设计提供了新的思路。

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全文链接：https://doi.org/10.1039/d6ta01728b

Butyl nitrite is a representative active component of volatile alkyl nitrite products such as “Rush Poppers”. Owing to its high volatility, rapid diffusion, and concealed use, its misuse may pose potential risks to public health and public safety. Therefore, developing rapid detection methods suitable for on-site monitoring is of great significance. Fluorescent film sensors, with the advantages of fast response, visual signal readout, and easy miniaturized integration, represent an important approach for the detection of volatile organic compounds.

Photoinduced electron transfer (PET) is an important signal transduction process in fluorescent sensing. For volatile molecules with electron-accepting ability, such as butyl nitrite, energy-level matching between the probe and the analyte provides the thermodynamic basis for PET quenching. However, the actual sensing response is not determined solely by whether the energy levels are suitable. Whether the analyte can approach the fluorophore, adopt an appropriate contact geometry, and maintain a sufficient interaction time all affect whether the PET process can occur efficiently. Therefore, regulating the kinetic accessibility of PET

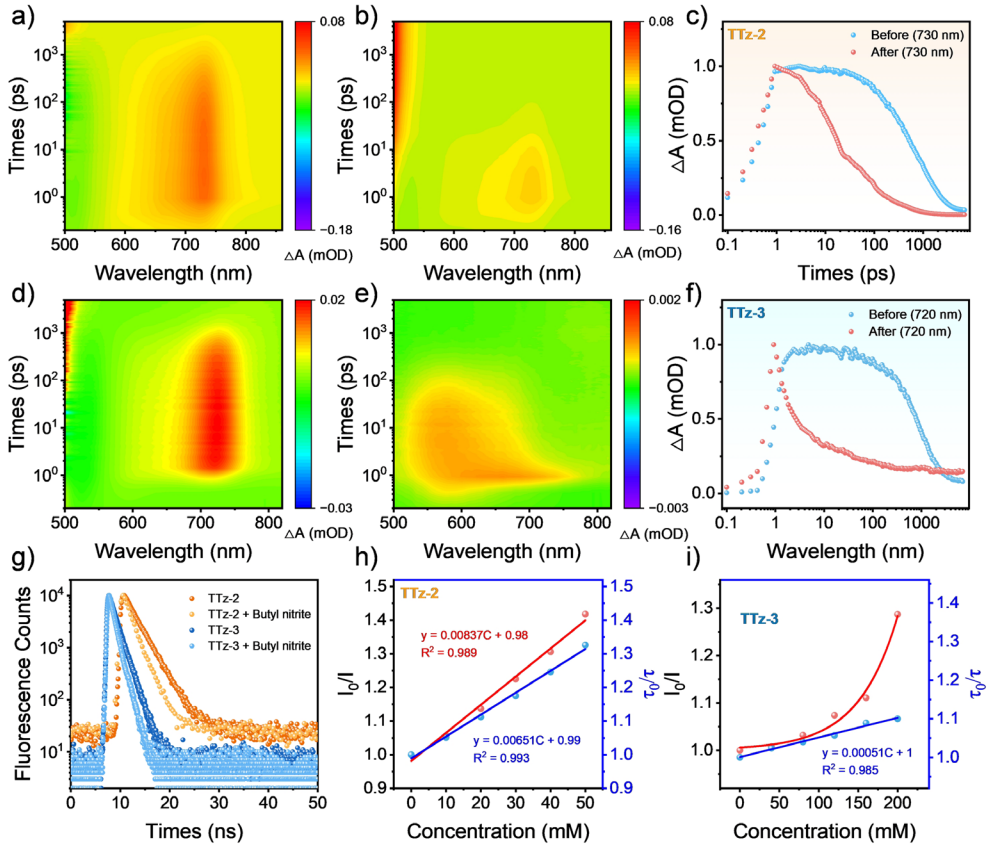

图 2. TTz−2 和 TTz−3 对亚硝酸丁酯响应的激发态动力学及定量猝灭分析

Figure 2. Excited-state dynamics and quenching analysis of TTz-2 and TTz-3 toward butyl nitrite

through molecular structure design is critical for achieving high-performance fluorescent sensing.

Based on this understanding, the research team constructed a TTz–TPA donor–acceptor–donor fluorescent molecular platform. TTz was used as a rigid electron-deficient acceptor, while TPA served as an electron donor with a tunable propeller-like conformation. By introducing methoxy substituents at different positions on the peripheral phenyl rings of TPA, the team systematically modulated the electron-density distribution, local electrostatic interaction sites, and spatial accessibility of the molecules, thereby controlling the approach mode of butyl nitrite to the fluorophore and the subsequent PET quenching pathway.

The study found that although unsubstituted TTz-1 is energetically capable of undergoing PET, it lacks effective local electrostatic interaction sites and therefore cannot form efficient close contact with butyl nitrite, resulting in almost no observable response. Para-methoxy-substituted TTz-2 enhances the local negative electrostatic potential on the molecular surface, allowing butyl nitrite to induce a fluorescence response mainly through dynamic PET quenching via transient encounters. In contrast, ortho-methoxy-substituted TTz-3, under the combined influence of stronger electrostatic interactions and conformational constraints, can form ground-state associates with butyl nitrite and exhibits a mixed PET quenching mechanism involving both static and dynamic processes.

Fluorescent films based on TTz-2 and TTz-3 both enabled rapid detection of butyl nitrite vapor, with a lowest detectable concentration of 6.4 ppt and a response time of approximately 5 s, while also showing good reversibility and cycling stability. This work advances fluorescent detection of volatile small molecules from conventional probe screening toward regulation of recognition kinetics, providing new insights for the design of high-performance fluorescent film sensors for alkyl nitrites, drug-related volatile substances, and other low-concentration hazardous vapors.

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Full Text Link: https://doi.org/10.1039/d6ta01728b

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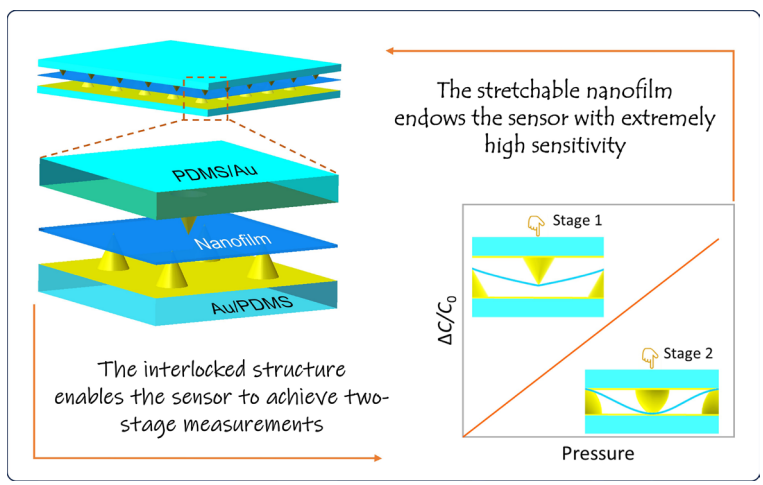
Achieving wide linear range and high sensitivity in capacitive pressure sensors via a stretchable nanofilm with interlocked hierarchy

Binbin Zhai, Yuhan Yang, Junjie Wang, Xinyue Wang, Chi Zhang, Yanyan Luo, Jianfei Ma, Zhi-Hao Zhao* and Yu Fang*

通过可伸缩纳米薄膜和互锁层级结构，实现电容压力传感器的宽线性范围和高灵敏度

Binbin Zhai, Yuhan Yang, Junjie Wang, Xinyue Wang, Chi Zhang, Yanyan Luo, Jianfei Ma, Zhi-Hao Zhao*, Yu Fang*. Sci. China Mater. 2026, DOI: 10.1007/s40843-025-3925-5



随着人工智能、可穿戴电子和物联网的蓬勃发展，柔性压力传感器已成为不可或缺的基础组件，在电子皮肤、健康监测和医疗设备中具有广阔的应用前景。其中，电容式压力传感器（CPS）因其快速动态响应、良好的可重复性、简单的器件结构、低功耗和对温度变化不敏感等显著特性而受到广泛关注。介电层和传感器微结构的微工程是提高传统 CPS 性能的有效方法。然而，如何同时实现宽线性检测范围和高灵敏度，仍是该领域面临的关键挑战。

本研究提出一种新型电容式压力传感器（HI–CPS），通过结合可拉伸聚乙二醇纳米膜介电层与分级互锁微结构，实现了宽检测范围内的高灵敏度与优异线性响应。基于单层纳米膜的 HI–CPS 表现出超高灵敏度（9.40 kPa^{-1}）和极低检测下限（0.1 Pa）。当采用双层堆叠纳米膜作为介电层时，传感器在宽工作范围（< 5 kPa）内仍保持高灵敏度（3.17 kPa^{-1}）和出色线性度（R2 = 0.999），且在 10,000 次循环测试后性能稳定。得益于优异的综合性能，HI–CPS 已成功应用于多种人体生理信号监测、手语识别及篮球投篮姿势矫正。本研究提出的纳米膜定制化与结构工程协同策略，为构建高性能压力传感与识别系统提供了新的可行路径。

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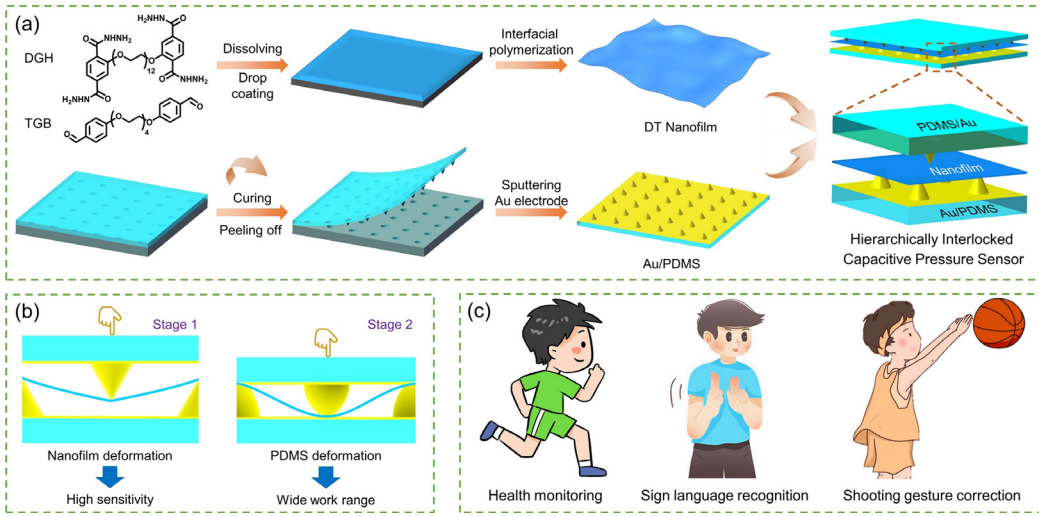

图 1. HI−CPS 的制备、压力响应机理及其应用

Figure 1. Preparation, pressure response mechanism and application of HI-CPS

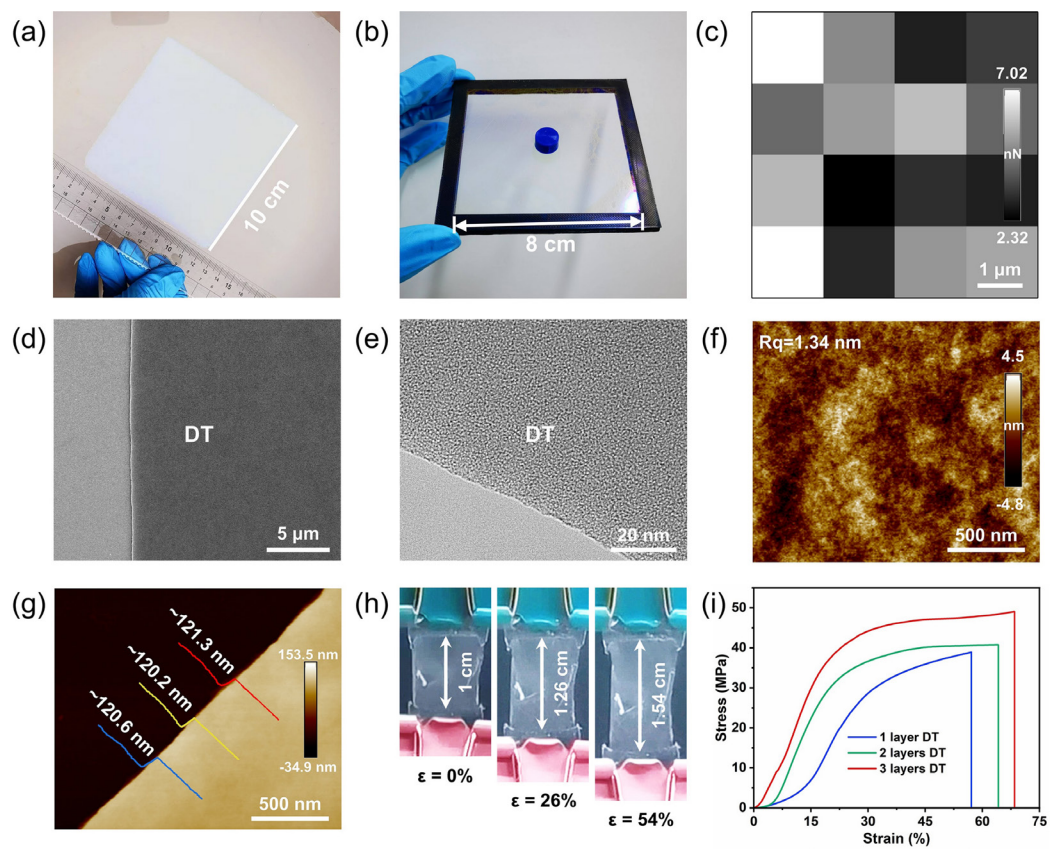

图 2. DT 纳米膜的图像与表征。

Figure 2. Image and characterization of DT nanofilm.

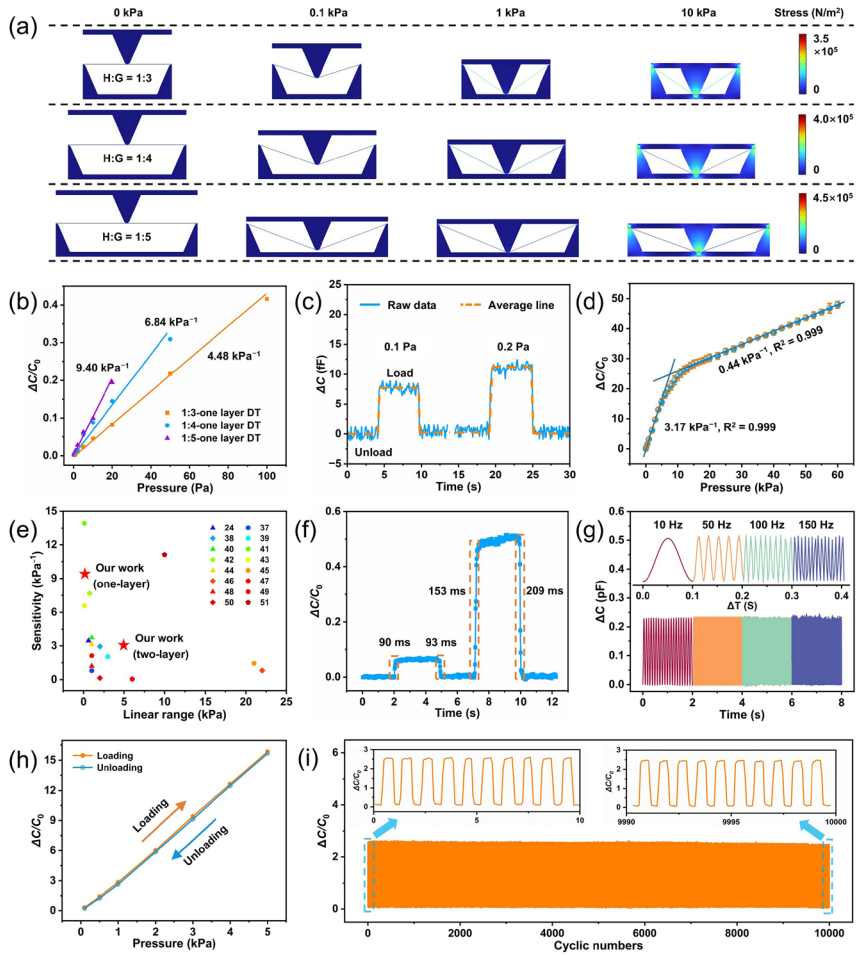

图 3. HI−CPS 的压力响应性能。

Figure 3. Pressure response performance of HI-CPS.

With the flourishing development of artificial intelligence, wearable electronics, and the Internet of Things, flexible pressure sensors have become indispensable as fundamental components, providing broad application prospects in electronic skin, health monitoring, and medical devices. Among these, capacitive pressure sensors (CPS) have attracted extensive attention owing to their remarkable properties like fast dynamic response, good repeatability, simple device structure, low power consumption, and insensitivity to temperature changes. Microengineering of dielectric layers and sensor microstructures is an effective way to enhance the performance of conventional CPS. However, manufacturing capacitive pressure sensors that simultaneously achieve a broad linear detection range and high sensitivity remains a significant challenge.

Herein, a novel hierarchically interlocked capacitive pressure sensor (HI-CPS) was designed by integrating the stretchable polyethylene glycol (PEG)-based nanofilm dielectric layer with hierarchically interlocked microstructures, which demonstrates excellent linearity and high sensitivity over a wide sensing range. HI-CPS based on a one-layer nanofilm exhibits ultrahigh sensitivity (9.40 kPa^{-1}) and an ultralow detection limit (0.1 Pa). When the dielectric layer comprises two layers of stacked nanofilms, the sensor not only maintains high sensitivity (3.17 kPa^{-1}) but also achieves excellent linearity (R2 = 0.999) over a broad working range (<5 kPa), along with remarkable stability even after 10,000 cycles. Benefitting from the outstanding comprehensive performance, HI-CPS has been proven to be successfully implemented in monitoring various human biological signals, sign language recognition, and basketball shooting gesture correction. This strategy of assembling the tailored nanofilm with structural engineering has significant potential application in building high-performance pressure detection and recognition devices.

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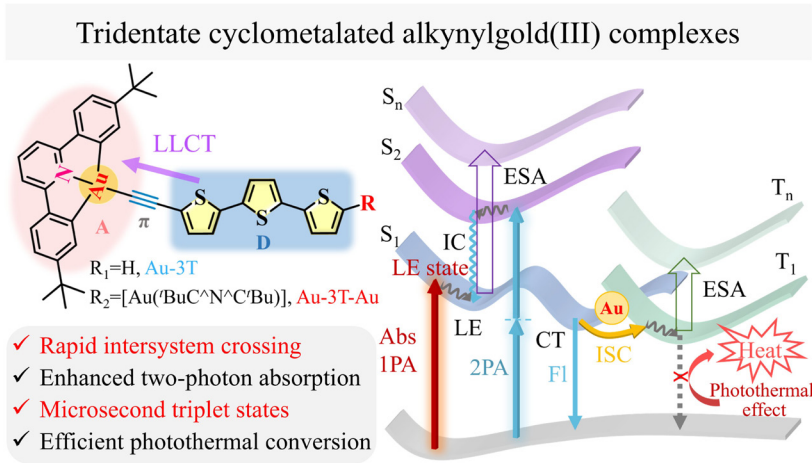
Chinese Chemical Letters
Available online 28 April 2026, 112850
In Press, Journal Pre-proof What's this?

Efficient two-photon absorption and photothermal conversion in terthiophene-conjugated cyclometalated alkynylgold(III) complexes

Xingtong Zhou [a], Xin-Ao Liu [a], Wendan Luo [a], Ke Liu [b] ✉, Taihong Liu [a] ✉, Liping Ding [a], Yu Fang [a]

三联噻吩环金属化炔基金 (III) 配合物的高效双光子吸收和光热转换

Xingtong Zhou, Xin-Ao Liu, Wendan Luo, Ke Liu*, Taihong Liu*, Liping Ding, Yu Fang. Chin. Chem. Lett., 2026, DOI: https://doi.org/10.1016/j.cclet.2026.112850



合成新型金属有机配合物的核心目标之一是实现其激发态动力学可控调控与优异非线性光学性能。本工作对单环金属化炔基金 (III) 配合物 Au–3T 和双环金属化炔基金 (III) 配合物 Au–3T–Au 开展了系统对比研究。具有四偶极构型的 Au–3T–Au 配合物在 560 nm 处具有高达 3980 GM 的双光子吸收截面值，为偶极型同系物 Au–3T 配合物的 6.8 倍。该优异双光子吸收性能归因于配体间电荷转移与 π – 共轭扩展延伸的协同作用。超快动力学测试结果表明，两种配合物在分子内电荷转移 ICT 及系间窜越 ISC 光物理过程中存在显著的能量转换与动力学行为差异。两种配合物均表现出强三重态 – 三重态吸收特征，且激发态寿命处于微秒尺度。ICT 效应与高效 ISC 的协同作用有效抑制了辐射能量损耗，使得两种配合物的光热转化效率分别高达 32.0% 和 42.7%，具

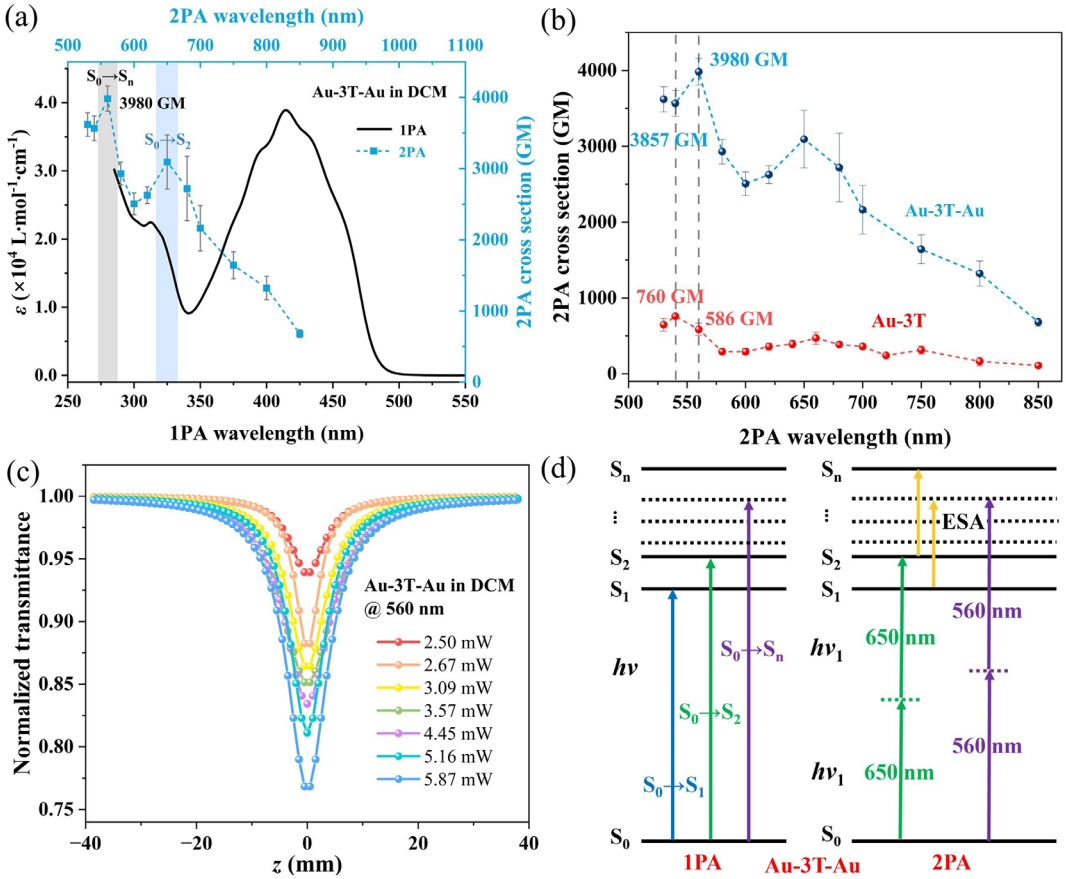


图 1. (a) Au−3T−Au 的 1PA 与 2PA 复合光谱 (c = 1.0 × 10−3 mol/L) 及对应波长的双光子吸收截面值；(b) 配合物在 DCM 溶剂中的双光子吸收截面值；(c) 不同入射激光能量下 Au−3T−Au 的归一化透过率曲线；(d) Au−3T−Au 的 1PA 与 2PA 过程激发态能级对比示意图。

Figure 1. (a) Combined 1PA and 2PA spectra of Au-3T-Au and related δ2PA values in DCM (c = 1.0 × 10-3 mol/L) excited at different fs-wavelengths within 530-850 nm. (b) Degenerate δ2PA values of both complexes in DCM. (c) Normalized transmittance diagram of Au-3T-Au with different laser input values. (d) Compared state energies diagrams of the 1PA and 2PA processes for Au-3T-Au.

备良好的光热应用潜力。本研究既深化了对环金属化炔基金 (III) 配合物本征激发态动力学的认知，又为该类配合物在高性能光热转换领域的应用提供了参考。

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全文链接：https://doi.org/10.1016/j.cclet.2026.112850

A primary objective of synthesizing novel organometallic complexes is to achieve tunable excited-state dynamics and superior nonlinear optical properties. This study systematically and comparatively investigated the mono- and bis-cyclometalated alkynylgold(III) complexes (Au-3T and Au-3T-Au). The quadrupolar Au-3T-Au exhibited a high two-photon absorption cross-section of 3980 GM at 560 nm, 6.8 times that of the dipolar analogue Au-3T, which was attributed to synergistic effect of ligand-to-ligand charge transfer and π-conjugation extension. Ultrafast excited-state dynamics revealed pronounced energetic and kinetic contrast in the underlying intramolecular charge transfer (ICT) and intersystem crossing (ISC) processes. Both complexes exhibited strong triplet-triplet absorption with microsecond-scale lifetimes. The synergistic ICT and efficient ISC effectively suppressed radiative energy loss, resulting in high photothermal conversion efficiencies. This work advances the understanding of intrinsic excited-state dynamics and high-performance photothermal applications in the cyclometalated alkynylgold(III) complexes.

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Full Text Link: https://doi.org/10.1016/j.cclet.2026.112850

马佳妮教授与克罗地亚娜达·多斯利奇教授和尼古拉·巴萨里奇教授开展持续交流合作

Prof. Ma Jiani carries out continuous exchanges and collaboration with Profs. Nadja Doslič and Nikola Basarić of Croatia

近期，陕西师范大学新概念传感器与分子材料研究院马佳妮教授与克罗地亚鲁杰尔·博什科维奇研究所（Institut Ruder Boskovic）的娜达·多斯利奇（Nada Doslic）教授和尼古拉·巴萨里奇（Nikola Basarić）教授的合作工作发表于 Journal of the American Chemical Society（2026, doi.org/10.1021/jacs.5c21621）。

这是双方十余年围绕光致醌甲基前体的理性设计及光化学反应机制研究系列工作的又一进展。此前，双方的合作代表作发表在 Journal of the American Chemical Society（2017, 139, 18349−18357），Journal of Organic Chemistry（2019, 84, 8630−8637；2023, 88, 15176–15188）等期刊，并在 Physical Chemistry Chemical Physics（2025, 27, 15272–17292）发表综述文章。

此前，多斯利奇教授于 2026 年 1 月 16 日应邀来访，与马佳妮教授及课题组的学生进行了学术讨论。多斯利奇教授对研究院的硬件设施和文化建设表示了高度肯定，希望进一步深化双方合作研究工作。巴萨里奇教授已邀请马佳妮教授于今年 7 月赴克罗地亚参加 PhotoIUPAC 国际会议，并作大会邀请报告。

中国驻克罗地亚大使馆科技参赞张晋彬对研究院与鲁杰尔·博什科维奇研究所开展的学术交流和合作研究表示了肯定和鼓励，并将对双方下一步的交流合作给予指导。

Recently, a collaborative work by Prof. Ma Jiani of the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University, along with Professors Nada Doslic and Nikola Basarić of the Ruder Boskovic Institute in Croatia, was published in the Journal of the American Chemical Society (2026, doi.org/10.1021/jacs.5c21621).

This marks another advancement in the series of collaborative research conducted over more than a decade by the two teams on the rational design of photo-quinone methyl precursors and the investigation of their photochemical reaction mechanisms. Previously, their collaborative works were published in journals such as the Journal of the American Chemical Society (2017, 139, 18349–18357), the Journal of Organic Chemistry (2019, 84, 8630–8637; 2023, 88, 15176–15188), and a review article was published in Physical Chemistry Chemical Physics (2025, 27, 15272–17292).

Previously, on January 16, 2026, Prof. Doslic visited the institute and engaged in academic discussions with Prof.r Ma Jiani and students from her research group. Prof. Doslic spoke highly of the institute's facilities and cultural environment, and expressed her desire to further deepen collaboration between the two institutions. Prof. Basarić has invited Prof. Ma to attend the PhotoIUPAC International Conference in Croatia this July and present an invited keynote report.

Zhang Jinbin, Science and Technology Counselor at the Chinese Embassy in Croatia, expressed his approval and encouragement for the academic exchanges and collaborative research between INCSMM and RBI, and will provide guidance on their future exchanges and cooperation.

中航富士达科技股份有限公司一行来访

AVIC Forstar S&T visitors received

2026 年 5 月 13 日下午，中航富士达科技股份有限公司防务事业部部长冯治国一行到访陕西师范大学新概念传感器与分子材料研究院，就介电材料的应用需求与房喻院士进行了座谈交流。

中航富士达科技项目经理李闫及党程云、许琴陪同来访，研究院副院长杨小刚、西安方格分子材料科技有限公司总经理韩鹏、研究院研发工程师何怡楠参加座谈交流。

On May 13, 2026, a delegation from AVIC Forstar S&T Co., Ltd. led by Defense Division director Feng Zhiguo visitrf the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University, where they held discussions with Prof. Fang Yu regarding the application needs of dielectric materials.

AVIC Forstar project manager Li Yan, and Dang Chengyun and Xu Qin, joined Feng in the visit. INCSMM vice dean Yang Xiaogang, Xi'an Fangge Molecular Materials Technology Co., Ltd. General manager Han Peng, and INCSMM R&D Engineer He Yinan participated in the meeting.

房喻院士一行访问中国空间技术研究院西安分院

Fang Yu visits Xi'an Branch of China Academy of Space Technology

2026 年 5 月 14 日下午，陕西师范大学新概念传感器与分子材料研究院房喻院士一行前往中国空间技术研究院西安分院访问，并与西安分院副院长马小飞等相关领导和专家进行了座谈交流。

房喻院士作了题为“面向传感与未来技术的分子材料”的学术报告，并参观了西安分院重点实验室及展厅。

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介绍了西安分院的架构、核心业务与项目需求，双方围绕当前星载天线、太赫兹通信技术等在材料领域面临的核心技术瓶颈与迫切需求进行了座谈交流，并探讨了未来的合作方向。

西安分院四级技术经理翟盛华、研发与产品处处长沈俊，重点实验室书记刘星、重点实验室先进高速数传室副主任朱忠博；研究院副院长丁立平教授、杨小刚老师，彭军霞教授、研发工程师王佩、何怡楠，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，西交大前沿科学技术研究院副院长何刚教授、西安方格分子材料科技有限公司总经理韩鹏参加了座谈交流。

On May 14, 2026, Prof. Fang Yu and his colleagues from the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University visited the Xi'an Branch of the China Academy of Space Technology and held discussions with deputy director Ma Xiaofei as well as other officials and experts from the institute.

Fang Yu delivered a report titled "Molecular Materials for Sensing and Future Technologies" and toured the Key Laboratory and exhibition hall of the Xi'an Branch.

Hui Tengfei, executive deputy director of the National Key Laboratory of Space Microwave Communications at the Xi'an Branch, introduced the branch's organizational structure, core operations, and project requirements. The two sides held discussions on the key technical bottlenecks and urgent needs currently facing the materials field in areas such as space-borne antennas and terahertz communication technology, and explored future directions for cooperation.

Xi'an Branch Level 4 technical manager Zhai Shenghua, R&D and Product Division director Shen Jun; SMC Key Laboratory Party Secretary Liu Xing and Advanced High-Speed Data Transmission Laboratory deputy director Zhu Zhongbo; INCSMM vice deans Prof. Ding Liping and Mr. Yang Xiaogang, Prof. Peng Junxia, R&D Engineers Wang Pei and He Yinan, 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 Xi'an Fangge Molecular Materials Technology Co., Ltd. general manager Han Peng, participated in the discussion and exchange.

第三届边境国门学校“红烛苗圃”青少年交流成长营来院参观

Third Border Gateway School "Red Candle Nursery Garden" Youth Camp visitors received

2026 年 5 月 25 日，第三届陕西师范大学边境国门学校“红烛苗圃”各族青少年交流成长营的 150 余名青少年学生，在带队老师和大学生志愿者的带领下来到新概念传感器与分子材料研究院参观。

研发工程师罗艳彦向同学们介绍了研究院的宗旨理念、首席专家、科研团队等情况，并带领大家参观了科研成果展厅，讲解了研究院的发展历程、承担项目、获得奖项以及成果转化系列产品。

On May 25, 2026, more than 150 students from the 3rd “Red Candle Nursery Garden” Ethnic Youth Exchange and Growth Camp for Border and Gateway Schools of Shaanxi Normal University, accompanied by their teachers and college student volunteers, visited the Institute of New Concept Sensors and Molecular Materials.

R&D Engineer Luo Yanyan introduced the institute’s mission and philosophy, its lead scientist, and research team to the students. She then led them on a tour of the research achievements exhibition room, providing a detailed explanation of the institute’s development history, the projects undertaken, the awards received, and the range of products commercialized from its research.

陕师大附中国际部学生来院科普参观学习

SNNU Affiliated High School students received for science popularization tour

2026 年 5 月 29 日下午，来自陕西师范大学附属中学国际部的近 30 名学生和老师来到陕西师范大学新概念传感器与分子材料研究院，进行科普参观学习，感受科技魅力，感悟科学风采。

房喻院士与同学们合影留念，并勉励同学们努力学习科学知识，打好基础，将来为国家和民族做出贡献。

研发工程师罗艳彦向同学们介绍了研究院基本情况、科研团队、科研概况和发展理念，带领他们参观了研究院成果展厅，讲解了传感器技术在环境监测、医疗健康、国防安全等领域的重要作用，以及房喻院士团队研发的爆炸物探测仪、毒品探测仪等科研成果转化产品。

On May 29, 2026, about 30 students and teachers from the International Division of Shaanxi Normal University Affiliated High School visited Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University a science popularization tour to feel the charm of science and technology.

Prof. Fang Yu posed for a group photo with the students and encouraged them to study hard, build a solid foundation in science, and contribute to the nation and the people in the future.

R&D engineer Luo Yanyan introduced the basic situation, research team, research overview and development concept of the institute to the students, led them to visit the institute's achievements exhibition room, explained the important role of sensor technology in environmental monitoring, medical health, national defense, public security and other fields, and the products such as explosive detection device and illicit drug detection device commercialized from the research results developed by Prof. Fang Yu's group.

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