陕西师范大学 SHAANXI NORMAL UNIVERSITY

化学化工学院 School of Chemistry & Chemical Engineering

新概念传感器与分子材料研究院 INSTITUTE OF NEW CONCEPT SENSORS AND MOLECULAR MATERIALS

新概念传感器与分子材料研究院 简报 06 2024

Institute of New Concept Sensors and Molecular Materials Newsletter

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研究院 2024 届博士和硕士研究生通过学位论文答辩

Class 2024 doctoral and master's students pass dissertations/theses defenses

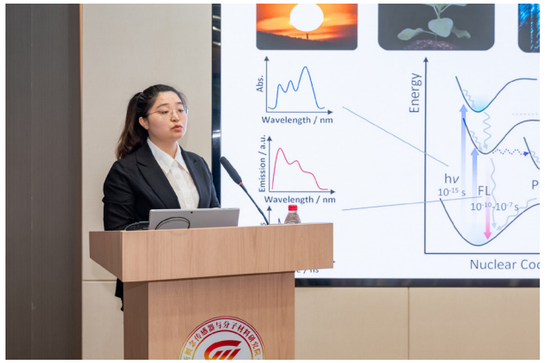
2024 年 6 月 2 日上午，新概念传感器与分子材料研究院分别在研究院报告厅、会议室、致知楼 1568 和致知楼 1668 进行了四场博士和硕士研究生学位论文答辩会，博士研究生张晶、丁南南、张苗苗和 24 名硕士研究生通过了答辩。

在报告厅会场，博士研究生张晶、丁南南、硕士研究生梁晶晶，刘倩倩，史启元进行了答辩，其中张晶的论文题目为“环金属 AuIII– 共轭化合物的设计合成、发光性质与传感应用”的答辩报告，丁南南的论文题目为“芘单酰亚胺功能化邻碳硼烷衍生物的设计合成、光物理性质与应用”。答辩委员由中国科学院化学研究所王树研究员担任主席，中国科学院化学研究所郑企雨研究员，中国科学院西安光机所付玉喜研究员，西安交通大学何刚教授和陕西师范大学唐艳丽教授担任委员，陕西师范大学马佳妮教授担任答辩秘书。

在会议室会场，硕士研究生王挺屹、周志杰、张荣荣、徐婉、张楠、王晓慧、刘璐和刘桂君进行了答辩。答辩委员会由西安交通大学刘峰教授担任主席，西北工业大学田威教授、西北大学曹利平教授、陕西师范大学翟全国教授和中国科学院西安光学精密机械研究所徐耀研究员担任委员，陕西师范大学刘小燕老师担任答辩秘书。

在致知楼 1568 会场，博士研究生张苗苗，硕士研究生王彦清、张伟婷、白亦敏、郭家瑶、王秋平和马雅蕾进行了答辩，其中张苗苗的论文题目为“水系电池电解质溶剂化结构及超快动力学研究”。答辩委员会由西安交通大学丁书江教授担任主席，国家纳米中心段鹏飞研究员、华东师范大学陈缙泉教授、清华大学杨杰教授和陕西师范大学张伟教授担任委员，陕西师范大学彭灵雅老师担任答辩秘书。

在致知楼 1668 会场，硕士研究生陶万胜、刘永康、赵思雨、董妍、周洁、王怡和苏雅娇进行了答辩。答辩委员会由西北大学贾传东教授担任主席，西安交通大学马和平研究员、



高瑞霞教授、西北工业大学闫毅教授和北京宇极科技发展有限公司高级工程师刘东鹏担任委员，陕西师范大学薄鑫老师担任答辩秘书。

答辩汇报之后，各答辩研究生对答辩委员会提出的问题做出了解答，与委员老师讨论了相关问题，并对之后的研究和工作进行了探讨和展望。各答辩委员会一致认为答辩同学们的研究内容充实，回答问题清楚、逻辑清晰，同意通过答辩并授予博士或硕士学位。

On June 2, 2024, the Institute of New Concept Sensors and Molecular Materials conducted four doctoral and master's dissertation/thesis defenses in the INCSMM Building Lecture Hall, Meeting Room, Zhi Zhi Building 1568 and 1668, and doctoral students Zhang Jing, Ding Nannan, Zhang Miaomiao and 24 master's students passed the defenses.

In the Lecture Hall of INCSMM Building, doctoral students Zhang Jing and Ding Nannan, and master's students Liang Jingjing, Liu Qianqian and Shi Qiyuan defended their dissertations and theses. Among them, Zhang Jing's dissertation is titled "Design and synthesis of cyclic metal AuIII-conjugated compounds, luminescent properties and sensing applications", and Ding Nannan's dissertation is titled "Design and synthesis, photophysical properties and applications of perylene monoimide

functionalized o-carborane derivatives". The defense committee was chaired by Prof. Wang Shu from Institute of Chemistry, Chinese Academy of Sciences, with Prof. Zheng Qiyu from CAS Institute of Chemistry, Prof. Fu Yuxi from CAS Xi'an Institute of Optics and Precision Mechanics, Prof. He Gang from Xi'an Jiaotong University, and Prof. Tang Yanli from Shaanxi Normal University as members, and Prof. Ma Jiani from Shaanxi Normal University was the secretary of the defense.

In the meeting room of INCSMM Building, master's students Wang Tingyi, Zhou Zhijie, Zhang Rongrong, Xu Wan, Zhang Nan, Wang Xiaohui, Liu Lu and Liu Guijun defended their theses. The defense committee was chaired by Prof. Liu Feng from Xi'an Jiaotong University, with Prof. Tian Wei from Northwestern Polytechnical University, Prof. Cao Liping from Northwestern University, Prof. Zhai Quanguo from Shaanxi Normal University and Prof. Xu Yao from CAS Xi'an Institute of Optics and Precision Mechanics as members, and Dr. Liu Xiaoyan from Shaanxi Normal University was the secretary of the defense.

In meeting room 1568 of Zhi Zhi Building, doctoral student Zhang Miaomiao, and master's students Wang Yanqing, Zhang Weiting, Bai Yimin, Guo Jiayao, Wang Qiuping and Ma Yalei defended their dissertations and theses. The title of Zhang Miaomiao's thesis is "Solvation structure and ultrafast kinetics of aqueous battery electrolytes". The defense committee was chaired by Prof. Ding Shujiang of Xi'an Jiaotong University, with Prof. Duan Pengfei of National Nano Center, Prof. Chen Jinquan of East China Normal University, Prof. Yang Jie of Tsinghua University, and Prof. Zhang Wei of Shaanxi Normal University as members, and Dr. Peng Lingya of Shaanxi Normal University was the secretary of the defense.

In meeting room 1668 of Zhi Zhi Building, master's students Tao Wansheng, Liu Yongkang, Zhao Siyu, Dong Yan, Zhou Jie, Wang Yi and Su Yajiao defended their theses. The defense committee was chaired by Prof. Jia Chuandong of Northwest University, with Prof. Ma Heping and Prof. Gao Ruixia of Xi'an Jiaotong University, Prof. Yan Yi of Northwestern Polytechnical University, and Liu Dongpeng, Senior Engineer of Beijing Yuji Science and Technology Development Co., Ltd. as members, and Dr. Bo Xin of Shaanxi Normal University was the secretary of the defense.

After the defense reports, the graduate students answered the questions raised by defense committee members , discussed with them the relevant issues as well as future research work and prospects. The defense committee unanimously agreed that all the defending students' research contents were substantial, and their answers to the questions were clear and logical, and agreed to pass their defenses and confer them doctoral or master's degrees.

房喻院士出席中国教育学会科学教育分会 2024 年学术年会并作报告

Fang Yu speaks at 2024 Conference of Science Education Branch of Chinese Society of Education

2024 年 6 月 6 日至 9 日，中国教育学会科学教育分会 2024 年学术年会在西安举行，房喻院士出席会议并作题为《从基础研究的重要性看科学教育与人才培养》的特邀专家报告。

在报告中，房喻院士从基础研究的角度讲述了科学教育与人才培养的重要性，强调了基础研究对于国家科技事业发展的重要作用，指出基础研究容不得急功近利，需要包容个性文化、鼓励创新的土壤，重视科学教育对于孕育志存高远的科学家意义重大。

会议由中国教育学会科学教育分会主办，材料科学与工程学院与现代教学技术教育部重点实验室联合承办，西安高新区实验小学协办，旨在促进我国科学教育的理论发展，加强科学教育学者之间的交流与合作，并为科学教育的未来发展指明方向。

来自全国各地高等院校科学教育专业教师、研究人员和管理者、中小学科学教师、教研员、硕士、博士研究生及其他科学教育工作者等 300 余人参加了会议。

From June 6 to 9, 2024, the 2024 Annual Conference of Science Education Branch of the Chinese Society of Education was held in Xi'an, and Prof. Fang Yu attended the conference and gave an invited report titled "Science education and talent cultivation: From the importance of basic research".

In the report, Fang Yu explained the importance of science education and talent cultivation from the perspective of basic research, stressed the important role of basic research for the development of national scientific and technological undertakings, arguing that basic research has no room for quick success or quick profit, and it needs to embrace the culture of individuality and encourage the soil of innovation, and priority on science education is significant for breeding scientists with high aspirations.

Sponsored by the Science Education Branch of the Chinese Society of Education, organized by the School of Materials Science and Engineering and the Key Laboratory of Modern Teaching Technology of the Ministry of Education, and co-organized by Xi'an Hi-Tech Development Zone Experimental Primary School, the conference aims to promote the theoretical development of science education in China, strengthen the communication and cooperation among scholars of science education, and point out a direction for the future development of science education.

More than 300 people attended the conference, including teachers, researchers and administrators specializing in science education in colleges and universities, primary and secondary schools, master's and doctoral students, and other science educators from across China.

研究院团队获“挑战杯”2024 陕西省赛金银铜奖

INCSMM teams win Gold, Silver and Bronze awards in “Challenge Cup” 2024 Shaanxi Competition

式含氯气体薄膜荧光检测仪》项目（团队学生：王俊杰、苟欣瑜等，指导教师：刘太宏等）荣获银奖；《化“危”神探——国内首创荧光薄膜安防探测器》项目（团队学生：丁南南、张晶、周志杰、翟宾宾等，指导教师：彭浩南、丁立平等）荣获铜奖。

本届赛事由陕西团省委、省委教育工委、省国资委、省科协、省学联、西咸新区管委会主办，西北农林科技大学承办，共有 87 所高校的 1071 件作品报名参赛，最终评选出金奖 94 件，银奖 220 件，铜奖 334 件。

2024 年 6 月 7 日，新概念传感器与分子材料研究院团队三支参赛队伍在第十二届 “挑战杯”陕汽集团陕西省大学生创业计划竞赛上取得 1 项金奖、1 项银奖和 1 项铜奖的优异成绩，获奖等次和数量均创研究院“挑战杯”省赛成绩历史新高。

其中《“膜”法护盾——助力守护空间环境的新型透气膜开创者》项目（团队学生：刘向泉、胡定芳等；指导教师：彭军霞、王佩、房喻等）荣获金奖；《氯感卫士——新型便携

On June 7, 2024, the three participating teams of the Institute of New Concept Sensors and Molecular Materials won one gold award, one silver award and one bronze award in the 12th “Challenge Cup” Shaanxi Automobile Group Shaanxi University Student Entrepreneurship Plan Competition, and the grade and number of awards reached a new high in the history of the Institute's “Challenge Cup” provincial competition.

Among them, the project Magic “Membrane” Shield - A New Breathable Membrane Environment Protector” (Team students: Liu Xiangquan, Hu Dingfang, etc.; Instructors: Peng Junxia, Wang Pei, Fang Yu, etc.) won the gold award; the project “Chlorine Sensing Guardian - A New Portable Film Fluorescent Detector for Chlorine-containing Gas” (Team students: Wang Junjie, Gou Xinyu, etc., Instructor: Liu Taihong, etc.) won the silver award; The project “Danger Detector - The First Film Fluorescent Security Detector in China” (Team students: Ding Nan Nan, Zhang Jing, Zhou Zhijie, Zhai Binbin, etc., Instructors: Peng Haonan, Ding Liping, etc.) won the bronze award.

The competition was sponsored by Shaanxi Youth League Provincial Committee, Education Work Committee of CPC Shaanxi Provincial Committee, Shaanxi State-owned Assets Supervision and Administration Commission, Shaanxi Science and Technology Association, Shaanxi Students' Federation, Xixian New District Management Committee, and hosted by Northwest A&F University. A total of 1071 entries from 87 colleges and universities entered the competition, and 94 gold awards, 220 silver awards and 334 bronze awards were finally selected.

研究院六位 2024 届硕士毕业生继续攻读博士学位

Six Class 2024 master's students to pursue doctorate

近日，新概念传感器与分子材料研究院 2024 届硕士研究生通过学位论文答辩，其中王彦清、刘璐和苏雅娇将分赴中国科学技术大学、东南大学和北京理工大学攻读博士学位；马雅蕾和谭淑文将在陕西师范大学继续攻读博士学位；周志杰获国家留学基金委 CSC 资助将赴法国图卢兹大学攻读博士学位。

六位硕士毕业生在校期间均得到了较为全面系统的科研训练，取得不错的研究成果和奖项。王彦清以第一作者身份在 Angewandte Chemie International Edition 期刊发表 SCI 论文 1 篇；刘璐以共同第一作者身份在 The Journal of Physical Chemistry B 期刊发表论文 1 篇；马雅蕾和苏雅娇分别在 Macromolecular Rapid Communications 和 Advanced Functional Materials 期刊发表论文各 1 篇；周志杰在 Aggregate 期刊发表论文 1 篇。

Recently, the Class 2024 master's students of the Institute of New Concept Sensors and Molecular Materials passed their thesis defense. Among them, Wang Yanqing, Liu Lu and Su Yajiao will go to the University of Science and Technology of China, Southeast University and Beijing Institute of Technology respectively to pursue doctoral degrees; Ma Yalei and Tan Shuwen will continue to pursue their doctorate at Shaanxi Normal University;

and Zhou Zhijie will go to the University of Toulouse in France to study for a doctorate with the support of China Scholarship Council.

These six graduate graduates have received relatively comprehensive and systematic training in research during their master's program, and have achieved good research results and won awards. Wang Yanqing has published one SCI paper in Angewandte Chemie International Edition as the first author; Liu Lu has published one paper as co-first author in The Journal of Physical Chemistry B; Ma Yalei and Su Yajiao have published one paper each in Macromolecular Rapid Communications and Advanced Functional Materials, and Zhou Zhijie has published one paper in Aggregate.

房喻院士亮相陕西师范大学 2024 年本科生招生宣传片

Fang Yu featured in 2024 undergraduate enrollment video of Shaanxi Normal University

2024 年 6 月 10 日，陕西师范大学 2024 年本科生招生宣传片《每一步，都算数》发布，房喻院士在三个章节中的第二章《定义》与化学化工学院 2020 级化学专业本科生李重洋（公费师范生）一起出镜，为学生成长为一名好老师指明方向。

On June 10, 2024, Shaanxi Normal University released the promotional video for 2024 undergraduate enrollment - "Every Step Counts". Prof. Fang Yu appeared in the second chapter "Definition" of the three-chapter video with Li Chongyang, a Class 2024 undergraduate student majoring in Chemistry of the School of Chemistry and Chemical Engineering (government-sponsored teacher-training student), pointing out the direction for students to grow into a good teacher.

研究院师生参加中国化学会第 34 届学术年会

INCSMM teachers and students attend 34th Annual Conference of Chinese Chemical Society

2024 年 6 月 15 至 18 日，房喻院士及新概念传感器与分子材料研究院师生参加了在广州举行的中国化学会第 34 届学术年会。

房喻院士在无机化学前沿分会作了题为“面向器件的敏感分子材料创制—以薄膜荧光传感器为例”的分会特邀报告；在 Wiley Chemistry Forum 作了题为“Film-based Fluorescent Sensors: From Concepts to Real-life Applications”的邀请报告。

研究院教师丁立平、刘静、刘忠山、边红涛、刘凯强、薛东旭等分别作了分会口头报告。

此次年会以“迈向更高水平的化学研究”为主题，共设立学术分会 70 个，特色论坛 14 个，同时设立新技术、新产品与新仪器大型成果展览。

From June 15 to 18, 2024, Prof. Fang Yu and teachers and students of the Institute of New Concept Sensors and Molecular Materials attended the 34th Annual Conference of the Chinese Chemical Society in Guangzhou.

Fang Yu gave an invited report titled "Creation of Device-oriented Sensitive Molecular Materials - Taking Film-based Fluorescence Sensors as an Example" at the Inorganic Chemistry Frontier session, and an invited presentation titled "Film-based Fluorescent Sensors: From Concepts to Real-life Applications" at the Wiley Chemistry Forum.

INCSMM faculty members Ding Liping, Liu Jing, Liu Zhongshan, Bian Hongtao, Liu Kaiqiang and Xue Dongxu gave oral reports respectively.

Themed "Towards a higher level of chemical research", the annual conference runs 70 academic sessions, 14 special forums, and a large-scale exhibition of new technologies, new products and new instruments.

团队在 Chem. Soc. Rev. 发表综述：薄膜荧光传感中的分子设计与材料构筑

INCSMM team publishes review in Chem. Soc. Rev.: Molecular design and architectonics towards film-based fluorescent sensing

近日，陕西师范大学新概念传感器与分子材料研究院房喻院士团队在 Chemical Society Reviews 上发表了薄膜荧光传感的分子设计与材料构筑相关综述文章，黄蓉蓉博士为第一作者，房喻教授、丁立平教授及新加坡科技设计大学刘晓刚教授为通讯作者。

房喻教授、丁立平教授，联合新加坡科技设计大学刘晓刚教授等人，共同撰写综述性文章，系统回顾了过去二十多年来薄膜荧光传感领域的研究进展，重点介绍了荧光分子设计和活性层结构调控方面的代表性成果。该综述详细介绍了几类常用的有机荧光小分子，以及与传感过程相关的激发态过程。同时，还深入探讨了六种不同的薄膜材料制备技术和策略，分析了各自的优缺点。此外，该综述还讨论了薄膜光稳定性和基质效应对薄膜荧光传感器传感性能的影响。最后，作者进一步展望了这一新兴领域未来发展面临的机遇和挑战。

Chemical Society Reviews 是英国皇家化学会出版的一本顶尖期刊，发表高影响力、高权威性和高可读性的综述论文。从 1947 年创办的前身 Quarterly Review of the Chemical Society 算起，Chemical Society Reviews 在这 70 多年里发表了许多影响深远的综述论文，已经成为化学科学领域最具影响力和认可度的期刊之一，同时在所有科技期刊中也长期稳居各种影响力指标排名前列。

Recently, the research group led by Prof. Fang Yu of the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University published a comprehensive review article on the molecular design and materials construction of film-based fluorescent sensors in Chemical Society Reviews. Dr. Huang Rongrong is the first author, and the corresponding authors are Prof. Fang Yu, Prof. Ding Liping, and Prof. Liu Xiaogang from the Singapore University of Technology and Design.

Prof. Fang Yu, Prof. Ding Liping, in collaboration with Prof. Liu Xiaogang from the Singapore University of Technology and Design, have jointly authored a comprehensive review article, systematically reviewing the research progress in the field of FFSs over the past twenty years. The review focuses on introducing representative achievements in the design of fluorescent molecules and active layer structures engineering. This review elaborates on several commonly used organic fluorescent small molecules and the excited state processes relevant to sensing processes. Additionally, it delves into six different film material preparation techniques and strategies, analysing their respective advantages and disadvantages. Furthermore, the review discusses the impact of film photostability and substrate effects on the sensing performance of FFSs. Finally, the authors provide further insights into the opportunities and challenges in this emerging field.

Chemical Society Reviews is a top journal published by the Royal Society of Chemistry in the United Kingdom, featuring high-impact, authoritative, and readable review papers. Starting from its predecessor Quarterly Review of the Chemical Society established in 1947, Chemical Society Reviews has published many influential review papers over the past 70 years, growing to become one of the most influential and recognized journals in the field of chemical science, consistently ranking at the forefront of various impact metrics among all scientific journals.

房喻院士参加微纳器件与系统创新论坛并作主题报告

Fang Yu speaks at Micron and Nano Devices and Systems Innovation Forum

2024 年 6 月 22 至 23 日，微纳器件与系统创新论坛（2024）暨中国微米纳米技术学会微纳技术应用创新系列大会在西安市召开，房喻院士应邀参会并作题为《敏感材料创新与 CBRN 传感器——以薄膜荧光传感器为例》的主题报告。

本次论坛由中国微米纳米技术学会、西安交通大学、精密微纳制造技术国家重点实验室主办，由段文晖院士、蒋庄德院士担任论坛主席，全国 300 多位从事微米纳米器件研究和分析测试相关科研工作的专家学者参会。

From June 22 - 23, 2024, Micron and Nano Devices and Systems Innovation Forum (2024) and Micron and Nano Technology Application Innovation Conference of Chinese Society of Micron and Nanotechnology was held in Xi'an, and Prof. Fang Yu was invited to attend the forum and gave a keynote speech titled “Sensitive Material Innovation and CBRN Sensors - Taking Film-based Fluorescence Sensors as an Example”.

The forum was sponsored by the Chinese Society of Micron and Nanotechnology, Xi’an Jiaotong University and the State Key Laboratory of Precision Micron-Nano Manufacturing Technology. Chinese Academy of Sciences Academician Duan Wenhui and Chinese Academy of Engineering Academician Jiang Zhuangde served as the co-chairman of the forum. More than 300 experts and scholars in the research and analysis and testing of micron and nano devices attended the forum.

房喻院士参加中国科学院第二十一次院士大会

Fang Yu attends 21st General Assembly of Academicians of the Chinese Academy of Science

2024年6月24日，全国科技大会、国家科学技术奖励大会和中国科学院第二十一次院士大会、中国工程院第十七次院士大会 24 日上午在人民大会堂隆重召开。中共中央总书记、国家主席、中央军委主席习近平出席大会，为国家最高科学技术奖获得者等颁奖并发表重要讲话。房喻院士参加了会议。

On June 24, 2024, President Xi Jinping, also general secretary of the Communist Party of China Central Committee and chairman of the Central Military Commission, attended a meeting conflating the National Science and Technology Conference, the National Science and Technology Award Conference, the 21st General Assembly of Academicians of the Chinese Academy of Sciences, and the 17th General Assembly of Academicians of the Chinese Academy of Engineering at the Great Hall of the People in Beijing, presented medals and certificates for China’s top science and technology award to laureates and delivered an important speech. Prof. Fang Yu attended the conference.

张晶获东方胶化杯研究生优秀成果奖二等奖

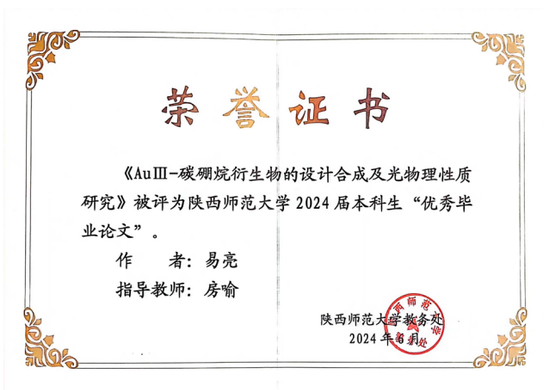
Zhang Jing wins second prize of the Oriental Gelatin Cup Graduate Student Achievement Award

2024 年 6 月 15 日上午，新概念传感器与分子材料研究院博士研究生张晶在广州举行的中国化学会第 34 届学术年会第 40 分会——胶体与界面化学分会开幕式上，获得中国化学会胶体与界面化学专业委员会第 22 届“东方胶化杯”胶体与界面化学研究生优秀成果奖二等奖。

On June 15, 2024, Zhang Jing, a doctoral candidate in the Institute of New Concept Sensors and Molecular Materials, was awarded the second prize of the 22nd “Oriental Gelatinization Cup” Colloidal and Iinterfacial Chemistry Graduate Student Outstanding Achievement Award of Colloidal and interfacial Chemistry Professional Committee of Chinese Chemical Society, at the opening ceremony of Colloidal and Interfacial Chemistry Session of the 34th Annual Conference of the Chinese Chemical Society held in Guangzhou.

易亮毕业论文被评为陕西师范大学 2024 届本科生“优秀毕业论文”

Yi Liang’s thesis awarded "Excellent Graduation Thesis" for Class 2024 SNNU undergraduates



2024 年 6 月，新概念传感器与分子材料研究院本科生易亮同学的毕业论文《Au 111—碳硼烷衍生物的设计合成及光物理性质研究》（指导教师为房喻教授）被评为陕西师范大学 2024 届本科生“优秀毕业论文”。

In June 2024, the graduation thesis “Au 111 - Design, Synthesis and Photophysical Properties of Carbborane Derivatives” by Yi Liang, an undergraduate student of the Institute of New Concept Sensors and Molecular Materials (supervised by Prof. Fang Yu), was awarded as an “Excellent Graduation Thesis” for Class 2024 Shaanxi Normal University undergraduates.

王彦清学位论文被评为陕西师范大学优秀硕士论文

Wang Yanqing’s thesis awarded 2024 SNNU “Excellent Master’s Thesis”

2024 年 6 月，新概念传感器与分子材料研究院硕士研究生王彦清的硕士学位论文《手性铂（Ⅱ）配合物的可控组装及发光性能调控研究》（导师为刘静教授）被评为 2024 年度陕西师范大学优秀硕士学位论文。

In June 2024, the thesis “Study on Controlled Assembly and Luminescence Regulation of Chiral Platinum (II) Complex” by Yanqing Wang, a master’s student of the Institute of New Concept Sensors and Molecular Materials (supervised by Prof. Liu Jing), was awarded as an “Excellent Master’s Thesis” for Class 2024 Shaanxi Normal University graduate students.

张晶学位论文被评为陕西师范大学优秀博士学位论文

Zhang Jing’s dissertation awarded SNNU 2024 “Excellent Doctoral Dissertation”

2024 年 6 月，新概念传感器与分子材料研究院博士研究生张晶同学的《金属 Au111—共轭化合物的设计合成、发光性质与传感应用》（指导教师为房喻教授）被评为 2024 年陕西师范大学优秀博士学位论文。

In June 2024, the dissertation titled “Metal Au111 Conjugated Compounds - Design and Synthesis, Luminescent Properties and Sensing Applications” of Zhang Jing (supervised by Prof. Fang Yu), a doctoral student of the Institute of New Concept Sensors and Molecular Materials, was awarded the Excellent Doctoral Dissertation of Shaanxi Normal University in 2024.

研究院博士生获中国化学会第 34 届学术年会优秀墙报奖

Doctoral students win Excellent Poster Award of 34th CCS Annual Conference

2024 年 6 月 18 日下午，在中国化学会第 34 届学术年会闭幕式上，新概念传感器与分子材料研究院博士研究生张晶获得第 40 分会——胶体与界面化学优秀墙报奖，博士研究生胡定芳获得第 70 分会——功能材料化学分会优秀墙报奖。

On June 18, 2024, at the closing ceremony of the 34th annual conference of Chinese Chemical Society, doctoral students Zhang Jing and Hu Dingfang of the Institute of New Concept Sensors and Molecular Materials won excellent poster awards at the 40th parallel session, the Colloid and Interfacial Chemistry, and the 70th parallel session, the Functional Material Chemistry, respectively.

彭浩南教授带队参加大学生创新大赛陕西赛区训练营

Peng Haonan leads SNNU team in training camp of University Innovation Competition

2024 年 6 月 29 日，新概念传感器与分子材料研究院彭浩南教授带队参加了中国国际大学生创新大赛 (2024) 陕西赛区本科高校训练营。

On June 29, 2024, Prof. Peng Haonan of the Institute of New Concept Sensors and Molecular Materials led the Shaanxi Normal University contestants to participate in the undergraduate training camp of Shaanxi Region of the China International University Innovation Competition (2024).

Issue 13, 2024

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From the journal:
Chemical Society Reviews

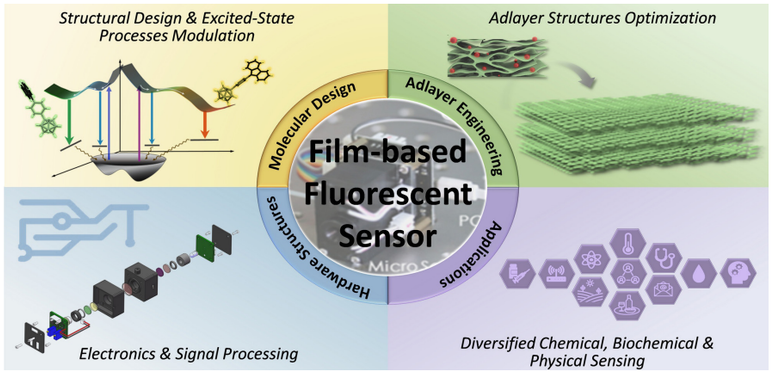
Molecular design and architectonics towards film-based fluorescent sensing

Check for updates

Rongrong Huang, [ab] Taihong Liu, [a] Haonan Peng, [a] Jing Liu, [a] Xiaogang Liu, [*b] Liping Ding [*a] and Yu Fang [*a]

Chem. Soc. Rev. 综述：薄膜荧光传感中的分子设计与材料构筑

Rongrong Huang, Taihong Liu, Haonan Peng, Jing Liu, Xiaogang Liu*, Ding Liping* and Fang Yu*. Chem. Soc. Rev., 2024, DOI: 10.1039/d4cs00347k



近日，陕西师范大学新概念传感器与分子材料研究院房喻院士团队在 Chemical Society Reviews 上发表了薄膜荧光传感的分子设计与材料构筑相关综述文章，黄蓉蓉博士为第一作者，房喻教授、丁立平教授及新加坡科技设计大学刘晓刚教授为通讯作者。

背景介绍

随着智能化社会的到来，传感器作为连接现实世界与虚拟信号的主要媒介，已渗透于人类生产生活的各个方面，包括工农业生产、国防安全、医疗健康和环境监测等。也正因如此，传感器已被纳入十四五规划和 2035 年远景目标纲要之中。

作为光学传感技术领域的分支之一，荧光传感技术在对各种化学物质、生物物种和物理量进行检测或测量中发挥着不可或缺的作用。相对于均相（溶液）传感器，薄膜传感器具有不污染待测体系、可重复使用、易于器件化等优点，因而备受青睐。

作为入选 2022 年度 IUPAC 化学十大新兴技术之一，薄膜荧光传感器（Film-based Fluorescent Sensors, FFSs）以其卓越的探测性能、高度的功能可设计性、优异的可集成性，以及低功耗和易于小型化等特点成为国际公认的新一代最具发展潜力的微痕量物质探测技术。在过去的二十多年里，高性能薄膜荧光传感器在爆炸物、毒品、化学战剂、挥发性有机化合物，乃至温度、紫外光、湿度等的检测或测量方面取得了显著进展。部分薄膜荧光传感器已从实验室研究迈向了实际应用阶段，展示了其在经济社会发展中的重要价值。

此外，出版物数量的增加也突显了薄膜荧光传感器在传感技术领域中的影响日益增长。许多工作致力于荧光敏感材料的创制和传感设备的开发，已取得了显著的进展，推动了 FFS 的

发展。

然而，到目前为止，能成功进入了市场并投入实际应用的传感器并不是很多，主要包括基于有机发光分子材料的毒品和爆炸物探测器，以及基于稀土发光材料的氧气和温度传感器。因此，加快传感器研究向实际应用转化的步伐仍然任重而道远。在实际使用中，传感器表现出的传感灵敏度、选择性、响应速度，以及传感器的重复使用性能都决定着一种新发展的传感器能否获得实际应用。要获得高性能薄膜荧光传感器，敏感薄膜材料的制备和性能提升是关键，而这些都离不开荧光单元的理性设计和薄膜材料的可控构筑。

综述概要

该综述系统回顾了过去二十多年来薄膜荧光传感领域的研究进展，重点介绍了荧光分子设计和活性层结构调控方面的代表性成果，详细介绍了几类常用的有机荧光小分子，以及与传感过程相关的激发态过程。同时，还深入探讨了六种不同的薄膜材料制备技术和策略，分析了各自的优缺点。此外，该综述还讨论了薄膜光稳定性和基质效应对薄膜荧光传感器传感性能的影响。最后，作者进一步展望了这一新兴领域未来发展面临的机遇和挑战。

第一作者：新加坡科技设计大学博士后黄蓉蓉
通讯作者：新加坡科技设计大学刘晓刚教授，陕西师范大学丁立平教授、房喻教授
全文链接：https://pubs.rsc.org/en/content/articlelanding/2024/cs/d4cs00347k

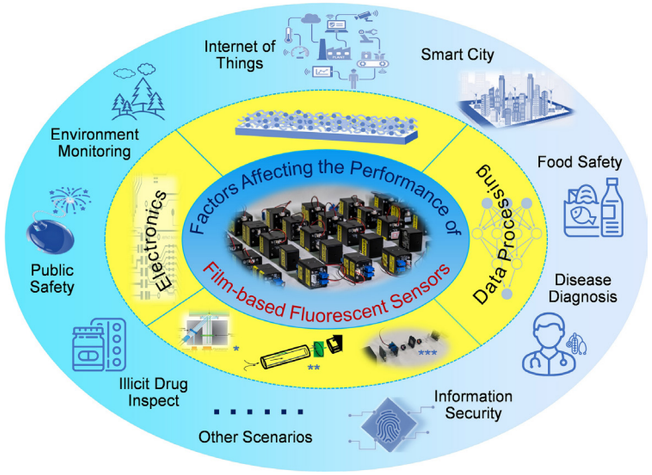


图 1. 影响薄膜荧光传感器传感性能的关键因素（薄膜材料、硬件结构、电子学、数据采集与处理等）。注：* 商业仪器的光学系统结构；** 由 Swager 等人发明的器件结构；*** 由 Fang 等人发明的器件结构。

Figure 1. Key factors (sensing film, hardware structure, electronics, data collection, processing, etc.) affecting the sensing performance of filmbased fluorescence sensors and their potential applications. Notes: * an optical system structure of a commercial instrument; ** the device structure invented by Swager et al.; *** the device structure invented byFang et al.

Recently, the academic team led by Academician Fang Yu from Shaanxi Normal University published a comprehensive review article on the molecular design and materials construction of film-based fluorescent sensors in Chemical Society Reviews. Dr. Huang Rongrong is the first author, and the corresponding authors are Professor Fang Yu, Professor Ding Liping, and Professor Liu Xiaogang from the Singapore University of Science and Technology.

Background

Chemical Society Reviews is a top journal published by the Royal Society of Chemistry in the United Kingdom, featuring high-impact, authoritative, and readable review papers. Starting from its predecessor Quarterly Review of the Chemical Society established in 1947, Chemical Society Reviews has published many influential review papers over the past 70 years, growing to become one of the most influential and recognized journals in the field of chemical science, consistently ranking at the forefront of various impact metrics among all scientific journals.

With the rise of the intelligent society, sensors have become the primary link between the physical world and virtual signals, pervading numerous facets of human production and daily life, including industrial and agricultural operations, national defence and security, medical and healthcare realms, and environmental monitoring. This pivotal role has led to the inclusion of sensors in the 14th Five-Year Plan and the 2035 Vision Outline. As a subset of optical sensing technology, fluorescent sensing technology occupies a crucial position in the detection and measurement of diverse chemical substances, biological species, and physical parameters. In comparison to homogeneous (solution-probe) sensors, film sensors offer distinct advantages, such as non-interference with the system being tested, reusability, and ease of implementation, making them highly sought after.

Film-based fluorescent sensors (FFSs) have been identified by IUPAC as one of the top ten emerging technologies in chemistry for 2022. FFSs are internationally recognized as a cutting-edge micro-trace substance detection technology, offering exceptional detection performance, versatile design options, excellent integration capabilities, low power requirements, and the ability to be miniaturized easily. Over the past two decades, high-performance FFSs have made significant strides in detecting explosives, drugs, chemical warfare agents, volatile organic compounds, temperature, ultraviolet light, humidity, and more. Several FFSs have successfully transitioned from lab experiments to practical applications, showcasing their significant value in driving economic and social development.

The rising number of publications underscores the growing influence of FFSs in the realm of sensing technology. Extensive efforts have been directed towards the development of sensitive materials and advanced sensing devices, leading to significant breakthroughs that propel the advancement of FFSs. Nevertheless, only a handful of sensors, primarily comprising drug and explosive detectors leveraging organic luminescent materials, along with oxygen and temperature sensors using rare earth luminescent materials, have managed to penetrate the market and find practical utility. Consequently, expediting the transformation of sensor research into real-world applications remains a formidable challenge.

When it comes to practical usage, the sensing sensitivity, selectivity, response speed, and reusability are pivotal factors in determining the feasibility of a film-based fluorescent sensor for practical deployment. To achieve high-performance fluorescent sensing, critical focus must be placed on the preparation and enhancement of sensitive film materials, which hinge on the rational design of fluorescent units and the precise construction of film materials.

Summary

Herein, Prof. Fang Yu, Prof. Ding Liping, in collaboration with Prof. Liu Xiaogang from the Singapore University of Technology and Design, have jointly authored a comprehensive review article, systematically reviewing the research progress in the field of FFSs over the past twenty years. The review focuses on introducing representative achievements in the design of fluorescent molecules and active layer structures engineering. This review elaborates on several commonly used organic fluorescent small molecules and the excited state processes relevant to sensing processes. Additionally, it delves into six different film material preparation techniques and strategies, analysing their respective advantages and disadvantages. Furthermore, the review discusses the impact of film photostability and substrate effects on the sensing performance of FFSs. Finally, the authors provide further insights into the opportunities and challenges in this emerging field.

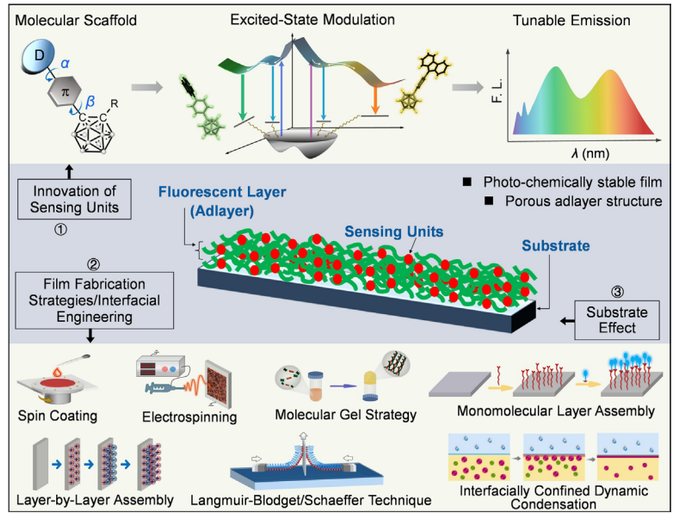


图 2. 敏感荧光薄膜创制的两个关键方面，即荧光单元创新与活性层结构调控。光稳定性和薄膜结构的多孔性是获得高性能敏感薄膜必要条件，基质效应也须引起重视。

Figure 2. Schematic illustration for the innovative development of filmbased fluorescent sensors from molecular design, fabrication strategy, and substrate effect, where the two pre-requirements for high-performance sensing are presented.

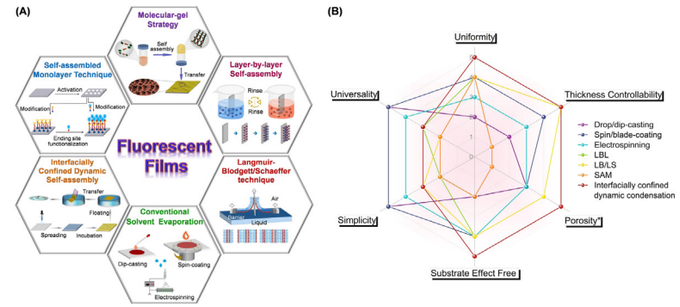


图 3. 不同薄膜制备技术和策略，以及从普适性、简易性、薄膜均一性、薄膜厚度可调性和多孔性等方面对不同制备技术的比较。

Figure 3. Different techniques or strategies to develop fluorescent sensing films, and comparison of different film fabrication strategies from the aspects of operation simplicity, cost efficiency, film uniformity, film thickness controllability, and porosity.

First Author: Huang Rongrong, postdoctoral researcher, Singapore University of Technology and Design
Correspondence Authors: Prof. Xiaogang Liu, Singapore University of Technology and Design, Prof. Ding Liping and Ding Liping, Shaanxi Normal University
Full Text Link: https://pubs.rsc.org/en/content/articlelanding/2024/cs/d4cs00347k

王树研究员、郑企雨研究员、陈缙泉教授和杨杰教授应邀作报告

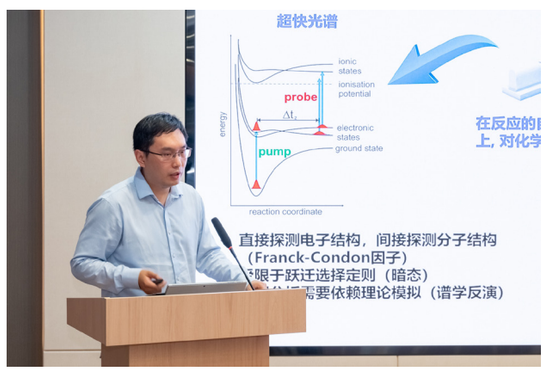
Prof. Wang Shu, Prof. Zheng Qiyu, Prof. Chen Jinquan and Prof. Yang Jie invited to give reports

2024 年 6 月 2 日下午，中国科学院化学研究所王树研究员、郑企雨研究员，华东师范大学陈缙泉教授，清华大学杨杰教授受邀访问新概念传感器与分子材料研究院，并分别作了题为“导电高分子光学探针与生物应用”“浅谈化学的前沿与创新”“表观遗传核酸分子的激发态动力学研究”和“利用 MeV 超快电子衍射拍摄分子电影”的学术报告。

报告会由副院长丁立平教授主持，研究院和化学化工学院部分教师及研究生参加了此次报告会，并与四位报告人进行了学术交流。

On June 2, 2024, Prof. Wang Shu and Prof. Zheng Qiyu from the Institute of Chemistry, Chinese Academy of Sciences, Prof. Chen Jinquan from East China Normal University and Prof. Yang Jie from Tsinghua University were invited to visit the Institute of New Concept Sensors and Molecular Materials and presented reports titled “Conductive polymer optical probe and its biological application”, “Brief introduction to the frontiers and innovations of chemistry”, “Study on the excited state dynamics of epigenetic nucleic acid molecules” and “Shooting molecular film using MeV ultrafast electron diffraction” respectively.

The reports was chaired by vice dean Prof. Ding Liping. Teachers and graduate students from the Institute and the School of Chemistry and Chemical Engineering attended the session and had academic exchanges with the four speakers.



西安交通大学张迈曾书记一行来访

Xi’an Jiaotong University former Party Secretary Zhang Maizeng received

2024 年 6 月 5 日，西安交通大学原党委书记张迈曾一行在陕西师范大学原党委书记程光旭陪同下到访新概念传感器与分子材料研究院，参观了综合展厅，并与房喻院士进行了座谈交流，并指导工作。

陕西师范大学科学技术处处长薛东教授、研究院副院长丁立平教授、办公室主任杨小刚、秘书左振男和专职科研人员罗艳彦参加了座谈交流。

On June 5, 2024, Zhang Maizeng, former Party Secretary of Xi’an Jiaotong University, accompanied by Cheng Guangxu, former Party Secretary of Shaanxi Normal University, visited the Institute of New Concept Sensors and Molecular Materials, and had a talk with Prof. Fang Yu, after touring its comprehensive exhibition room.

SNNU Science and Technology Department director Prof. Xue Dong, INCSMM vice dean Prof. Ding Liping, Administrative Office director Yang Xiaogang, secretary Zuo Zhennan and research assistant Luo Yanyan participated in the talk.

西安邮电大学商锋教授一行来访

Prof. Shang Feng of Xi'an University of Posts and Telecommunications received

2024 年 6 月 7 日，西安邮电大学商锋教授与西安汽车职业大学党委书记孙冰红一行到访新概念传感器与分子材料研究院，参观了综合展厅，并与房喻院士进行了座谈交流。

研究院彭浩南教授、刘太宏副教授、办公室主任杨小刚、秘书左振男和专职科研人员何怡楠参加了座谈交流。西安邮电大学张运启副教授、商语秋博士、周文佳博士等陪同来访。

On June 7, 2024, Prof. Shang Feng from Xi'an University of Posts and Telecommunications and Party Secretary of Xi'an Automotive Vocational University Sun Binghong visited the Institute of New Concept Sensors and Molecular Materials, and had a talk with Prof. Fang Yu, after touring its comprehensive exhibition room..

INCSMM Prof. Peng Haonan, A/Prof. Liu Taihong, Administrative Office director Yang Xiaogang, secretary Zuo Zhennan and research assistant He Yinan participated in the talk. XUPT A/Prof. Zhang Yunqi, Dr. Shang Yuqiu, Dr. Zhou Wenjia, etc. accompanied the visit.

法国国家科学研究中心和图卢兹大学 Lionel Salmon 教授应邀作报告

Prof. Lionel Salmon of CNRS & Université de Toulouse invited to give a report

2024 年 6 月 13 日，法国国家科学研究中心和图卢兹大学配位化学实验室 Lionel Salmon 教授应邀访问新概念传感器与分子材料研究院，并在报告厅作题为 Fabrication of Spin Crossover Nanocomposites and Devices for Electromechanical Applications 的学术报告。报告会由彭浩南教授主持，研究院部分教师及研究生参加。

在报告中，Lionel Salmon 教授介绍了自旋交叉纳米复合材料及器件的制备方法，对材料的选择和合成条件等方面进行了讲解，并解释了相关技术和应用领域。丁立平教授等四位老师和同学与 Lionel Salmon 教授进行了讨论和交流。

报告结束，Lionel Salmon 教授和到场教师合影留念。

On June 13, 2024, Prof. Lionel Salmon from Laboratoire de Chimie deCoordination, Centre National de la Recherche Scientifique (CNRS) and University of Toulouse (UT), France, was invited to visit the Institute of New Concepts Sensors and Molecular Materials and give a lecture titled "Fabrication of Spin Crossover Nanocomposites and Devices for Electromechanical Applications". The session was hosted by Prof. Peng Haonan and attended by faculty members and graduate students of the Institute.

Prof. Lionel Salmon introduced the preparation method of spin-crossover nanocomposites and devices, explained the selection of materials and synthesis conditions, as well as the related technology and application areas. Prof. Ding Liping and other three teachers and students asked questions and exchanged ideas with Prof. Salmon.

After the presentation, Prof. Lionel Salmon took a group photo with the teachers present.

陕西省科技厅白崇军副厅长一行来访座谈

Shaanxi Science and Technology Department deputy director Bai Chongjun received

2024 年 6 月 18 日下午，陕西省科学技术厅白崇军副厅长一行到访新概念传感器与分子材料研究院，参观了综合展厅，并与房喻院士进行了座谈交流。

在座谈中，房喻院士强调了国际开放和交流的重要性，指出要解放思想，利用好资源。白崇军副厅长表示要加强对接沟通，做好国际合作与交流服务。

陕西师范大学科学技术处处长、化学化工学院院长薛东、国际交流与合作处处长张凌云、科学技术处副处长曹晓仪、食品工程与营养科学学院张华峰教授、研究院彭浩南教授、刘太宏副教授、对外联络与行政办公室主任杨小刚和秘书左振男参加了座谈交流。陕西省科技厅二级巡视员张文华、对外合作与交流处副处长刘磊、人才处（外国专家服务处）副处长王莉、对外合作与交流处四级调研员赵一君等陪同来访。

On June 18, 2024, Bai Chongjun, deputy director of Shaanxi Provincial Department of Science and Technology, visited the Institute of New Concept Sensors and Molecular Materials, and had a talk with Prof. Fang Yu, after touring its comprehensive exhibition room.

In the meeting, Fang Yu stressed the importance of open-up and international exchange, advocating for emancipating minds and making good use of resources. Bai Chongjun vowed to strengthen docking and communication and do a good job in international cooperation and exchange services.

SNNU Science and Technology Department director and School of Chemistry and Chemical Engineering dean Xue Dong, Department of International Exchange and Cooperation director Zhang Lingyun, Science and Technology Department deputy director Cao Xiaoyi, Prof. Zhang Huafeng of the School of Food Engineering and Nutrition Science, INCSMM Prof. Peng Haonan, A/Prof. Liu Taihong, Office of External Liaison and Administration director Yang Xiaogang and secretary Zuo Zhenan participated in the meeting.

Zhang Wenhua, second-level inspector of Shaanxi Provincial Department of Science and Technology, Liu Lei, deputy director of the International Cooperation and Exchange Office, Wang Li, deputy director of the Talent Office (Foreign Expert Service Office), Zhao Yijun, fourth-level investigator of the International Cooperation and Exchange Office, accompanied the visit.

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