**AppendixD-3: Samples of research results, national and provincial-level scientific research projects, and awards for scientific and technological achievements**

| Serial number | Name | Undertaken R&D projects | Representative achievements | Scientific and technological achievements award |
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| 1 | Zhang Wei | 1. Hosted the 2020 National Natural Science Foundation general project: Modified shell powder/Ce-N-$TiO_2$Research on the mechanism of adsorption and photocatalytic degradation of typical dissolved organic phosphorus (42071122)<br>2. Presiding over the 2023 National Natural Science Foundation General Project: LDH/MIL-101(Fe)/La-Fe-$TiO_2$Research on Molecular Design Synthesis and Its Removal Mechanism for Typical Nitrogen-Containing Heterocyclic Compounds (52370074) | In 2022, selected as one of the first high-level talents in Yiyang City.<br>Director of the Hunan Provincial Village and Town Drinking Water Quality Safety Assurance Engineering Technology Research Center, Hunan Provincial Department of Science and Technology, 2019;<br>3. Photocatalytic degradation of glyphosate using Ce/N codoped TiO2 with oyster shell powder as carrier under the simulated fluorescent lamp, FRONTIERS IN ENVIRONMENTAL SCIENCE, 2023, SCI3 district, ranked 1st<br>4. Elimination of micropollutants by the solar/chlorine process: contribution of reactive species and formation risk of NDMA Environmental Science, Water Research & Technology, 2022, SCI Zone 3, ranked 1st | 1. Hosted the third prize of Hunan Provincial Science and Technology Progress Award---Research on the adsorption and photodegradation of chlorobenzene using multi-walled carbon nanotubes loaded with $TiO_2$Application Technology (2016) |
| 2 | Zhang Chun | 1. Hosted the 2021 Hunan Provincial Natural Science Foundation Project: Migration and Transformation of Heavy Metals in Arsenic-Alkali Slag from Abandoned Areas of Typical Jin Mining District, Source Control and Mechanism (2021JJ30080）<br>2. Hosted the 2017 Hunan Provincial Natural Science Foundation project: Magnetic Nanocore-Shell $Fe_3O_4$Composite Materials for the Reaction Mechanism of Removing Heavy Metal Antimony from Acidic Wastewater<br>3. 2016 Hunan Provincial Department of Education Excellent Youth Project: Research on the Mechanism and Kinetics of Sulfur Dioxide Reduction and Decomposition of Zinc Cadmium Ferrite (16B049) | 1. Environmental Activity and Ecological Assessment of Heavy Metals in the Reductive Leaching Residue from Zinc Hydrometallurgy Industry《Transactions of the Indian Institute of Metals》, 73(7):1755-1761, 2020.05, SCI source journal, Chinese Academy of Sciences 4th district, ranked 1st;<br>2. Adsorption performance of antimony by modified iron powder, 《RSC Advances》, 9(54): 31645-31653, 2019.09, SCI source journal, Chinese Academy of Sciences 3rd district, ranked 1st;<br>3. Magnetic seeds assisted iron recovery from t he reductive leaching solution in hydrometallur gical process. Transactions of the Indian<br>Institute of Metals, 72(10):2591-2597, 2019.05, SCI source journal, Chinese Academy of Sciences 4th district, ranked 1st; | First Prize of the 3rd Excellent Academic Achievement Award in Natural Sciences of Yiyang City, 2019 |
| 3 | Wang Aihe | 1. Host a key project of the Hunan Provincial Department of Education: Research on the optimization preparation of magnetic ternary metal composite oxide particle adsorbents and efficient deep defluorination mechanisms. | 1. Adsorption of fluoride by the calcium alginate embedded with Mg-Al-Ce trimetal oxides. KOREAN JOURNAL<br>OF CHEMICAL ENGINEERING SCI (Chinese Academy of Sciences Area 3) 2018.<br>2. Hosted the Hunan Province Ordinary Water Supply and Drainage Science and Engineering Professional School-Enterprise Cooperation Innovation and Entrepreneurship Education Base, 2019.<br>3. Host a first-class offline course in Hunan Province - Architectural Water Supply and Drainage Engineering. | Third Prize of Hunan Province Science and Technology Progress Award, 2016, ranked third |
| 4 | Chi Nianping | Research on the mechanism of removing dissolved organic nitrogen using magnetic | 1. FeS redox power motor for PDS continuous generation of active radicals on efficient degradation | — |

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| | | diatomaceous earth-ceramic membrane bioreactor, Hunan Provincial Natural Science Foundation. (NO: 2022JJ50263) | and removal of diclofenac: Role of ultrasonic. Chemosphere, Chinese Academy of Sciences Zone 2<br>2. Efficient removal of RR2 dye by electro-Ce(III) process with its<br>elegant arts and attractive charm in performance, energy consumption and mechanism. Environmental Research, Chinese Academy of Sciences Zone 2.<br>3. Pre-treatment + catalytic internal electrolysis + ceramic membrane A/O-MBR treatment of coking wastewater, China Water Supply and Drainage.<br>4. Preparation of amphiphilic cationic polyacrylamide (CPAM) with cationic microblock structure to enhance printing and dyeing sludge dewatering and conditioning performance. Environmental Science and Pollution Research. Chinese Academy of Sciences Zone 3. | |
| 5 | Zhu Xilin | — | 1. National Survey and Design Registered Public Equipment Engineer Water Supply and Drainage Professional Qualification Examination Textbook−Volume 3 Building Water Supply and Drainage Engineering, compiling the chapter on building fire protection.<br>2. Green Industrial Building Evaluation Standard (GB/T 50878−2013), is one of the main drafters of the standard. | The East China Manufacturing Base Construction Project of Dongfang Electric Wind Power (New Energy) won the second prize of the Excellent Engineering Consulting Survey and Design Award in the machinery industry.<br>2. The Zhonglian Heavy Industry Quentang Industrial Park project won the first prize for Excellent Engineering Consulting Achievements in Hunan Province and the second prize for Excellent Engineering Design in Hunan Province.<br>3. The construction project of Xinxing Muye Park won the third prize of the Excellent Engineering Consulting Survey and Design Award in the machinery industry. |
| 6 | Wang Lixin | — | 1. Calcium carbonate chemical sludge dewatering discharge device, utility model patent, patent number: CN201520768412.X | Zhaofeng Ceramics (Chongqing Zhaoci) Co., Ltd. technical transformation project, person in charge of water supply and drainage. |

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| | | | | Won the National Eighth Excellent Engineering Design Gold Award and the First Prize for Excellent Engineering Design from the National Light Industry Bureau<br><br>Feicheng, Shandong Refined Salt Plant 2×600,000 tons/year Heat Pump Salt Production Technical Renovation Project Feasibility Study Report, Head of Water Supply and Drainage Specialty, won the First Prize of Engineering Consulting Achievements from Hunan Provincial Engineering Consulting Association.<br><br>2. Haier Pakistan Industrial Park (washing machine factory, refrigerator factory, air conditioner factory), head of the water supply and drainage specialty, awarded the third prize for excellent engineering design in the light industry sector. |
| 7 | Yan Hengzhen | Hosted the 2014 Hunan Province Higher Education Teaching Reform Research Project - Research on the Reform of the School-Enterprise Cooperation Talent Training Model for the Water Supply and Drainage Science and Engineering Major (Xiang Jiao Tong [2014] No. 247);<br><br>2. Hosted the 2013 Hunan Provincial Department of Education Scientific Research Youth Project - Evaluation of the Biodegradability of Typical Oxidized Mineral Flotation Reagents (No.: 13B009);<br><br>3. Hosted the 2013 Hunan City University higher education scientific research project - Construction of an applied innovation faculty team based on the Excellent | 1. Yan Hengzhen, Chen Shaohua. Study on the Biodegradability of Hydrocarbon Yellow Agents and Their Structural Correlation [J]. Journal of Safety and Environment, 2015, 16(6): 242-245. (CSCD)<br><br>2. Yan Hengzhen, Gong Wenqi, Mei Guangjun, et al. Study on the aerobic biodegradation performance of amine collectors [J]. Journal of Safety and Environment, 2011, 11(4): 76-81. (CSCD) | Second Prize of the 2nd Excellent Academic Achievement Award in Natural Sciences of Yiyang City, 2016 |

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| | | Engineer Training Program (No.: JK13A007, departmental level) | | |
| 8 | Deng Jie | 1. Invention patent, invention name: A composite catalyst for treating wastewater and its preparation method, patent number ZL202210107796.5, authorization announcement date September 8, 2023;<br>2. Host the 2020 Ministry of Education Higher Education Department Collaborative Education Project: Research on the Teaching Reform of the Water Supply and Drainage Engineering Course under the Background of Engineering Education Accreditation (201902099001);<br>3. Hosted the 2008 Hunan Provincial Department of Education Excellent Youth Project: Experimental Research on Hydraulic Cavitation of Porous Plates and Its Enhancement Effects (08C201);<br>4. Hosted the 2008 Hunan Provincial Department of Education general project: Experimental study on hydraulic cavitation of porous plates and its enhancement effect (08C201) | 1.Experimental Study of the Porous Plate Hydrodynamic Cavitation Device and Removal of Algae in Water[J].Recent Development on Material Science and Environmental Material,2013,7:569-572(EI indexed).<br>2. Experimental Investigation on Enhancive Effect of Hydrodynamic Cavitation [J]. Advances in Chemical Engineering III, 2013, 7:2865-2869 (EI indexed).<br>3. Study on Absorption Experiment of Methylene Blue by Nitrifying Peat [J]. Sustainable Cities Development and Environment, 2012, 8: 1969-1972 (EI Record).<br>4. Study of Porous plate hydrodynamic cavitation device for P-Nitrophenol[J]. Chemical Engineering and Material Properties III, 2012.8 (EI indexed). | — |
| 9 | Li Yuanping | 1. Hosted the 2020 Hunan Province Natural Science Youth Fund Project: Research on the Mechanism of Microbial Remediation of Polybrominated Diphenyl Ether Contaminated Sediment Based on Biochar Enhancement (2020JJ5019)<br>2. Hosted the 2017 Hunan Provincial Department of Education general project on scientific research: Research on simultaneous sensing and detection of heavy metals Cd and Pb in water environment based on 3D gold nanocluster modified gold electrodes (17C0305)<br>3. Hosted the 2021 Hunan Provincial Department of Education Excellent Young Research Project: Research on the Electron Transfer Mechanism of Humic Acid-Mediated Reduction and Remediation of Valence Heavy Metal Pollution (21B0715)<br>4. Hosted the 2022 Hunan Province Higher Education Teaching Reform Research Project: Research on the Teaching Reform of "Hydraulics" as a "Golden Course" under the Background of First-Class Major Construction and Engineering Education Professional Certification (HNJG-2022-0995) | 1.Effects of physicochemical parameters on Actinomycetes communities during composting of agricultural waste. Sustainability, 2019, 11(8): 2229-2242 (SCI Zone 3, SSCI dual-indexed, first author)<br>2. Modification of sludge biochar by MnO2 to degrade methylene blue: Synergistic catalysis and degradation mechanisms. Journal of Water Process Engineering. 2022, 48:102864.<br>(SCI Zone 2, first author)<br>3. Research on the Application of Gene Sensing and Immunological Techniques in the Detection of Environmental Pollution Control Processes [M]. Changsha: Central South University Press, 2022. ISBN 978-7-5487-5113-7 (Academic Monograph, First Author) | Third Prize of the 3rd Excellent Academic Achievement Award in Natural Sciences of Yiyang City, 2019 |
| 10 | Sheng Jianwu | Research on multi-parameter detection of water quality based on deep analysis of UV-visible absorption spectra, Hunan Provincial Natural Science Foundation. (NO.2023JJ50346) | 1. Jian-wu Sheng, Miao He, Han-chang Shi, Yi Qian. A comprehensive ELISA for the detection of microcystins in waters based on polyclonal antibodies, Analytica Chimica Acta. 2006, 572(2): 309~315.<br>2.Sheng J W, He M, Shi H C. A highly specific i mmunoassay for microcystinLR detection based on a monoclonal antibody. Anal Chim Acta. 200 7, 603(1): 111-118. | First Prize of the Ministry of Education Technology Invention Award, 2014, ranked 5th; Third Prize of the Zhejiang Province Science and Technology Progress Award, 2023, ranked 4th |

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| 11 | Chen Wen | 1. Hosted and concluded the Hunan Provincial Department of Education project "Research on the Treatment of Pathogenic Microorganisms in Air Conditioning Cooling Water" Xiangcai Education Instruction [2008] No. 71<br>2. Hosted and concluded the Hunan Province Construction Science and Technology Plan project "Research on the Treatment of Pathogenic Microorganisms in Recirculating Cooling Water" (Xiangjian Science [2008] No. 459) | Detection and prevention of pathogens in solar water heaters at medium and low temperatures [J]. "Research on Urban Construction Theory", 2011.6, first author. | — |
| 12 | Wen Zhifang | — | Urban black and odorous water body 治理 - Xia Qionghu (Jingxing Temple area) interception and ecological shoreline restoration project general contracting (EPC) design project; Yiyang Zishan Lake Square quality improvement and renovation project design project, won the 2020 Hunan Province Sponge City Construction Excellent Design Award; Yuan | The "Tianyi Wood Country Project" won the first prize for excellent engineering survey and design in Hunan Province in 2018.<br>The "Nanyue Ancient Town Scenic Area Quality Improvement and Renovation Project" won the third prize for excellent engineering survey and design in Hunan Province in 2020. |
| 13 | Zhou Jun | 1. Hosted the Hunan Provincial Department of Science and Technology's Natural Science Foundation Joint Fund Project: "Research on the Operating Conditions and Membrane Characteristics of Two-Phase Distribution Biofilter Towers for Treating Methyl Mercaptan (2022JJ50284)." | Zhou Jun, Guo Qianying, Yang Ying, Liu Baisheng, Liu Fan, Zheng Youchen. Comparison of three-dimensional electrolytic fixed bed treatment of catering wastewater with different anode plates [J]. China Water Supply and Drainage, 2020, 36(23): 58-63. (CSCD core journal). | Yiyang City Fifth Natural Science Excellent Academic Achievement Award Excellent Award, 202312 |
| 14 | Wang An | 1. Hosted the joint project of Hunan Provincial Department of Science and Technology: "Research on the Recovery of Metallic Arsenic from Waste Acid by Iodine-Copper Synergistic Reduction Method" (2023JJ50347);<br>2. Host of the Hunan Provincial Department of Education general project: "Basic Research on the Reduction and Recovery of Metallic Arsenic in High Sulfuric Acid Medium by Chlorocopper Synergy" (23C0331) | 1.*An Wang*, Kanggen Zhou*, Xuekai Zhang, Dingcan Zhou, Changhong Peng, Wei Chen*. Arsenic removal from highly acidic wastewater with high arsenic content by copper chloride synergistic reduction. Chemosphere, 238, 124675, 2020 (Chinese Academy of Sciences Zone 2, JCR Q1)<br>2.*An Wang*, Kanggen Zhou*, Xuekai Zhang, Dingcan Zhou, Changhong Peng, Wei Chen*. Reductive removal of arsenic from waste acid containing high acidity and arsenic levels through iodide and copper powder synergy. Chemical Engineering Journal, 373, 23-30, 2019 (Chinese Academy of Sciences Zone 1, JCR Q1)<br>3. Kanggen Zhou, *An Wang*, Duchao Zhang*, Xinwang Zhang, Tianzu Yang. Sulfuric acid leaching of Sm-Co alloy waste and separation of samarium from cobalt, Hydrometallurgy, 174, 66-70, 2017 (Chinese Academy of Sciences Zone 2, JCR Q1) | — |
| 15 | Wang Yang | 1. Hosted the joint project of Hunan Provincial Department of Science and Technology: "Research on the Formation Mechanism of Mercury | 1. Liu Yimin; Wang Yang; Wang Ji; Cai Xiongfeng; Zheng Jiawei; Analysis of | First Prize in Science and |

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| | | Pollution in Groundwater of Solid Waste Landfills in the Dongting Lake Area and Health Risk Assessment" (2022JJ50274);<br>2. Hosted a general project of the Hunan Provincial Department of Education: "Source and Migration Transformation Mechanism of Plant Mercury in the Yuanjiang Section of the Dongting Lake Area" (22C0509)<br>3. Host the application basic research and soft science research plan of the Yiyang City Science and Technology Bureau "Suitability Analysis and Treatment Technology of Solid Waste Landfill Sites in the Hidden Karst Areas of the Dongting Lake Region [2022] No. 108" | groundwater pollution characteristics and health risk assessment of valley-type landfills, Environmental Chemistry, 2022, 41(8): 2540-2550 | Technology of the Nonferrous Metals Industry of China, 2016 |
| 16 | Wang Caiwen | 1. Host the 2020 Ministry of Education Industry-University Cooperation Collaborative Education Project: Research on the Industry-University-Research Practice Teaching System from the Perspective of Excellent Engineers.<br>2. Hosted the 2020 Hunan Provincial Department of Education general project: Characteristics of the co-precipitation treatment process of antimony-containing wastewater and the mechanism of antimony form regulation (Xiangjiao Tong [2020] No. 264, Project No. 20C0343), 2020-2023<br>3. Hosted a general research project of the Hunan Provincial Department of Education: Research on the photocatalytic degradation of typical persistent organic pollutants using electric field-controlled carbon nanofibers) Hunan Education Communication (2023) No. 361, Project Number 23c032) | Water Pump and Pump Station, Associate Editor, Peking University Press, 2014 | Study on the adsorption and photocatalytic degradation of chlorobenzene using multi-walled carbon nanotubes loaded with $TiO_2$, Third Prize of Hunan Provincial Science and Technology Progress Award (Ranked Fourth), December 2016 |
| 17 | Jiang Haiyan | 1. Hosted by the Hunan Provincial Department of Education general project: "Preparation of Sodium Alginate/Graphene Oxide Composite Membrane and Its Study on Cu(II) Adsorption Performance" (16C0303); | 1. Activation of calcined kaolin with persulfate for the removal of tetracycline from wastewater [J]. Journal of Environmental Engineering, 2020, 14(9): 2494-2505.<br>2. New insight into highly efficient removal of tetracycline by calcined hydroxyapatite activated peroxymonosulfate: The role of calcium carbonate and phosphate group[J]. Journal of Water Process Engineering, 2023, 55: 104207. (SCI Chinese Academy of Sciences Zone 2, JCR Q1, first author) | — |
| 18 | Deng Yumei | 1. Hosted the 2018 Hunan Provincial Department of Education general project: "The Effect of CTAB/Ultrasonic Combined Treatment on the Dewatering Performance of Activated Sludge" (18C0840);<br>2. Hosted the Hunan City University Science and Technology Project "The Impact of Microwave Conditioning on Sludge Dewatering Performance" (2016xj14)<br>3. Hosted the 2023 Hunan Province Education Science "14th Five-Year Plan" project: "Research on the Construction of Evaluation Index System for High-Quality Applied Talent Cultivation under the Background of Professional Certification" (ND232520) | The effect of frozen conditioning on the dewatering performance of activated sludge[J]. Journal of Environmental Engineering, 2017, 11(7): 4362-4366<br>2. Sponge City and Water Environment Planning and Construction in Jibu District in Changde City[J]. Sustainability, 2022, 15:444 (SCI Chinese Academy of Sciences Zone 3, first author) | Third Prize of the 3rd Excellent Academic Achievement Award in Natural Sciences of Yiyang City, 2019 |
| 19 | Lu Sen | 1. Hosted the 2020 Hunan City University open topic project: Research on rural drinking water safety issues and early warning mechanisms.<br>2. Presided over the 2021 Hunan Provincial Department of Education general project: | 1. Lu Sen. Analysis of Factors Influencing Graduate Employment Competence [J]. Quality Management, 2017, 10(7): 199-200.<br>2. Xiong Zhengwei, Lu Sen, Yang Bohao, Wang Zhiyong, Guo Qingwei. Study on the effect of filling | — |

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| | | Study on the preparation of amine oxime modified silica and its effectiveness in treating uranium (VI) wastewater (21C0670) | rate on the suspended chain aeration contact oxidation process [J]. Environmental Science and Technology, 2014, 37(5): 164-168. (CSCD)<br>2. Xiong Zhengwei, Lu Sen, Wang Zhiyong, Guo Qingwei, Yang Bohao, Sun Ping. Biological contact oxidation process of suspended chain for treating river sewage [J]. Environmental Engineering Journal, 2014, 8(7): 2748-2752. (CSCD)<br>Lu Sen, Yin Yuqiang, Shu Jinkai. Preparation of functionalized ethylamine oxime SiO2 and its adsorption study on U(VI) [J]. Natural Science, 2023, 5(9): 1-3.<br>4. Lu Sen, Shu Jinkai. "Exploration of Teaching Reform in 'Water Supply and Drainage Instruments and Control' under the Background of 'New Engineering + Professional Certification' [J]. China Education Workers, 2023, 9(72): 127. | |
| 20 | Li Hao | 1. Hosted the 2019 Hunan Provincial Department of Education general project: Ultrasonic-template polymerization of cationic polyacrylamide (TPAD) and its application in sludge conditioning research (19C0376) | Li Hao, Xie Min, Wang Aihe, Jiang Haiyan. The effect of ultrasound combined with CPAM on sludge structure and its dewatering performance [J]. Popular Standardization, 2020(22):182-183.<br>Li Hao, Wang Aihe. Study on the Adsorption Performance of Modified Tea Residue/Kaolin Composite Materials for Ammonia Nitrogen in Water [J]. Journal of Hunan City University (Natural Science), 2017, 26(06): 76-78. | — |
| 21 | Shu Jinkai | 1.Host2020Hunan Provincial Department of Education General Project: Study on the Efficiency of Hydrodynamic Cavitation andMWCNTs/ $TiO_2$Photocatalytic Combined Treatment of Wastewater Containing Pyridine (20C0366) | 1. "Influencing Factors and Kinetics of Modified Shell Powder/La-Fe-$TiO_2$ Photocatalytic Degradation of Pyridine Wastewater." International journal of environmental research and public health vol. 19,22 14835. 11 Nov. 2022, （SCI3区） | Yiyang City's Fifth Natural Science Excellent Academic Achievement Award, Excellence Award, 2023 |
| 22 | Deng Zhenning | 1.HostGeneral Project of Scientific Research of Hunan Provincial Department of Education in 2024:Research on the Construction of High Stability and Low-Cost Solid Adsorbents for Carbon Dioxide Capture and Efficient Capture Mechanisms (24C0467) | [1]. Zhenning Deng, Yi Liu, Mingwei Wan, Shengya Ge, Zhiwei Zhao, Jingwen Chen, Shixia Chen, Shuguang Deng, Jun Wang. Breaking trade-off effect of Xe/Kr separation on microporous and heteroatoms-rich carbon adsorbents. Separation and Purification Technology, 2023, 308, 122942-122948. (JCR SCI Zone 1 TOP Journal)<br>[2] Zhenning Deng, Longsheng Yang, Hanting Xiong, Junhui Liu, Xing Liu, Zhenyu Zhou, Jingwen Chen, Shixia Chen, Shuguang Deng, Banglin Chen, Jun Wang. Green and Scalable Preparation of an Isomeric CALF-20 Adsorbent with Tailored Pore Size for Molecular Sieving of Propylene from Propane. Small Methods, 2024, 2400838. (JCR SCI一区期刊） | — |