



Appendix 3-6: Selected samples of research results, national, provincial and ministerial scientific research projects, and awards for scientific and technological achievements

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serial number	name	R&D projects undertaken	Representative achievements	Scientific and technological achievements won awards
1	Zhang wei	<p>1. Presided over the 2020 National Natural Science Foundation of China: Study on the mechanism of action of modified shell powder/Ce-N-TiO₂ adsorption and photocatalytic degradation of typical dissolved organophosphorus (42071122)</p> <p>2. Presided over the 2023 National Natural Science Foundation of China: Design and Synthesis of LDH/MIL-101(Fe)/La-Fe-TiO₂ Molecules and Their Removal Mechanism of Typical Nitrogen-containing Heterocyclic Compounds (52370074)</p>	<p>1. In 2022, he was selected as the first batch of high-level talents in Yiyang City;</p> <p>2. Director of Hunan Provincial Engineering Technology Research Center for Drinking Water Quality Safety in Villages and Towns, Hunan Provincial Department of Science and Technology, 2019;</p> <p>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 area, Ranked No. 1</p> <p>4. Elimination of micropollutants by the solar/chlorine process: contribution of reactive species and formation risk of NDMA Environmental Science , Water Research & Technology , 2022, SCI3 district, ranked 1st</p>	<p>1. Presided over the third prize of Hunan Science and Technology Progress Award---Research and application technology of multi-walled carbon nanotube-supported TiO₂ adsorption and photodegradation of chlorobenzene (2016)</p>



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2	ZHANG Chun	<p>1. Presided over the 2021 Hunan Provincial Natural Science Foundation Project: Migration and transformation, source control and mechanism of heavy metals in arsenic alkali slag in typical Jin mining area (2021JJ30080).</p> <p>2. Presided over the 2017 Hunan Provincial Natural Science Foundation Project: Reaction Mechanism of Magnetic Nanocore-Shell Fe₃O₄ Composites for the Removal of Heavy Metal Antimony in Acidic Wastewater</p> <p>3. 2016 Outstanding Youth Project of Hunan Provincial Department of Education: Mechanism and Kinetics of Sulfur Dioxide Reduction and Decomposition of Zinc Cadmium Ferrite(16B049)</p>	<p>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, District 4, Chinese Academy of Sciences, ranked 1st;</p> <p>2. Adsorption performance of antimony by modified iron powder, RSC Advances, 9(54): 31645-31653, 2019.09, SCI source journal, Chinese Academy of Sciences Zone 3, ranked 1;</p> <p>3. Magnetic seeds assisted iron recovery from the reductive leaching solution in hydrometallurgical process. Transactions of the Indian Institute of Metals, 72(10):2591-2597, 2019.05, SCI, 4 districts, Chinese Academy of Sciences, ranked 1;</p>	First Prize of the 3rd Natural Science Outstanding Academic Achievement Award of Yiyang City, 2019
3	Wang Aihe	<p>1. Presided over the key project of Hunan Provincial Department of Education: Optimal preparation of magnetic ternary metal composite oxide particle adsorbents and research on the mechanism of efficient deep fluoride removal</p>	<p>1. Adsorption of fluoride by the calcium alginate embedded with Mg-Al-Ce trimetal oxides. KOREAN JOURNAL OF CHEMICAL ENGINEERING SCI (3rd DISTRICT, CAS), 2018.</p> <p>2. Presided over the Hunan Provincial General Water Supply and Drainage Science and Engineering School-Enterprise Cooperation Innovation and Entrepreneurship Education Base, 2019.</p> <p>3. Presided over the first-class offline course in Hunan</p>	1. Third Prize of Hunan Science and Technology Progress Award, 2016, ranked third



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			Province - Building Water Supply and Drainage Engineering.	
4	Chi Nianping	Mechanism of Magnetic Diatomaceous Earth-Ceramic Membrane Bioreactor for Removal of Dissolved Organic Nitrogen, Natural Science Foundation of Hunan Province.(NO:2022JJ50263)	<p>1.FeS redox power motor for PDS continuous generation of active radicals on efficient degradation and removal of diclofenac: Role of ultrasonic. Chemosphere, CAS Zone 2</p> <p>2.Efficient removal of RR2 dye by electro-Ce(III) process with its elegant arts and attractive charm in performance, energy consumption and mechanism. Environmental Research, CAS 2.</p> <p>3. Pretreatment + catalytic internal electrolysis + ceramic membrane A/O-MBR treatment of coking wastewater, water supply and drainage in China.</p> <p>4.Preparation of amphiphilic cationic polyacrylamide (CPAM) with cationic microblock structure to enhance printing and dyeing sludge dewatering and condition performance. Environmental Science and Pollution Research. 中科院 3 区.</p>	—
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, Writing Building Fire Protection Chapter.	1. Dongfang Electric Wind Power (New Energy) East



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			2. Evaluation standard for green industrial buildings (GB/T 50878-2013), one of the main drafters of the standard.	China Manufacturing Base Construction Project won the second prize of Excellent Engineering Consulting, Survey and Design Award in Machinery Industry. 2. Zoomlion Quantang Industrial Park project won the first prize of Hunan Provincial Excellent Engineering Consulting Achievement Award and the second prize of



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				Hunan Provincial Excellent Engineering Design Award. 3. The construction project of Xinxiang Muye Park won the third prize of the Excellent Engineering Consulting, Survey and Design Award of the Machinery Industry.
6	Wang Lixin	1. —	1. Calcium carbonate chemical sludge dewatering and discharging device, utility model patent, patent number: CN201520768412.X	1. Zhaofeng Ceramics (Chongqing Zhaoceramic) Co., Ltd. technical transformation project, water supply and drainage professional leader



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				Won the 8th National Excellent Engineering Design Gold Award and the First Prize of Excellent Engineering Design of the State Light Industry Bureau 1. Shandong Feicheng Refined Salt Plant 2×60,000 tons/year heat pump salt production project feasibility study report this year, water supply and drainage professional leader, won the



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				<p>first prize of engineering consulting achievements of Hunan Engineering Consulting Association</p> <p>2. Haier Pakistan Industrial Park (washing machine factory, refrigerator factory, air conditioner factory), head of water supply and drainage major, won the third prize of excellent engineering design in light industry industry</p>
7	Yan Hengzhen	1. Presided over the 2014 Hunan Provincial Teaching Reform Research Project of Ordinary Colleges and Universities - Research on the Reform	1. Yan Hengzhen, Chen Shaohua. Study on biodegradation performance and structural correlation of	Second Prize of the 2nd Natural Science Outstanding



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		<p>of the Talent Training Model of School-Enterprise Cooperation in Water Supply and Drainage Science and Engineering (Xiangjiaotong [2014] No. 247);</p> <p>2. Presided over the 2013 Hunan Provincial Department of Education Scientific Research Youth Project - Biodegradability Evaluation of Typical Oxide Ore Flotation Reagents (No. 13B009);</p> <p>3. Presided over the 2013 Higher Education Scientific Research Project of Hunan City University - Construction of Application-oriented and Innovative Faculty Based on the Outstanding Engineer Training Program (No.: JK13A007, Department and Bureau Level)</p>	<p>hydrocarbon-based xanthate collectors[J].Journal of Safety and Environment,2015,16(6) :242-245. (CSCD)</p> <p>2. Yan Hengzhen, Gong Wenqi, Mei Guangjun, et al. Study on aerobic biodegradation of amine collectors[J].Journal of Safety and Environment,2011,11(4) :76-81. (CSCD)</p>	Academic Achievement Award of Yiyang City, 2016
8	Deng Jie	<p>1. Invention patent, name of invention and creation: A composite catalyst for treating sewage and preparation method, patent number ZL202210107796.5, authorization announcement date 2023-09-08;</p> <p>2. Presided over the 2020 Collaborative Education Project of the Department of Higher Education of the Ministry of Education: Research on the Teaching Reform of Building Water Supply and Drainage Engineering Curriculum in the Context</p>	<p>1.Experimental Study of the Porous Plate Hydrodynamic Cavitation Device and Removal the Algae in Water[J]. Recent Development on Material Science and Environmental Material,2013,7:569-572(EI).</p> <p>2.Experimental Investigation on Enhance effect of Hydrodynamic cavitation [J]. Advances in Chemical Engineering III., 2013, 7:2865-2869.</p> <p>3.Study on Absorption Experiment of Methylene blue by Nitrifying peat[J]. Sustainable Cities Development and Environment,2012,8:1969-1972(EI)..</p> <p>4.Study of Porous plate hydrodynamic cavitation device for P-Nitrophenol[J]. Chemical Engineering and Material Properties III., 2012.8 (EI).</p>	—



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		<p>of Engineering Education Accreditation (201902099001);</p> <p>3. Presided over the 2008 Outstanding Youth Project of Hunan Provincial Department of Education: Experimental Research on Hydraulic Cavitation and Its Strengthening Effect of Perforated Plates (08C201);</p> <p>4. Presided over the 2008 Hunan Provincial Department of Education General Project: Experimental Research on Hydraulic Cavitation and Its Strengthening Effect of Perforated Plates (08C201)</p>		
9	Li Yuanping	<p>1. Presided over the 2020 Hunan Provincial Natural Science Youth Fund Project: Research on Microbial Remediation of Polybrominated Diphenyl Ether Contaminated Sediment Based on Biochar and Its Mechanism (2020JJ5019)</p> <p>2. Presided over the 2017 Hunan Provincial Department of Education Scientific Research General Project: Research on the simultaneous sensing and detection of heavy metals Cd and Pb in water environment based on 3D gold nanocluster modified gold electrode (17C0305)</p> <p>3. Presided over the 2021 Hunan Provincial Department of Education Outstanding Youth</p>	<p>1. Effects of physicochemical parameters on Actinomyces communities during composting of agricultural waste. Sustainability, 2019, 11(8):2229-2242</p> <p>2. Modification of sludge biochar by MnO₂ to degrade methylene blue: Synergistic catalysis and degradation mechanisms. Journal of Water Process Engineering. 2022, 48:102864. (SCI Zone 2, 1st work)</p> <p>3. Research on the application of gene sensing and immune technology in the detection of environmental pollution control process[M]. Changsha: Central South University Press, 2022. ISBN 978-7-5487-5113-7 (Academic monograph, 一作)</p>	Third Prize of the 3rd Natural Science Outstanding Academic Achievement Award of Yiyang City, 2019



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		Scientific Research Project: Research on the Electron Transport Mechanism of Humus-mediated Reduction and Remediation of Valvalence Heavy Metal Pollution (21B0715) 4. Presided over the 2022 Hunan Provincial Teaching Reform Research Project of Ordinary Colleges and Universities: Research on the Teaching Reform of "Golden Course" in Hydraulics under the Background of First-class Major Construction and Engineering Education Professional Accreditation (HNJG-2022-0995)		
10	Sheng Jianwu	Multi-parameter Detection of Water Quality Based on Ultraviolet-Vis Absorption Spectroscopy Depth Analysis, Natural Science Foundation of Hunan Province. (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. 2.Sheng J W, He M, Shi H C. A highly specific immunoassay for microcystinLR detection based on a monoclonal antibody. Anal Chim Acta. 2007, 603(1): 111-118.	First Prize of Technological Invention Award of the Ministry of Education, 2014, ranked 5th; Third Prize of Zhejiang Science and Technology Progress Award, 2023, ranked 4th
11	Chen Wen	1. Presided over and concluded the project of Hunan Provincial Department of Education, "Research on the Treatment of Pathogenic Microorganisms in Air Conditioning and Cooling Water", Xiang Cai Jiao Zhi [2008] No. 71	Detection and prevention of germs in solar water heater at medium and low temperature[J].Theoretical Research on Urban Construction,2011.6,First author	—



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		2. Presided over and completed the Hunan Provincial Construction Science and Technology Plan Project "Research on the Treatment of Pathogenic Microorganisms in Circulating Cooling Water" (Xiang Jianke [2008] No. 459)		
12	Wen Zhifang	—	Jiangshi Urban Black and Odorous Water Body Treatment - General Contracting (EPC) Design Project of Sewage Interception and Ecological Shoreline Restoration Project of Xiaqionghu (Jingxingsi Area); The design project of Zishan Lake Square in Yiyang City won the 2020 Hunan Sponge City Construction Excellent Design Award; Yuan	1. "Providence Wood Country Project" won the first prize of excellent engineering survey and design in Hunan Province in 2018; 2. "Nanyue Ancient Town Scenic Area Quality Improvement Project" won the third prize of 2020 Hunan Province Excellent Engineering Survey and Design.
13	Zhou Jun	1. Presided over the joint fund project of the	ZHOU Jun, GUO Qianying, YANG Ying, LIU	Excellence Award



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		Natural Science Foundation of Hunan Provincial Department of Science and Technology: "Research on the Working Conditions and Membrane Characteristics of Methyl Mercaptan Treatment by Two-phase Partitioned Biological Trickling Filter Column" (2022JJ50284).	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).	of the 5th Natural Science Outstanding Academic Achievement Award of Yiyang City, 202312
14	Wang	1. Presided over the provincial and municipal joint project of Hunan Provincial Department of Science and Technology: "Research on the Recovery of Metallic Arsenic from Sewage Acid by Iodine-Copper Synergistic Reduction Method" (2023JJ50347); 2. Presided over the general project of Hunan Provincial Department of Education: "Basic Research on the Recovery of Metallic Arsenic in High Sulfuric Acid Media by Copper Chloride Synergistic Reduction" (23C0331)	1. <i>An Wang</i> , Kanggen Zhou*, Xuekai Zhang, Dingcan Zhou, Changhong Peng, Wei Chen*. Arsenic removal from highlyacidic wastewater with high arsenic content by copperchloride synergistic reduction. Chemosphere, 238, 124675, 2020 (CAS 2, JCR Q1). 2. <i>An Wang</i> , 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 (中科院 1 区, JCR Q1). 3. Kanggen Zhou, <i>An Wang</i> , 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 (中科院 2 区, JCR Q1).	—



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15	boundless	<p>1. Presided over the provincial and municipal joint project of Hunan Provincial Department of Science and Technology: "Research on the Formation Mechanism and Health Risk Assessment of Mercury Pollution in Groundwater in Solid Waste Landfill in Dongting Lake Area" (2022JJ50274);</p> <p>2. Presided over the general project of Hunan Provincial Department of Education: "Sources, Migration and Transformation Mechanism of Plant Mercury in the Yuanjiang Section of Dongting Lake Area" (22C0509)</p> <p>3. Presided over the Applied Basic Research and Soft Science Research Program of Yiyang Science and Technology Bureau, "Site Suitability Analysis and Treatment Technology of Solid Waste Landfill in Heli, Xiangyang, Guangdong, China"</p>	<p>1. Liu Yimin; Boundless; WANG Ji; CAI Xiongfei; Zheng Jiawei ; Groundwater Pollution Characteristics and Health Risk Assessment of Valley-type Landfills, Environmental Chemistry, 2022, 41(8): 2540-2550</p>	<p>First Prize of Science and Technology Award of China Nonferrous Metals Industry, 2016</p>
16	Wang Caiwen	<p>1. Presided over the 2020 Ministry of Education Industry-University Cooperation and Collaborative Education Project: Research on Industry-University-Research Practice Teaching System from the Perspective of Outstanding Engineers</p> <p>2. Presided over the general project of Hunan Provincial Department of Education in 2020: Process characteristics of iron-antimony co-</p>	<p>Water Pumps and Pumping Stations, Associate Editor, Peking University Press, 2014</p>	<p>Research and application technology of adsorption and photodegradation of multi-walled carbon nanotube-supported TiO₂ p-chlorobenzene, third prize of Hunan Science and</p>



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		precipitation treatment of antimony-containing wastewater and antimony morphological regulation mechanism (Xiangjiaotong [2020] No. 264, project number 20C0343), 2020-2023 3. Presided over the general scientific research project of Hunan Provincial Department of Education: Research on Photocatalytic Degradation of Typical Persistent Organic Pollutants by Electric Field Regulated Carbon Nanofibers) Xiangjiaotong (2023) No. 361, Project No. 23C032)		Technology Progress Award (ranked fourth), December 2016
17	Jiang Haiyan	1. Presided over the general project of Hunan Provincial Department of Education: "Preparation of Sodium Alginate/Graphene Oxide Composite Film and Its Adsorption Performance on Cu(II)" (16C0303);	1.Tetracycline removal from wastewater by calcined kaolin activated persulfate[J].Chinese Journal of Environmental Engineering,2020,14(9):2494-2505.) 2.New insight into highly efficient removal of tetracycline by calcined hydroxyapatite activated peroxydisulfate: The role of calcium carbonate and phosphate group [J]. Journal of Water Process Engineering,2023,55:104207.	—
18	Deng Yumei	1. Presided over the general project of Hunan Provincial Department of Education in 2018: "Effect of CTAB/Ultrasonic Combination on the Dewatering Performance of Activated Sludge" (18C0840); 2. Presided over the science and technology project of Hunan City University "Effect of Microwave	1. Effect of freezing and quenching on dewatering performance of activated sludge[J].Chinese Journal of Environmental Engineering,2017,11(7):4362-4366.) 2.Sponge City and Water Environment Planning and Construction in Jibu District in Changde City[J]. Sustainability, 2022,15:444	Third Prize of the 3rd Natural Science Outstanding Academic Achievement Award of Yiyang City, 2019



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		<p>Quenching and Tempering on Sludge Dewatering Performance" (2016XJ14)</p> <p>3. Presided over the 2023 Hunan Provincial Education Science "14th Five-Year Plan" project: "Research on the Construction of Evaluation Index System for the Cultivation of High-quality Applied Talents in the Context of Professional Certification" (ND232520)</p>		
19	Lu Sen	<p>1. Presided over the 2020 Hunan City University Open Project: Research on Rural Drinking Water Safety and Early Warning Mechanism</p> <p>2. Presided over the general project of Hunan Provincial Department of Education in 2021: Preparation of amidoxime silica and research on the efficiency of treatment of uranium(VI)-containing wastewater (21C0670)</p>	<p>1. Lu Sen. Analysis of Influencing Factors of Graduate Employability[J]. Quality Management,2017,10(7):199-200.</p> <p>2. Xiong Zhengwei, Lu Sen, Yang Bohao, Wang Zhiyong, Yu Qingwei. Study on the Effect of Filling Rate on Aeration Contact Oxidation Process of Hanging Chains[J]. Environmental Science and Technology,2014,37(5):164-168.] (CSCD)</p> <p>2. Xiong Zhengwei, Lu Sen, Wang Zhiyong, Yu Qingwei, Yang Bohao, Sun Ping. Treatment of River Wastewater by Hanging Chain Biological Contact Oxidation Process[J]. Journal of Environmental Engineering,2014,8(7):2748-2752. (CSCD)</p> <p>LU Sen,YIN Yueqiang,SHU Jinkai. Preparation of functionalized ethyl SiO₂ by amidoxime and its adsorption of U(VI.)[J].Natural Science,2023,5(9):1-3.)</p>	—



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			4. Lu Sen, Shu Jinkai. Exploration of teaching reform of "Water Supply and Drainage Instrumentation and Control" under the background of "new engineering + professional certification"[J].China Teaching Work,2023,9(72):127.)	
20	Li	1. Presided over the general project of Hunan Provincial Department of Education in 2019: Ultrasonic-template polymerization cationic polyacrylamide (TPAD) and its sludge quenching and tempering application (19C0376)	1. Li Hao, Xie Min, Wang Aihe, Jiang Haiyan. Effect of ultrasonic combined with CPAM on sludge structure and dewatering performance[J].Popular Standardization,2020(22):182-183.) 2. Li Hao, Wang Aihe. Study on adsorption properties of modified tea pomace/kaolin composites on ammonia nitrogen in water[J].Journal of Hunan City University (Natural Science),2017,26(06):76-78.)	—
21	Shu Jinkai	1. Presided over the general project of Hunan Provincial Department of Education in 2020: Study on the efficiency of hydraulic cavitation and MWCNTs/TiO ₂ photocatalytic treatment of pyridine-containing wastewater (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).	Excellence Award of the 5th Natural Science Outstanding Academic Achievement Award of Yiyang City, 2023
22	Deng Zhenning	1. Presided over the 2024 Hunan Provincial Department of Education Scientific Research General Project: Construction of High Stability and Cheap Solid Adsorbents for Carbon Dioxide	[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	—



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		Capture and Research on Efficient Capture Mechanism (24C0467).	carbon adsorbents. Separation and Purification Technology, 2023, 308, 122942-122948 [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 Zone 1 Journal).	