



田双红

环境工程系 教授

基本情况

田双红：教授、硕士生博士生导师。近年来主要从事污染控制理论与技术的教学和科研，主要研究方向为环境功能（催化、吸附）材料的制备与应用、催化高级氧化理论与技术、固体废弃资源化等。先后主持国家自然科学基金青年基金及面上项目、广东省自然科学基金面上项目、中央高校基本科研基金等多项项目。在*Environ. Sci. Technol.* (IF 6.198), *Applied Catalysis B* (IF 9.446), *J. Hazard. Mater.* (IF 6.065), *Chem. Eng. J* (IF 6.216)等国际学术刊物发表SCI论文80余篇。授权中国专利7件。

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主要研究方向

- (1) 环境功能材料制备与应用
- (2) 催化高级氧化理论与技术
- (3) 固体废弃物资源化

讲授主要课程

- (1) 《环境污染控制技术与原理》博士生
- (2) 《环境仪器分析》研究生
- (2) 《环境化工原理》本科生
- (3) 《画法几何与工程制图》本科生

教育及工作经历



1997-2001年 沈阳工业大学
2003-2006年 中科院广州化学研究所
2006-2009年 中山大学 物理科学与工程技术学院
2006-2007年 加拿大Mcgill大学 化学院
2016-2017年 美国加州大学河滨分校UCR 化学院
2009-至今年 中山大学环境科学与工程学院环境工程系

科研项目

1. 国家自然科学基金项目 “非均相臭氧催化剂MO_x(M=Mg, Ce, Mn, Ti)的晶面调控及性能研究, 2018.01-2021.12
2. 国家自然科学基金青年项目 “膜/疏水Mn基氧化物催化臭氧氧化耦合系统及其净水特性的研究” 2011.8-2014.12
3. 广东省自然科学基金项目 “臭氧催化剂CeO₂的晶面取向抑制溴酸盐生成的影响规律与机理研究” 2019.11-2022.9
4. 广东省自然科学基金项目 “择优暴露(111)晶面的MgO催化臭氧氧化研究” 2015.1-2018.1
5. 高校基本科研业务费 “变价双金属氧化物的分子设计、疏水改性及其催化臭氧氧化机理研究” 2012.1-2014.12
6. 中国博士后科学基金 “表面多孔生物亲和高效悬浮填料的研制及其应用研究” 2010.11-2011.12

代表论文与著作

1. Li P, Zhan SJ, Yao L, Xiong Y, **Tian SH***, Highly porous α -MnO₂ nanorods with enhanced defect accessibility for efficient catalytic ozonation of refractory pollutants, *J. Hazard. Mater.* 2022,437, 129235.
2. Feng JX, Zhang TT, Sun JX, Zhu JZ, Yan W, **Tian SH***, Xiong Y*, Improvement of sewage sludge dewatering by piezoelectric effect driven directly with pressure from pressure filtration: Towards understanding piezo-dewatering mechanism, *Water Res.* 2022, 209, 117922.
3. Zhan SJ, Hu XE, Lou ZC, Zhu JZ, Xiong Y, **Tian SH***, In-situ growth of defect-enriched NiO film on nickel foam (NF@NiO) monolithic catalysts for ozonation of gaseous toluene, *J. Alloys. Comp.* 2022, 893, 162160.
4. Chen XX, Zhan SJ, Chen DS, He C, **Tian SH***, Xiong Y, Grey Fe-CeO_{2- σ} for boosting photocatalytic ozonation of refractory pollutants: Roles of surface and bulk oxygen vacancies. *Appl. Catal. B* 2021, 286, 119928.
5. **Tian SH***, Zhan SJ, Lou ZC, Zhu JZ, Feng JX, Xiong Y, Electrodeposition synthesis of 3D-NiO_{1- δ} flowers grown on Ni foam monolithic catalysts for efficient catalytic ozonation of VOCs, *J. Catal.* 2021, 398, 1–13.
6. Li SY, Zhan SJ, Sun JX, Yao LA, Zhu JZ, Feng JX, Xiong Y*, **Tian SH***, Enhanced ozonation of pollutants by MgO nanoclusters/sewage sludge-derived hierarchical porous carbon: Experimental and theoretical study, *Environ. Sci.-Nano*, 2021, 8, 2569.
7. Chen X, Yang H, Au C, **Tian SH***, Xiong Y*, Chang Y, Efficiency and mechanism of pollutant degradation and bromate inhibition by faceted CeO₂ catalyzed ozonation: Experimental and theoretical study. *Chem. Eng. J.* 2020, 390.
8. Lu J, Sun J, Chen X, **Tian SH***, Chen D, He C, Xiong Y*, Efficient mineralization of aqueous antibiotics by simultaneous catalytic ozonation and photocatalysis using MgMnO₃ as a bifunctional catalyst. *Chem. Eng. J.* 2019, 358, 48–57.
9. Yang J, Feng J, Li W, Chen X, Liu X, Ruan J, Qiu R, Xiong Y*, **Tian SH***, A resource-utilization way of the waste printed circuit boards to prepare silicon carbide nanoparticles and their photocatalytic application. *J. Hazard. Mater.* 2019, 373, 640–648.



10. Feng J, Sun J, Liu X, Zhu J, Xiong Y, **Tian SH***, Enhancement and mechanism of nano-BaTiO₃ piezocatalytic degradation of tricyclazole by co-loading Pt and RuO₂. *Environ. Sci.-Nano* 2019, 6 (7), 2241–2252.
11. **Tian SH***, Xu S, Liu J, He C, Xiong Y*, Feng P, Highly efficient removal of both cationic and anionic dyes from wastewater with a water-stable and eco-friendly Fe-MOF via host-guest encapsulation. *J. Clean. Prod.* 2019, 239.
12. Li SY, Feng J, **Tian SH***, Lan S, Fan C, Liu X, Xiong Y*, Tuning role and mechanism of paint sludge for characteristics of sewage sludge carbon: Paint sludge as a new macro-pore forming agent. *J. Hazard. Mater.* 2018, 344, 657–668.
13. Li WQ, Wen ZH, **Tian SH***, Shan LJ, Xiong Y*, Citric acid-assisted hydrothermal synthesis of a self-modified Bi₂SiO₅/Bi₁₂SiO₂₀ heterojunction for efficient photocatalytic degradation of aqueous pollutants. *Catal. Sci. Technol.* 2018, 8 (4), 1051–1061.
14. Feng J, Fu Y, Liu X, **Tian SH***, Lan S, Xiong Y*, Significant improvement and mechanism of ultrasonic inactivation to Escherichia coli with piezoelectric effect of hydrothermally synthesized t-BaTiO₃. *ACS Sustain. Chem. Eng.* 2018, 6 (5), 6032–6041.
15. Chen J, Xu S, Yang H, Au C, **Tian SH***, Xiong Y*, Ozonation inactivation of Escherichia coli in aqueous solution over MgO nanocrystals: modelling and mechanism. *J. Chem. Technol. Biotechnol.* 2018, 93 (6), 1648–1654.
16. Lan S, Feng J, Xiong Y*, **Tian SH***, Liu S, Kong L, Performance and mechanism of piezocatalytic degradation of 4-Chlorophenol: Finding of effective piezo-dechlorination. *Environ. Sci. Technol.* 2017, 51 (11), 6560–6569.
17. Feng J, Li S, Sheng Y, Xiong Y*, Lan S, **Tian SH***, Kong L, Fan C, Remarkable improvement of cycling Fenton process for catalytic degradation of phenol: Tuning of triggering effect. *Appl. Catal. A* 2017, 542, 21–27.
18. Feng J, Lan S, Yao C, Xiong Y*, **Tian SH***, Electro-generation of NaOH-H₂SO₄ and simultaneous degradation of Acid orange 7 from Na₂SO₄-containing wastewater by Ti/IrO₂ electrodes. *J. Chem. Technol. Biotechnol.* 2017, 92 (4), 827–833.
19. Lan S, Xiong Y*, **Tian SH***, Feng J, Xie T, Enhanced self-catalytic degradation of CuEDTA in the presence of H₂O₂/UV: Evidence and importance of Cu-peroxide as a photo-active intermediate. *Appl. Catal. B* 2016, 183, 371–376.
20. Lu J, Wei X, Chang Y, **Tian SH***, Xiong Y*, Role of Mg in mesoporous MgFe₂O₄ for efficient catalytic ozonation of Acid Orange II. *J. Chem. Technol. Biotechnol.* 2016, 91 (4), 985–993.
21. Xiao L, Xiong Y*, **Tian SH***, He C, Su Q, Wen Z, One-dimensional coordination supramolecular polymer Cu(bipy)(SO₄)_n as an adsorbent for adsorption and kinetic separation of anionic dyes. *Chem. Eng. J.* 2015, 265, 157–163.
22. Wu Z, Kong L, Hu H, **Tian SH***, Xiong Y*, Adsorption performance of hollow spherical sludge carbon prepared from sewage sludge and polystyrene foam wastes. *ACS Sustain. Chem. Eng.* 2015, 3 (3), 552–558.
23. Sun H, Chen T, Kong L, Cai Q, Xiong Y*, **Tian SH***, Potential of sludge carbon as new granular electrodes for degradation of Acid Orange 7. *Ind. Eng. Chem. Res.* 2015, 54 (20), 5468–5474.
24. Qian W, Zhang J, Xiong Y*, Chen X, **Tian SH***, Kong L, Guo Y, Construction and performance of a novel integrative Fenton-like and upward flow biological filter bed. *Chem. Eng. J.* 2015, 273, 166–172.
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26. Chen X, Kong L, Wang X, **Tian SH***, Xiong Y*, Accelerated start-up of moving bed biofilm reactor by using a novel suspended carrier with porous surface. *Bioprocess Biosystems Eng.* 2015, 38 (2), 273–285.



27. Chen J, **Tian SH***, Lu J, Xiong Y*, Catalytic performance of MgO with different exposed crystal facets towards the ozonation of 4-chlorophenol. Appl. Catal. A 2015, 506, 118–125.
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30. **田双红**, 詹淑娟, 姚岚, 熊亚, 一种高比表面积 α -MnO₂纳米棒及其制备方法与应用, ZL202110616594.9 (已授权)
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32. **田双红**, 陆江, 熊亚, 一种表面多孔的氧化镁-污泥碳空心球臭氧催化剂及其制备方法和应用, ZL201810179616.8 (已授权)
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34. **田双红**, 姜臻成, 熊亚, 一种氧化镍纳米花/泡沫镍及其电沉积制备和应用, ZL201910889194.8 (已授权)
35. **田双红**, 张晓霞, 熊亚, 一种CuO_x纳米簇及其作为臭氧催化剂的应用, ZL201911365013.8 (已授权)
36. **田双红**, 牟巧娜, 熊亚, 一种从抛光废料回收稀土的低温环保方法, ZL201810942040.6 (已授权)

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