



主管/主办：中海油天津化工研究设计院有限公司

ISSN 1005-829X

CN 12-1087/X

工业水处理[®]

INDUSTRIAL WATER TREATMENT

2.

中文核心期刊 中国科技核心期刊 中国期刊方阵双效期刊 全国石油和化工期刊百强榜精品期刊

2021/ NO.2
VOL.41



河南清水源科技股份有限公司
电话：0391-6089345
网址：www.qywt.com.cn



做有益社会，服务全球的百年企业
股票代码：300437

关注环境 关爱地球

工业水处理板块

- ◎药剂研发生产销售
 - ◎水云踪智能服务
 - ◎工业复杂废水治理
- 生态环保板块**
- ◎市政工程村镇生活污水
 - ◎生态修复河道治理

围绕以水为核心的环保产业链发展
做大做强五大板块业务
打造国内一流 世界领先的环保企业

ISSN 1005-829X



9 771005 829217

02>

工业水处理

GONGYE SHUICHULI

(月刊)

1981 年创刊

2021 年第 2 期 (总第 360 期)

Vol. 41 No.2

主 编：于海斌

副 主 编：李绍全 明云峰

主管：中海油天津化工研究设计院有限公司

主办：中海油天津化工研究设计院有限公司

编辑：《工业水处理》编辑部

出版：《工业水处理》编辑部

地址：(300131)天津市红桥区丁字沽三号路 85 号

编辑部电话：(022)26689330

广告部电话：(022)26689033 26678212

E-mail:iwt@iwt.cn

网址：www.iwt.cn

微信公众号：iwt1981

印刷：天津中铁物资印业有限公司

责任编辑：侯金萍



扫一扫

关注《工业水处理》公众号

国内总发行：天津市邮政报刊发行局

国外总发行：中国国际图书贸易总公司

中国标准连续出版物号：ISSN 1005-829X

国内统一连续出版物号：CN 12-1087/X

国内订阅：全国各地邮局(所)

邮发代号：国内 6-61 国外 4515MO

发行范围：公开发行

广告备案号：津红监管广登[2019]1 号

商标注册号：728782

出版日期：2021-02-20

定 价：国内 30.00(元)

国外 16.00(\$)

本刊入选

- 全国中文核心期刊
- 中国期刊方阵双效期刊
- 中国科技论文统计源期刊(核心期刊)
- 中国科学引文数据库
- 美国化学文摘
- 俄罗斯《文摘杂志》
- 美国剑桥科学文摘
- 日本科学技术振兴机构数据库

目 次

专论与综述

钼酸铋基异质结型光催化材料的研究进展

..... 焦长泉 易均辉 莫惠媚 等(1)

人工湿地在修复富营养化水体中的应用及研究进展

..... 孙园 魏心雨 丁怡(8)

厌氧氨氧化工艺的研究与应用进展

..... 李航 姚潇涵 张欣 等(15)

金属催化剂在宽泛 pH 进行 Fenton 反应的进展

..... 李孟宣 盛光遥 何岸飞(20)

热致相分离法制备聚偏氟乙烯膜亲水改性研究进展

..... 金宇涛 林亚凯 田野 等(26)

试验研究

湿法冶金 MVR 废水中溶解性有机溶剂和萃取剂的去除

..... 李恺雄 池勇志 付翠莲 等(33)

接触式蒸发处理垃圾渗滤液膜浓缩液试验研究

..... 戚二兵 黄亚继 袁琦 等(38)

脱硫废水再生回用于海水循环冷却系统的试验研究

..... 郭浩 靳亚鹏 赵达维 等(43)

超声波辅助法制备纳米 FeS 及处理酸性含铬废水试验

..... 狄军贞 赵文琦 杨建国 等(48)

酪蛋白水解物碳源 SBR 生物除磷系统启动

..... 杨鹤 王少坡 张铁凡 等(52)

臭氧预氧化对蛋白类污染物超滤膜污染的影响研究

..... 卢伟 杨子晗 王磊 等(57)

核桃壳活性炭的制备及对水中硝基苯的吸附

..... 温凯云 李红艳 崔建国 等(62)

水处理缓蚀剂——缓溶球的性能研究

..... 郭茹辉 王深琳 李海花 等(67)

次氯酸钠辅助的循环冷却水无磷钝化方案研究	杨恒修 沈虎峻 邹雪锋(71)
载体对短程硝化生物膜特性的影响及机理探究	钟 镛 王 盟 赵白航 等(75)
电子束辐照降解土霉素制药废水 COD 技术研究	宋旺旺 冀 东 武旭阳 等(80)
采选矿废水 COD 降解过程中 ORP 的特性研究	周 杰 刘金勇 闫虎祥 等(84)
颗粒活性炭激活过硫酸盐氧化法深度处理焦化废水	吕志超 宋秀兰 赵青云(88)
多相催化氧化-EGSB 组合工艺处理丙烯酸废水研究	姜晓锋 高明瑜 王诗涵 等(92)
枯草芽孢杆菌耐镉能力驯化及镉吸附特性研究	陈宇婷 盛光遥 谢康颖 等(97)
非自由基介导的氧化铜活化单过硫酸盐降解四环素	邹丛阳 周 锐 赵 彤(102)

油气田水处理

海上低渗油田采出液回注绿色工艺技术开发	周立坤 滕厚开 葛庆峰 等(108)
---------------------	--------------------

分析与监测

连续光源石墨炉原子吸收光谱法测定污泥中的铍	陈泽智 刘 琳 赖胜强 等(112)
-----------------------	--------------------

工程实例

生猪屠宰企业废水处理工程实例	张进福 李瑞芳 闫艳娥(117)
聚糖反应-A ² /O-臭氧催化氧化处理聚氨酯废水的研究	沈克军 陈守文 赵选英 等(120)

经验交流

某 220 MW 超高压机组修后炉水 pH 突降原因分析	李元浩 姜 波 王鹏星(123)
------------------------------	------------------

城市中水回用中膜污染分析及对策	牛 蕚(127)
-----------------	----------

水处理知识讲座	(96)
---------	------

广告目次	(J1)
------	------

工业水处理

GONGYE SHUICHULI

(月刊)

《工业水处理》创刊于 1981 年,是由中海油天津化工研究设计院有限公司主办、国家工业水处理工程技术研究中心协办的专业性科技期刊。重点报道国内外有关工业废水、循环冷却水、锅炉水、工艺用水的水处理技术动态、专题述评、研究报告、工程案例、经验总结、科学管理及行业快讯等内容,适于从事水处理领域的高等院校师生、科研设计单位的工程技术人员及企业的运营管理人订阅。

下期要目

- 非均相光-Fenton 技术在水处理领域的研究进展
- 燃煤电厂脱硫废水零排放技术对比及经济性分析
- 磁声 Fenton 催化氧化联合处理难降解工业废水
- A²O 生物膜工艺强化生物脱氮和污泥减量研究
- 江苏某地区机械电子加工废乳化液污染特征分析
- 电催化氧化技术在有机废水处理中的应用
- 添加零价铁的反硝化系统中发生的主要反应
- 聚偏氟乙烯/聚离子液体共混膜的优化制备
- 纺织印染废水处理的自动化策略与系统设计
- 吡啶废水新型微生物法处理研究进展

Industrial Water Treatment(Monthly)

Established in 1981

Vol.41 ,No.2, 2021

(Serial No.360)

Chief Editor: Yu Haibin

Vice Chief Editor: Li Shaoquan Ming Yunfeng

Sponsored by

CenerTech Tianjin Chemical Research and Design Institute Co.,Ltd.

Edited by

The Editorial Office of Industrial Water Treatment

Published by

The Editorial Office of Industrial Water Treatment

Address: No. 3 Road Dingzigu, Hongqiao District, Tianjin, China

Postcode: 300131

Editorial Office: 86-22-26689330

Advertising Department:

86-22-26689033 26678212

E-mail: iwt@iwt.cn

URL: //www.iwt.cn

Distributed in China by

Tianjin Post Newspaper and Magazine Publishing Bureau

Distributed abroad by

China International Book Trade Co.

Subscribing place:

All the post offices in China

China standard serial number:

ISSN 1005-829X

China serial number:

CN 12-1087/X

Post distributing number:

domestic: 6-61 abroad: 4515MO

Issuing scope: Open Publishing

Publishing date: 2021-02-20

Price: 30.00(CNY)(Domestic)

16.00(US \$)(Foreign)

CONTENTS

SUMMARIES AND THESES ON SPECIAL TOPICS

Research progress on bismuth molybdate heterojunction of photocatalytic materials Jiao Changquan, Yi Junhui, Mo Huimei, et al(1)

Application and research progress of constructed wetland in restoration of eutrophic water body Sun Yuan, Wei Xinyu, Ding Yi(8)

Research and application progress of anaerobic ammonia oxidation process Li Hang, Yao Xiaohan, Zhang Xin, et al(15)

Progress of metal catalysts for Fenton reaction at a wide range of pH Li Mengxuan, Sheng Guangyao, He Anfei(20)

Research progress on hydrophilic modification of polyvinylidene fluoride microporous membranes prepared via thermally induced phase separation method Jin Yutao, Lin Yakai, Tian Ye, et al(26)

RESEARCH AND EXPERIMENT

Removal of dissolved organic solvents and extractants in wastewater of hydrometallurgical MVR Li Kaixiong, Chi Yongzhi, Fu Cuilian, et al(33)

Experimental study on treating landfill leachate membrane concentrate by contact evaporation Qi Erbing, Huang Yaji, Yuan Qi, et al(38)

Reuse of desulphurization wastewater after regeneration for the recirculating cooling seawater system Guo Hao, Jin Yapeng, Zhao Dawei, et al(43)

Preparation of nano FeS by ultrasonic assisted method and treatment of acid chromium containing wastewater Di Junzhen, Zhao Wenqi, Yang Jianguo, et al(48)

Start-up of sodium casein hydrolysate carbon source SBR biological phosphorus removal system Yang He, Wang Shaopo, Zhang Tiefan, et al(52)

Effect of pre-ozonization on protein fouling of ultrafiltration membranes Lu Wei, Yang Zihan, Wang Lei, et al(57)

Preparation of activated carbon from walnut shell and its adsorption of nitrobenzene in water Wen Kaiyun, Li Hongyan, Cui Jianguo, et al(62)

Performance study on water treatment corrosion inhibition-slow dissolving ball Guo Ruhui, Wang Shenlin, Li Haihua, et al(67)

Sodium hypochlorite assisted phosphorus-free passivation program of recirculating cooling water

..... Yang Hengxiu, Shen Hujun, Zou Xuefeng(71)

Effect of carriers on the characteristics of shortcut nitrification biofilm and its mechanism

..... Zhong Lei, Wang Meng, Zhao Baihang, et al(75)

Technical study on COD degradation of oxytetracycline pharmaceutical wastewater by electron beam irradiation technology

..... Song Wangwang, Ji Dong, Wu Xuyang, et al(80)

ORP characteristic during COD degradation of mining wastewater

..... Zhou Jie, Liu Jinyong, Yan Huxiang, et al(84)

Advanced treatment of coking wastewater by persulfate oxidation catalyzed by granular activated carbon

..... Lü Zhichao, Song Xiulan, Zhao Qingyun(88)

Acrylic acid wastewater treatment by combined process of heterogeneous catalytic oxidation—EGSB

..... Jiang Xiaofeng, Gao Mingyu, Wang Shihan, et al(92)

Acclimation of cadmium tolerance and cadmium adsorption characteristics of *Bacillus subtilis*

..... Chen Yuting, Sheng Guangyao, Xie Kangying, et al(97)

Nonradical-mediated copper oxide activation of peroxyomonosulfate to degrade tetracycline

..... Zou Congyang, Zhou Rui, Zhao Tong(102)

WATER TREATMENT IN OIL-GAS FIELD

Development of green technology for produced fluids reinjection in offshore low permeability oilfield

..... Zhou Likun, Teng Houkai, Ge Qingfeng, et al(108)

ANALYSIS AND DETERMINATION

Determination of Beryllium in sludge by graphite furnace atomic absorption spectrometer with continuous light source

..... Chen Zezhi, Liu Lin, Lai Shengqiang, et al(112)

PROJECT CASE

Engineering examples of wastewater treatment for pig slaughter enterprises

..... Zhang Jinfu, Li Ruifang, Yan Yan'e(117)

Treating polyurethane wastewater by glycan reaction— A^2O —ozonation process

..... Shen Kejun, Chen Shouwen, Zhao Xuanying, et al(120)

EXCHANGES OF EXPERIENCES

The reason analysis of pH sudden drop in boiler water of a 220 MW ultra-high-pressure unit after repair

..... Li Yuanhao, Jiang Bo, Wang Pengxing(123)

Analysis and strategy of membrane fouling in recycling utilization of urban reclaimed water Niu Ben(127)

Industrial Water Treatment(Monthly)

Founded in 1981, Industrial Water Treatment is a professional and technical journal sponsored by CenerTech Tianjin Chemical Research & Design Institute Co.,Ltd. and cooperated by the National Engineering & Technology Research Center for Industrial Water Treatment reporting the technical dynamic information, special topic reviews, research reports, engineering cases, summary of experiences, scientific management and industry news flashes, etc. on industrial wastewater, circulating cooling water, boiler water, and process water etc. in China and abroad. It is suitable for teachers and students in colleges and universities, technologists in scientific research and design organizations, and operational & managerial personnel in enterprises in the field of water treatment to subscribe.

Advance Notice

- Research progress of heterogeneous photo-Fenton technology in water treatment
- Technical comparison and economic analysis of desulfurization wastewater zero discharge from coal-fired power plant
- Fenton catalytic oxidation coupled with magnetization and ultrasound technology for refractory industrial wastewater treatment
- Enhanced biological nitrogen removal and sludge reduction by A^2O biofilm process
- Contaminant properties analysis of wasted emulsion from mechanical electronic processing industry in Jiangsu district
- Application of electro-catalytic oxidation technology in organic wastewater treatment
- Main reactions in denitrification system with zero valent iron addition
- Optimization and preparation of the polyvinylidene fluoride/polyionic liquid blend membrane
- Automatic strategy and system design of textile and dyeing wastewater treatment
- Research progress in the treatment of pyridine wastewater by novel microorganism method