



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/TQ

工业水处理
（月刊）

第42卷

第5期

二〇二二年五月

工业水处理[®]

INDUSTRIAL WATER TREATMENT

5

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

2022.05 / NO.5
VOL.42

封面文章

国内外炼焦行业水污染排放标准比较

王帆, 马佳莹, 周雪飞, 张亚雷, 褚华强



ISSN 1005-829X



05>

9 771005 829224

工业水处理

GONGYE SHUICHULI

(月刊)

1981年创刊

2022年5月第42卷第5期

(总第375期)

主编：于海斌

副主编：李绍全

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：陆明

扫一扫

关注《工业水处理》公众号

国内总发行：中国邮政集团公司天津市邮政报

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/TQ

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：2022-05-20

定 价：国内 30.00(¥)

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

高性能疏松纳滤膜的制备研究进展

..... 樊华 王一雯 姜钦亮 范敏 桂双林 韩飞(1)

膜技术在核工业铀废水处理中的应用研究进展

... 周慧 冷佳伦 郭亚丹 刘金生 葛坤朋 张卫民(11)

国内外炼焦行业水污染排放标准比较

..... 王帆 马佳莹 周雪飞 张亚雷 褚华强(19)

微生物电解池去除废水中重金属的性能特征与机制

..... 石秀顶 王静 蒋明 李天国

管文闯 马红艳 朱煊 谢晶(26)

页岩气压裂返排液外排处理技术研究现状及展望

..... 李静 陈天欣 周微 赵靓 刘文士(34)

基于臭氧的复合工艺处理医药废水研究进展

..... 刘汝鹏 张震 宋依辉 孙翠珍(41)

微波生物炭制备影响因素及其环境应用进展

..... 王林 陈杨武 周后珍 谭周亮 王欢(50)

Fenton 氧化处理难降解有机废水研究进展

..... 王锐 刘宪华 王勇 邵宗泽(58)

试验研究

垃圾渗滤液膜浓缩液中总氮深度脱除的工艺优化及微生物机理解析

..... 刘宁 陆杰 罗琦 邱晨晨

杨庆 黄开龙 叶林 张徐祥(67)

ZnCo-ZIF 制备及其活化过硫酸盐降解罗丹明 B 性能研究

..... 王艺 张艺凡 龙世伟 罗世鑫(77)

低温同步短程硝化反硝化可行性研究

..... 张郅昊 张群 孙郁聪 韩鹏

陈元晗 刘庆 徐光景(83)

两级 AO 研间接触氧化工艺治理重度黑臭水体研究

... 黄聪 王静 周金艳 彭聃 任晓玲 李柏林(89)

DSA 阳极处理垃圾渗滤液膜浓缩液控制参数研究

..... 李于晓 余冬元 孟令果(96)

- 改性褐煤对酸性矿山废水中Cr(VI)的吸附性能研究 狄军贞 杨瑞琪 董艳荣 鲍斯航 王显军(103)
- 紫外光下施氏矿物活化过硫酸盐降解罗丹明B 刘慧 周佳兴 任鹏飞 张健
秦俊梅 毕文龙 倪月 刘奋武(110)
- 紫外光活化过硫酸盐脱色处理甲基橙染料的研究 张丹 陈博凯 晁聪 李玉坤
杨书申 炊衣琦 陈彬洁 杨凯峰(117)
- 绿锈-聚二甲基二烯丙基氯化铵絮凝剂的制备及应用 陆永生 徐喜旺 冯威 陈晨 万俊锋(125)
- 三聚吡啶类缓蚀阻垢双效药剂的实验及理论研究 斯绍雄 陈贤 倪小龙 陈玉萍 韩丰泽 吕祥鸿
王晨 张军平 候炳臣 李健(131)
- 有机胍用作海生物抑制剂的性能评价 潘旭东 左鹏 杨喻 康宏磊(140)
- 气升式废水处理反应器内流场和传质特性的研究 吴松 任慧敏(143)
- 电化学氧化-电渗析联合处理丙烯腈四效蒸发凝液 王文虎 赵姗姗 王伟 阎光绪(150)

油气田水处理

- 含压裂返排液采出水处理工艺优化 彭杰 田永刚 马军军 何荣华(157)

分析与监测

- 流式细胞术检测水中细菌总数的方法研究 刘倩 刘小杰(163)

工程实例

- 组合表面流湿地处理化工区污水厂尾水的工艺设计 陈功(169)
- 改良 Bardenpho+BAF 工艺应用于海产品废水的处理 张开海 刘增军 邱林勇(176)
- 基于多模式 A²/O 工艺污水处理厂的设计及运行效果 张磊 张福波 单连斌 王鸯鸯(180)

经验交流

- 尿素漏入对机组水汽品质的影响及关键诊断技术 熊远南(184)
- 水处理知识讲座 (149)

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

- 微生物电解池处理厨余垃圾液化液同步资源化产氢
- 微生物耦合 CdS 光催化降解磺胺甲恶唑的机理研究
- 源分离尿液资源化利用研究进展
- 低碳污水微生物氮转化工艺研究进展
- 两级厌氧氧化工艺对厨余废水的脱氮性能研究
- 基于微生物电化学技术的 BOD 传感器的研究进展
- 基于 H₂O₂ 绿色合成的电化学高级氧化处理苯酚废水
- 碳中和视角下污水处理现状与展望
- MEC 耦合 AnMBR 技术在污水处理中的研究进展
- 基于物料平衡的光合细菌污水资源化碳排放研究

Industrial Water Treatment(Monthly)

Established in 1981

Vol.42, No.5, May 2022
(Serial No.375)

Chief Editor: Yu Haibin

Vice Chief Editor: Li Shaoquan

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/TQ

Post distributing number:

domestic: 6-61 abroad: 4515MO

Issuing scope: Open Publishing

Publishing date: 2022-05-20

Price: 30.00(CNY)(Domestic)
16.00(US \$)(Foreign)

CONTENTS

SUMMARIES AND THESES ON SPECIAL TOPICS

Research progress of preparation of high performance loose nano-filtration membranes FAN Hua, WANG Yiwen, JIANG Qinliang, et al(1)

Research progress of membrane technology in treatment of uranium-containing wastewater from nuclear industry ZHOU Hui, LENG Jialun, GUO Yadan, et al(11)

Comparison of Chinese and foreign water pollution discharge standards of coking industry WANG Fan, MA Jiaying, ZHOU Xuefei, et al(19)

Performance characteristics and mechanism of removal of heavy metal ions from wastewater by microbial electrolytic cell SHI Xiuding, WANG Jing, JIANG Ming, et al(26)

Research status and prospect of the shale gas fracturing flowback fluids discharge treatment technology LI Jing, CHEN Tianxin, ZHOU Wei, et al(34)

Research progress in pharmaceutical wastewater treatment by ozone-based combined technology LIU Rupeng, ZHANG Zhen, SONG Yihui, et al(41)

Research on effecting factors of microwave biochar preparation and its environmental application WANG Lin, CHEN Yangwu, ZHOU Houzhen, et al(50)

Research progress of Fenton oxidation treatment refractory organic wastewater WANG Rui, LIU Xianhua, WANG Yong, et al(58)

RESEARCH AND EXPERIMENT

Deep removal efficiency of total nitrogen from landfill leachate membrane concentrate: Process optimization and microbial mechanism analysis LIU Ning, LU Jie, LUO Qi, et al(67)

Preparation of ZnCo-ZIF and its application in persulfate activation for Rhodamine B degradation WANG Yi, ZHANG Yifan, LONG Shiwei, et al(77)

Feasibility of simultaneous nitration and denitrification at low temperature ZHANG Zhihao, ZHANG Qun, SUN Yucong, et al(83)

Treating severe black and odorous water by two-stage AO gravel contact oxidation process HUANG Cong, WANG Jing, ZHOU Jinyan, et al(89)

Control parameters of dimensionally stable anode treated landfill leachate membrane concentrate LI Yuxiao, YU Dongyuan, MENG Lingguo(96)

Adsorption characteristics of modified lignite for Cr(VI) in acid mine drainage DI Junzhen, YANG Ruiqi, DONG Yanrong, et al(103)

- Degradation of Rhodamine B by schwertmannite activated persulfate under UV light
..... LIU Hui, ZHOU Jiaxing, REN Pengfei, et al(110)
- Decolorization treatment methyl orange dye by ultraviolet activated persulfate process
..... ZHANG Dan, CHEN Bokai, CHAO Cong, et al(117)
- Preparation and application of green rust polydimethyldiallyl ammonium chloride(GR-PDM) composite flocculant
..... LU Yongsheng, XU Xiwang, FENG Wei, et al(125)
- Experimental and theoretical investigation of trimeric pyridinium agent as bi-functional inhibitor for corrosion and scaling
..... SI Shaohiong, CHEN Xian, NI Xiaolong, et al(131)
- Performance evaluation of organic guanidine as marine organisms' inhibitor
..... PAN Xudong, ZUO Peng, YANG Yu, et al(140)
- Flow field and mass transfer characteristics in airlift wastewater treatment reactor
..... WU Song, REN Huimin(143)
- Treatment of acrylonitrile quadruple effect evaporation condensate by electrochemical oxidation-electrodialysis united technology
... WANG Wenhua, ZHAO Shanshan, WANG Wei, et al(150)

WATER TREATMENT IN OIL-GAS FIELD

- Optimization of produced water containing fracturing flowback fluid treatment process
..... PENG Jie, TIAN Yonggang, MA Junjun, et al(157)

ANALYSIS AND DETERMINATION

- Detecting total bacteria number in environmental water by flow cytometry
..... LIU Qian, LIU Xiaojie(163)

PROJECT CASE

- Process design of combined surface flow wetland to treat tail water from wastewater treatment plant in chemical industry park
..... CHEN Gong(169)
- Application of improved bardenpho combined BAF process in wastewater treatment of marine products
..... ZHANG Kaihai, LIU Zengjun, QIU Linyong(176)
- Design and performance of a wastewater treatment plant based on multi-mode A²/O process
..... ZHANG Lei, ZHANG Fubo, SHAN Lianbin, et al(180)

EXCHANGES OF EXPERIENCES

- Effects of urea leakage into boiler thermodynamic system on steam-water quality and key techniques on diagnose its existence in coal power units
..... XIONG Yuannan(184)

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

- Microbial electrolysis cell treating liquefied kitchen waste with simultaneously resourceful hydrogen production
- Mechanism of microbial coupling CdS photocatalytic degradation of sulfamethoxazole
- Research progress on resource utilization of source-separated urine
- Research progress on the microbial technology of nitrogen transformation from low carbon wastewater
- Performance research on two-stage anaerobic ammonia oxidation(Anammox) process for removing nitrogen in kitchen wastewater
- Research advances on BOD sensor based on microbial electrochemical technology
- Treatment of phenol wastewater by electrochemical advanced oxidation based on H₂O₂ green synthesis
- Current situation and prospect of wastewater treatment under the perspective of carbon neutralization
- Research advances of microbial electrolytic cell integrated with anaerobic membrane bioreactor in wastewater treatment
- Carbon emission of photosynthetic bacteria wastewater bioconversion technology based on material balance algorithm