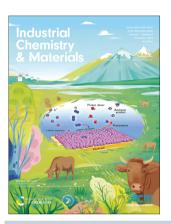
Industrial Chemistry & Materials

An international journal of significant innovative research and major technological breakthroughs in all aspects of industrial chemistry and materials rsc.li/icm

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

IN THIS ISSUE

ISSN 2755-2500 CODEN ICMNCZ 1(4) 467-628 (2023)



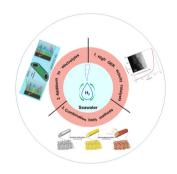
Cover See Leiduan Hao. Zhenyu Sun et al., pp. 563-581. Image reproduced by permission of Zhenyu Sun from Ind. Chem. Mater., 2023, 1, 563.

THEMED ISSUE ARTICLES

MINI REVIEWS

Cutting-edge methods for amplifying the oxygen evolution reaction during seawater electrolysis: a brief synopsis

Xiang Lyu* and Alexey Serov



Recent progress in high-loading single-atom catalysts and their applications

Jiahui Luo, Geoffrey I. N. Waterhouse, Lishan Peng* and Qingjun Chen*



Editorial Staff

Managing Editor

Jing Kong

Assistant Editors

Huixian Dong, Xitong Wang

Content Development Editor Yuwei Liang

Editorial Production Manager Daniella Ferluccio

Regional Publisher

Publisher

Neil Hammond

Journals Launch Manager

Kathryn Gempf

For queries about submitted papers, please contact Sarah Whitbread Editorial Production Manager, in the first instance. E-mail: icmprod@rsc.org

For pre-submission queries, please contact Jing Kong, Managing Editor Email: icm@rsc.org

ICM (Print ISSN 2755-2608; Online ISSN 2755-2500) is published 4 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK,

ICM is a Gold Open Access journal and all articles

Whilst this material has been produced with all due care, the Royal Society of Chemistry cannot be held responsible or liable for its accuracy and completeness, nor for any consequences arising from any errors or the use of the information contained in this publication. The publication of advertisements does not constitute any endorsement by the Royal Society of Chemistry or Authors of any products advertised. The views and opinions advanced by contributors do not necessarily reflect those of the Royal Society of Chemistry which shall not be liable for any resulting loss or damage arising as a result of reliance upon this material. The Royal Society of Chemistry is a charity, registered in England and Wales, Number 207890, and a company incorporated in England by Royal Charter (Registered No. RC000524), registered office: Burlington House, Piccadilly, London W1J 0BA, UK. Telephone: +44 (0) 207 4378 6556.

Advertisement sales:

Tel +44 (0) 1223 432246 Fax +44 (0) 1223 426017 E-mail advertising@rsc.org

For marketing opportunities relating to this journal, contact marketing@rsc.org

Industrial Chemistry & Materials

rsc.li/icm

Industrial Chemistry & Materials (ICM) publishes significant innovative research and majortechnological breakthroughs in all aspects of industrial chemistry and materials, with a particular focus on the important innovation of low-carbon chemical industry, energy and functional materials.

Editor-in-Chief

Suojiang Zhang, Institute of Process Engineering, CAS, China Henan University, China

Associate Editor

Maohong Fan, University of Wyoming, USA Chao Lu. Zhengzhou University/Beijing University of Chemical Technology, China Anja V. Mudring, Aarhus University,

Rong Sun. Shenzhen Institute of Advanced Electronic Materials, CAS, China Quanhong Yang, Tianjin University, China Shouliang Yi, National Energy Technology Laboratory, USA

Tierui Zhang, Technical Institute of Physics and Chemistry, CAS, China Xiangping Zhang, Institute of Process Engineering, CAS, China

Advisory board

Matthias Beller, LIKAT Rostock, Germany Xianhe Bu, Nankai University, China Yu Fang, Shaanxi Normal University, China Jerzy Leszczynski, Jackson State University, Qilong Ren, Zhejiang University, China Blake A. Simmons, Lawrence Berkeley National Laboratory, USA Chunming Xu, China University of Petroleum, China

Donghui Zhang, Dalian Institute of Chemical Physics, CAS, China

Editorial board members

Santiago Aparicio, University of Burgos,

Hongbin Cao, Institute of Process Engineering, CAS, China George Zheng Chen, University of

Nottingham, UK Liwei Chen, Shanghai Jiao Tong University,

Weihua Chen, Zhengzhou University, China Walid Daoud, City University of Hong Kong,

Shoubhik Das, University of Antwerp, Belgium

Xianfeng Fan, University of Edinburgh, UK Mara G. Freire, University of Aveiro, Portugal Feng Gao, Linkoping University, Sweden Yanlong Gu, Huazhong University of Science and Technology, China

Ruilan Guo, University of Notre Dame, USA Yu Han, King Abdullah University of Science and Technology, Saudi Arabia

Niklas Hedin, Stockholm University, Sweden Peter Hesemann, University of Montpellier,

John D. Holbrey, Queen's University Belfast,

Xu Hou, Xiamen University, China Yongsheng Hu, Institute of Physics, CAS, Anker Degn Jensen, Technical University of Denmark, Denmark Xiaoyan Ji, Lulea University of Technology,

Sweden Arjan W. Kleij, Institute of Chemical

Research of Catalonia, Spain Changzhi Li, Zhejiang University, China Xianfeng Li, Dalian Institute of Chemical Physics, CAS, China

Yingwei Li, South China University of Technology, China Di-Jia Liu, Argonne National Laboratory, USA

Jianmei Lu, Soochow University, China Xiang Ma. East China University of Science and Technology, China

Anton Middelberg, The University of Adelaide, Australia Kotohiro Nomura, Tokyo Metropolitan

University, Japan Lijia Pan, Nanjing University, China Srikanth Pilla, Clemson University, USA Albert Poater, University of Girona, Spain

Jieshan Qiu, Beijing University of Chemical Technology, China Mark B. Shiflett, University of Kansas, USA Weiqun Shi, Institute of High Energy

Physics, CAS, China Seema Singh, Joint BioEnergy Institute, USA Zhi Sun, Institute of Process Engineering,

CAS, China

Atsushi Urakawa, Delft University of Technology, Netherlands Xiangjian Wan, Nankai University, China Guoxiu Wang, University of Technology Sydney, Australia

Jianguo Wang, Zhejiang University of Technology, China

Yapei Wang, Renmin University of China,

Yuen Wu, University of Science and Technology of China, China Qun Xu, Zhengzhou University. China Yijun Xu, Fuzhou University, China Feng Yan, Soochow University, China Chunxia Zhao, The University of Adelaide,

Huijun Zhao, Griffith University, Australia Haitao Zhang, Institute of Process Engineering, CAS, China Xin Zhang, Institute of Process Engineering, CAS, China

Ying Zhang, University of Science and Technology of China, China Gengfeng Zheng, Fudan University, China Ying Zheng, Western University, Canada

Information for Authors

Full details on how to submit material for publication in ICM are given in the Instructions for Authors (available from https://www. rsc.org/journals-books-databases/about-journals/

industrial-chemistry-materials). Submissions should be made via the journal's homepage: rsc.li/icm

Authors may reproduce/republish portions of their published contribution without seeking permission from the Royal Society of Chemistry, provided that any such republication is accompanied by an acknowledgement in the form: (Original Citation)-Reproduced by permission of the Royal Society of Chemistry.

This journal is owned by the © Institute of Process Engineering, Chinese Academy of Sciences, China 2022.

Apart from fair dealing for the purposes of research or private study for non-commercial purposes, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988 and the Copyright and Related Rights Regulation 2003, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the Publishers or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency in the UK. US copyright law is applicable to users in the USA. o∞The paper used in this publication meets the requirements of

ANSI/NISO Z39.48-1992

(Permanence of Paper) Registered charity number: 207890





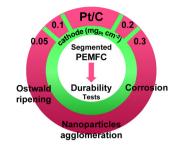


PAPERS

501

Does the platinum-loading in proton-exchange membrane fuel cell cathodes influence the durability of the membrane-electrode assembly?

Ricardo Sgarbi, William Ait Idir, Quentin Labarde, Michel Mermoux, Peizhe Wu, Julia Mainka, Jérôme Dillet, Clémence Marty, Fabrice Micoud, Olivier Lottin and Marian Chatenet*

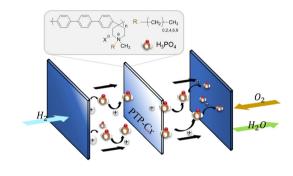


- »The degradation mechanisms do not depend on the cathode Pt loading in contrast to the rate of Ostwald ripening
- »The degradation rate is initially faster for the low cathode Pt loading MEA

516

The effect of grafted alkyl side chains on the properties of poly(terphenyl piperidinium) based high temperature proton exchange membranes

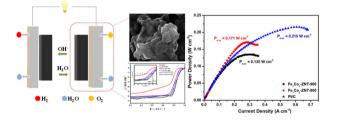
Xuefu Che, Lele Wang, Ting Wang, Jianhao Dong and Jingshuai Yang*



526

Highly active ZIF-8@CNT composite catalysts as cathode materials for anion exchange membrane fuel cells

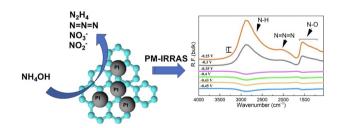
Rohit Kumar, Marek Mooste, Zubair Ahmed, Srinu Akula, Ivar Zekker, Margus Marandi, Maike Käärik, Jaan Leis, Arvo Kikas, Alexey Treshchalov, Markus Otsus, Jaan Aruväli, Vambola Kisand, Aile Tamm and Kaido Tammeveski*



542

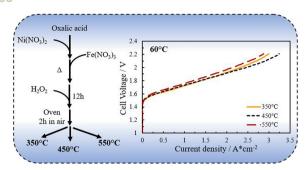
Unveiling the particle size effect and surface reactivity of Pt/C nanoparticles for ammonia electrooxidation using in situ infrared spectroscopy

Niloofar Aligholizadeh K, Ashwini Reddy N, Evans A. Monyoncho and Elena A. Baranova*



PAPERS

553



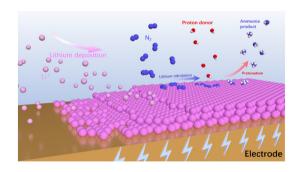
Effect of the calcination temperature on the characteristics of Ni/Fe-oxide electrocatalysts for application in anion exchange membrane electrolysers

Angela Caprì, Irene Gatto, Carmelo Lo Vecchio and Vincenzo Baglio*

REGULAR RESEARCH ARTICLES

REVIEWS

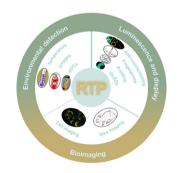
563



Lithium-mediated electrochemical dinitrogen reduction reaction

Muhammad Saqlain Iqbal, Yukun Ruan, Ramsha Iftikhar, Faiza Zahid Khan, Weixiang Li, Leiduan Hao,* Alex W. Robertson, Gianluca Percoco and Zhenyu Sun*

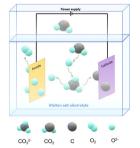
582



Recent progress with the application of organic room-temperature phosphorescent materials

Mengxing Ji and Xiang Ma*

595



 $CO_2 + O^{2-} \rightarrow CO_3^{2-}$ Cathode: $CO_3^{2-} + 4e^- \rightarrow C + 3O^{2-}$ $20^{2-} \rightarrow O_2 + 4e^ CO_2 \rightarrow C + O_2$

General temperature range: $400 - 900 \,^{\circ}C$ Electrolysis technique: constant voltage or constant current

Overview of CO₂ capture and electrolysis technology in molten salts: operational parameters and their effects

Qiuji Zhu, Yimin Zeng* and Ying Zheng*

CORRECTIONS

618

Correction: Hierarchically ordered porous carbon with atomically dispersed cobalt for oxidative esterification of furfural

Wen Yao, Chenghong Hu, Yajie Zhang, Hao Li, Fengliang Wang, Kui Shen, Liyu Chen* and Yingwei Li*

620

Correction: Lithium-mediated electrochemical dinitrogen reduction reaction

Muhammad Saqlain Iqbal, Yukun Ruan, Ramsha Iftikhar, Faiza Zahid Khan, Weixiang Li, Leiduan Hao,* Alex W. Robertson, Gianluca Percoco and Zhenyu Sun*