

廖世军简介

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廖世军，湖北鄂州人.华南理工大学教授，博士生导师，广东省燃料电池重点实验室主任。



专业及教育背景:

从事专业: 物理化学, 催化化学, 燃料电池

教育背景:

1982年学士毕业于华中师范大学黄石分院

1988年硕士毕业于吉林大学

1999年博士毕业于华南理工大学

2000年在南非西开普大学从事博士后研究

2005年在加拿大卡尔加里大学访问研究

研究领域:

多相催化及电催化: 固体酸催化, 多孔催化材料, 电催化剂电化学及燃料电池: 燃料电池催化剂, 燃料电池膜电极制备技术, 燃料电池极板及电堆设计; 大功率燃料电池电堆的开发; 精细化工: 炼油下游产物(烯烃)的高效利用;

学术兼职:

Journal of Nanomaterials 副主编 (Associate Editor)

Current Nanoscience 编委,

Nanoscience and Nanotechnology-Asia 编委,

Open Journal of Microphysics 编委

中国化学会催化专业委员会委员、电化学委员会委员

中国仪表材料学会储能与动力电池专业委员会委员

教育部基础化学教学指导分委员会委员

《华南理工大学学报》编委

《广东化工》常务编委

其他活动:

第 15 届全国催化学术会议组织委员会主席

第十五届国际分子筛大会组织委员会委员

第 3 届国际能源与环境材料大会组织委员会副主席

第 11 届国际清洁能源大会 (The 11th International Conference on Clean Energy

(ICCE-2011) 国际顾问委员会委员

第 25 届世界电动车大会(EVS 25)国际程序委员会委员

香港先进电能研讨会 (Advanced Electrochemical Energy Symposium.) 国际学术委员会委员

成果概述:

- 1.主持和完成各类科研项目 30 项; 其中省级以上科研项目 10 项; 重大项目 1 项;
- 2.省部级科技奖励 4 项; 其中排名第一获教育部高等学校自然科学二等奖 1 项, 科技进步二等奖 1 项;
3. 省级鉴定成果 3 项;
- 4.申请专利 21 项, 获授权 9 项, 申请美国专利 2 项;
5. 发表论文 223 篇, 其中影响因子大于 2.0 的论文 40 篇; H 因子等于 12, 在 JACS 发表论文 2 篇, 单篇最高引用次数达到 115 次。先后有 4 篇文章被 Chemistry World, Nature China, Nature Asia, Nature Materials 选为 Highlight 文章加以评介。
- 6.参编出版编著 2 本, 其中 1 本在国际著名出版社 SPRINGER 出版社出版。
- 7.在国内率先开展羧酸与烯烃直接酯化合成羧酸酯研究和工业化实践, 目前已在全国形成年产 100 万吨规模的乙酸异丙酯、乙酸仲丁酯生产规模; 2007 年, 该技术获教育部科技进步二等奖。
- 8.主持完成的广东省重大科技项目-300KW 燃料电池电站的开发研究, 建成了全球最大的质子交换膜燃料电池电站, 国内外数十家媒体给予了报道宣传。

科技奖励:

1. 质子交换膜燃料电池的应用基础研究, 教育部高等学校自然科学二等奖, 2010, 排名第一;
2. 乙酸/丙烯直接酯化合成乙酸异丙酯合成新工艺及催化剂, 教育部高等学校科技进步二等奖, 2007, 排名第一;
3. 醋酸乙酯合成节能新技术研究, 广州市科技进步三等奖, 2007, 排名第三;

4. 醋酸乙酯节能合成技术, 中国石油与化工协会科技进步三等奖, 排名第三;

代表性专利:

1. 一种微型组合再生式燃料电池, 中国专利申请号: ZL200810029725.8, 2010.6.2 (授权)
2. 用于燃料电池膜电极的电催化剂及其制备方法及膜电极, 中国专利申请号: PCT/CN2010/071413, 2010.3.303.
3. 用于汽车内燃机节能和减排的电化学装置及其制造方法, 中国专利申请号: 201010278368.64.
4. 用于汽车内燃机节能和减排的电化学装置, 中国专利申请号: 201020525128.75.
5. 用于汽车内燃机节能和减排的电化学装置及其制造方法, 中国专利申请号: PCT/CN2010/0777646.
6. 燃料电池用增强型保水复合膜及其制备方法, 中国专利申请号: 200910037906.X7.
7. 用于燃料电池的铂碳类催化剂的固相还原制备方法, 中国专利申请号: 200610036981 (授权)
8. 用于燃料电池的碳载铂基催化剂及其制备方法, 中国专利申请号: 200510102382 (授权)
9. 用于燃料电池膜电极的催化剂的制备方法及燃料电池膜电极, 中国专利申请号: 20091004317510.
10. 一种微型组合再生式燃料电池电源系统, 中国发明专利申请, 200810029725.8 (授权)
11. 一种直接喷涂制备燃料电池膜电极的方法, 中国专利申请号: ZLZL200610035275.4, 2008年4月 (授权)
12. 一种由乙酸和线性丁烯合成乙酸仲丁酯的方法, 中国专利申请号: 200710030230.213.
13. 用于燃料电池催化剂的铂碳类催化剂的固相还原制备方法, 中国专利申请号: 200610036981.0 (授权)
14. 碳载贵金属催化剂及其制备方法, 中国发明专利申请号: 200610123662.3 (授权)
15. 直接喷涂制备燃料电池膜电极的方法, 中国专利申请号: 200610035275.4 (授权)
16. 以杂多酸为促进剂的燃料电池阳极催化剂及其制备方法, 中国专利申请号: 200410051886.9 (授权)
17. 用于燃料电池催化剂的铂碳类催化剂的固相还原制备方法, 中国专利申请号: 200610036981.0 (授权)

18. 用于燃料电池的碳载铂基催化剂及其制备方法, 中国专利申请号: 200510102382.X (授权)

19. 乙酸异丙酯合成工艺及催化剂的制备方法, 中国专利申请号: 03126847.1, 2003年6月13日, 公开号: CN 1483717 A. (授权)

20. 一种光催化剂及其制备方法, 中国专利申请号: 01127860.9 (申请号) 2001 专利授权号: ZL 01 1 27860.9 (授权)

代表性论文:

1. Wu YN, Liao SJ, Su YL, Zeng JH, Dang D. Enhancement of anodic oxidation of formic acid on palladium decorated Pt/C catalyst. JOURNAL OF POWER SOURCES, 2010,195(19): 6459-6462

2. Wu YN, Liao SJ, Wang KN, Chen M, Birss V. High pressure organic colloid method for the preparation of high performance carbon nanotube-supported Pt and PtRu catalysts for fuel cell applications. SCIENCE CHINA-TECHNOLOGICAL SCIENCES, 2010,53(1):264-271

3. Gao, HL; Liao, SJ; Zeng, JH, et al. Platinum decorated Ru/C: Effects of decorated platinum on catalyst structure and performance for the methanol oxidation reaction, JOURNAL OF POWER SOURCES, 2011, 196 (1) : 54-61

4. Su, HN; Zeng, QA; Liao, SJ, et al. High performance membrane electrode assembly with ultra-low platinum loading prepared by a novel multi catalyst layer technique, INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2010, 35 (19) : 10430-10436

5. Liang, ZX; Shi, JY; Liao, SJ, et al. Noble metal nanowires incorporated Nafion (R) membranes for reduction of methanol crossover in direct methanol fuel cells, INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2010, 35 (17) : 9182-9185

6. Su, HN; Xu, LM; Zhu, HP, et al*. Self-humidification of a PEM fuel cell using a novel Pt/SiO₂/C anode catalyst, INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2010, 35 (15) : 7874-7880

7. Hong, P; Liao, SJ; Zeng, JH*, et al. Design, fabrication and performance evaluation of a miniature air breathing direct formic acid fuel cell based on printed circuit board technology, JOURNAL OF POWER SOURCES, 2010, 195 (21) : 7332-7337

8. Wu, YN; Liao, SJ*; Su, YL, et al. Enhancement of anodic oxidation of formic acid on palladium decorated Pt/C catalyst, JOURNAL OF POWER SOURCES, 2010, 195 (19) : 6459-6462

9. Wu, YN; Liao, SJ*; Wang, KN, et al High pressure organic colloid method for the preparation of high performance carbon nanotube-supported Pt and PtRu catalysts for fuel cell applications, SCIENCE CHINA-TECHNOLOGICAL SCIENCES, 2010, 53 (1) : 264-271

10. Wu, YN; Liao, SJ*: Shortened Carbon Nanotubes as Supports to Prepare High-Performance Pt/SCNT and PtRu/SCNT Catalysts for Fuel Cells, ACTA PHYSICO-CHIMICA SINICA, 2010, 26 (3) : 669-674

11. Luo, YL; Liang, ZX; Liao, SJ, Recent Development of Anode Electrocatalysts for Direct Methanol Fuel Cells, CHINESE JOURNAL OF CATALYSIS, 2010, 31 (2) : 141-149

12. Su, HN; Liao, SJ*; Wu, YN, Significant improvement in cathode performance for proton exchange membrane fuel cell by a novel double catalyst layer design, JOURNAL OF POWER SOURCES, 2010, 195 (11) : 3477-3480

13. Zeng, JH; Liao, SJ; Lee, JY, et al. Oxygen reduction reaction operated on magnetically -modified PtFe/C electrocatalyst, INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2010, 35 (3) : 942-948

14. Li, H; Jin, Z; Song, HY, et al*. Synthesis of Co submicrospheres self-assembled by Co nanosheets via a complexant-assisted hydrothermal approach, JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS, 2010, 322 (1) : 30-35

15. Su, HN; Liao, SJ*; Shu, T, et al. Performance of an ultra-low platinum loading membrane electrode assembly prepared by a novel catalyst-sprayed membrane technique, JOURNAL OF POWER SOURCES, 2010, 195 (3) : 756-761

16. Hua-Neng Su, Shi-Jun Liao?, Ting Shu, Hai-Li Gao. Performance of an ultra-low platinum loading membrane electrode assembly prepared by a novel catalyst-sprayed membrane technique. JOURNAL OF POWER SOURCES. 2010, 195 (3) : 756-761

17. Li H, Jin Z, Song HY, Liao SJ. Synthesis of Co submicrospheres self-assembled by Co nanosheets via a complexant-assisted hydrothermal approach. JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS, 2010, 322 (1) : 30-35

18. Li Du, Shijun Liao*, Hussam A. Khatib, J. Fraser Stoddart, Jeffrey I. Zink., Controlled-Access Hollow Mechanized Silica Nanocontainers. Journal of the American Chemical Society, 2009. 131(42): p. 15136-15142.

19. Cui JJ, He W, Liu HT, et al. Ordered hierarchical mesoporous anatase TiO₂ from yeast biotemplates. COLLOIDS AND SURFACES B-BIOINTERFACES, 2009, 74 (1) : 274-278

20. Su HN, Liao SJ, Xu LM. Design, Fabrication and Preliminary Study of a Mini Power Source with a Planar Six-cell PEM Unitised Regenerative Fuel Cell Stack. FUEL CELLS, 2009, 9 (5) : 522-527
21. Y. N. Wu, S.J. Liao, Z.X. Liang, L.J. Yang, R.F. Wang. High-Performance Core-Shell PdPt@Pt/C Catalysts via Decorating PdPt Alloy Cores with Pt. JOURNAL OF POWER SOURCES, 2009, 194 (2) : 805-810
22. Du L, Song HY, Liao SJ. Tuning the morphology of mesoporous silica by using various template combinations. APPLIED SURFACE SCIENCE, 2009, 255 (23) : 9365-9370
23. Xiaobing Li, Shijun Liao, Jinhua Piao, Xueye Wang. Theoretical study on sulfonated and phosphonated poly[(aryloxy)phosphazenes] as proton-conducting membranes for fuel cell applications. EUROPEAN POLYMER JOURNAL, 2009, 45 (8) : 2391-2394
24. J.H. Piao, S.J. Liao, Z.X. Liang, A novel cesium hydrogen sulfate-zeolite inorganic composite electrolyte membrane for polymer electrolyte membrane fuel cell application. JOURNAL OF POWER SOURCES, 2009, 193 (2) : 483-487
25. Li H, Liao SJ. A magnetic-field-assisted solution-phase route to cobalt thin film composed of cobalt nanosheets. JOURNAL OF MATERIALS CHEMISTRY, 2009, 19 (29) : 5207-5211
26. Huang DG, Liao SJ, Zhou WB, et al. Synthesis of samarium- and nitrogen-co-doped TiO₂ by modified hydrothermal method and its photocatalytic performance for the degradation of 4-chlorophenol. JOURNAL OF PHYSICS AND CHEMISTRY OF SOLIDS, 2009, 70 (5) : 853-859
27. Li Du, Quanbing Liu, Xu Yang, Huiyu Song, Zhiyong Fu, Shan Ji, Shijun Liao. Porous Grape-like Sphere Silica with Hydrogen Storage Capability Synthesized by Using Neutral Dual Surfactants as Templates. INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, 2009, 34 (9) : 3810-3815
28. Yi JL, Fu ZF, Liao SJ. A new 3-D microporous Ln(III)-Cu(I) framework constructed by pyridine-3,5-dicarboxylate, JOURNAL OF COORDINATION CHEMISTRY, 2009, 62 (14) : 2290-2298
29. Li H, Liao SJ. Preparation of large Co nanosheets with enhanced coercivity by a magnetic-field-assisted solvothermal approach free of surfactants, complexants or templates. JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS, 2009, 321 (17) : 2566-2570
30. Huaping Zhu, Shijun Liao, Liyan Ye, Xinfu Hu, Bamin Khomami and Michael Z. Hu. A Modified Solid-State Reduction Method to Prepare Supported Platinum

Nanoparticle Catalysts for Low Temperature Fuel Cell Application. CURRENT NANOSCIENCE, 2009, 5 (2) : 252-256

31. Xiaobing Li, Shijun Liao. Theoretical study of proton transfer in triflic acid/water, imidazole and pyrazole clusters. JOURNAL OF MOLECULAR STRUCTURE-THEOCHEM, 2009, 897 (1-3) : 66-68

32. Du Li, Song Huiyu, Yang Xu, Liao Shijun*, A novel hollow sphere mesoporous material synthesized by using DADD template and embedding Nd into framework simultaneously, MICROPOROUS AND MESOPOROUS MATERIALS, 2008, 113(1-3):261-267.

33. Huang Xinjian, Wang Lishi, Liao Shijun, Method of evaluation of electron transfer kinetics of a surface-confined redox system by means of Fourier transformed square wave voltammetry ANALYTICAL CHEMISTRY, 2008, 80(14): 5666-5670.

34. Huang Donggen, Liao Shijun, Quan Shiquan, Synthesis and characterization of visible light responsive N-TiO₂ mixed crystal by a modified hydrothermal process, JOURNAL OF NON-CRYSTALLINE SOLIDS, 2008, 354(33): 3965-3972.

35. Wang Rongfan, Liao Shijun*, High performance Pd-based catalysts for oxidation of formic acid, JOURNAL OF POWER SOURCES, 2008, 180(1):205-208.

36. Wang Rongfan, Liao Shijun*, Platinum free ternary electrocatalysts prepared via organic colloidal method for oxygen reduction, ELECTROCHEMISTRY COMMUNICATIONS, 2008, 10(4): 523-526.

37. Li Hao, Liao Shijun*, Synthesis of flower-like Co microcrystals composed of Co nanoplates in water/ethanol mixed solvent, JOURNAL OF PHYSICS D-APPLIED PHYSICS, 2008, 41(6): 280;

38. Li Hao, Liao Shijun*, Organic colloid method to prepare ultrafine cobalt nanoparticles with the size of 2 nm, SOLID STATE COMMUNICATIONS, 2008, 145(3): 118-121.

39. Fu Zhiyong, Yi Manglong, Chen Yuan, Liao Shijun: From interwoven to noninterpenetration: Crystal structural motifs of two new manganese-organic frameworks mediated by the substituted group of the bridging ligand, EUROPEAN JOURNAL OF INORGANIC CHEMISTRY, 2008,4: 628-634.

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phosphonate chloroform solvate, ACTA CRYSTALLOGRAPHICA SECTION E-STRUCTURE REPORTS ONLINE 63: O3955-U2146 Part 10, OCT 2007 (SCI 217KP.)

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44. Ren JW, Liao SJ(联系人), Liu JM, MNi_{4.8}Sn_{0.2}(M=La, Nd)-supported multi-walled carbon nanotube composites as hydrogen storage materials, CHINESE SCIENCE BULLETIN 52 (12): 1616-1622 JUN 2007 (SCI 183NB.)

45. Rong-Fang Wang, Shi-Jun Liao*(联系人), Hai-Yang Liu, Hui Meng, Synthesis and characterization of Pt-Se/C electrocatalyst for oxygen reduction and its tolerance to methanol, Journal of Power Sources 2007, 171 (2) 471-476, (SCI 219EG.)

46. Liu Junmin, Liao Shijun* (联系人) et al. Preparation of high performance Pt/CNT catalysts stabilized by ethylenediaminetetraacetic acid disodium salt, Fuel Cell, 2007, 7 (5): 402-407 (SCI 227NE)

47. Huang Donggen, Liao Shijun(联系人) et al, Journal of Materials Science, 2007,42(19):8193-8202 (SCI 193UZ. EI)

48. Huang DE, Liao SJ, Quan SQ, et al. Preparation and characterization of anatase N-F-codoped TiO₂ sol and its photocatalytic degradation for formaldehyde, JOURNAL OF MATERIALS RESEARCH, 2007, 22 (9): 2389-2397 (SCI 206GA. EI)

49. WANG Rong fang, L IU Junmin, L IAO Shijun (联系人), High Methanol Tolerance of PdCo /C Catalysts for Oxygen Reduction, 中山大学学报(自然科学版) ACTA SCIENTIARUM NATURALIUM UNIVERSITATIS SUNYATSEN I. 2007, 46:91

50. Jun-min Liu, Shi-jun Liao*, Guo-dong Jiang, Xue-lian Zhang, Leslie Petrik Preparation, characterization and catalytic activity of Zr embedded MSU-V with high thermal and hydrothermal stability, Microporous and Mesoporous Materials, 2006, 95 (1-3), 306-311 (SCI 095KJ)

51. Dong-Gen Huang, Shi-Jun Liao, Jun-Min Liu, Zhi Dang, Leslie Petrik, Preparation of visible-light responsive N-F-codoped TiO₂ photocatalyst by a sol-gel-solvothermal method, Journal of Photochemistry and Photobiology A: Chemistry 2006, 184 (1) 282-288 (SCI 087BH)

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53. Liao, S.; Holmes, K.-A.; Tsapralis, H.; Birss, V. I., High Performance PtRuIr Catalysts Supported on Carbon Nanotubes for the Anodic Oxidation of Methanol, J. Am. Chem. Soc.; (Communication); 2006; 128(11); 3504-3505. (SCI IDS Number: 025XD)
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57. SHIJUN LIAO, V LINKOV, L PETRIK, Electrooxidation of ethanol over a membrane-based electrode, Applied Catalysis A, General, 2004, 258 (2) : 191-196 (SCI EI 774FR)
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