

Curriculum Vitae

Dr. Karthikeyan Gopalsamy

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Work Experience

Associate Professor - Chemistry/Chemical Engineering:

Baikal School of BRICS, Irkutsk National Research & Technical University (INRTU), Russia.

Research Field: Energy Storage/Conversion, Catalysis and Biomass, Nanostructured Materials.

Course taught: Environmental chemistry, Nanotechnology, Electrochemistry, General Chemistry

Senior Research Associate: Materials fabrication and energy applications, Mukum Marine Pvt. Ltd., India. (Jan 2019 to Nov 2019)

Post-Doctoral Researcher: Light weight graphene composite fiber/film electrodes for flexible energy storage devices, Zhejiang University, Hangzhou, China (Jan 2017 to Dec 2018)

Post-Doctoral Researcher: Graphene-metal nano-alloy and Hetero-atom doped Graphene Nanoribbon for supercapacitors and fuel cells, Chonbuk National University, South Korea (April 2015 to July 2016)

Post-Doctoral Researcher: Graphene-metal oxide, nanotubes, fibers for flexible energy storage devices, Zhejiang University, Hangzhou, China (Jan 2013 to Dec 2014)

PhD Research: Anna University, Chennai, TN, India

- Heterogeneous mesoporous catalytic materials
- Use of tri-block co-polymers (P123, F127) for the synthesis of porous materials
- Porous solid acid catalysts (Transition metal supported - MCM-41, KIT-6, KIT-5 materials)
- Catalysis for Multi-component organic reactions

Awards and Fellowships

- Best Paper Award for Hetero-atom Doped Graphene Nanoribbon electrodes for High Performance Supercapacitors (Brain Korea: BK2-Plus Project), 10th Korea-Japan Joint Symposium on Composite Materials, CBNU, Jeonju, South Korea (October 29, 2015).
- Japan International Joint Graduate Fellowship (Porous Catalysis-Nanomaterials), National Institute for Materials science (NIMS), Tsukuba, Japan. (Jan 2009-April 2009).
- Zhejiang University Post-Doctoral Fellowship (All-solid-state flexible devices), Hangzhou, China (2017-2018)
- First prize for paper presentation entitled “Recyclable active heterogeneous mesoporous solid acid catalysts”, National Conference in Material Chemistry (NCMC 2011), Guru Nanak College, Chennai, Tamil Nadu, India, February 9-11, 2011.
- Appeared in “Sciadirect TOP-25 list of most downloaded articles during Oct-Dec 2009” – Ranked 15th, G. Karthikeyan, and A. Pandurangan, *J. Mol. Catal. A: Chem.*, Vol. 311, pp. 36-45, 2009.

List of Publications

1. **Karthikeyan Gopalsamy**, Qiuyan Yang, Shengying Cai, Tieqi Huang, Zhengguo Gao, Chao Gao, Wet-spun poly(ionic liquid)-graphene hybrid fibers for high performance all-solid-state flexible supercapacitors, *J. Energy Chem.* 34, 2019, 104-110 (IF = 9.67).
2. S. A. A. Vandarkuzhali, **G. Karthikeyan*** (Corresponding author), M.P. Pachamuthu, Microwave assisted biosynthesis of *Borassus flabellifer* fruit mediated silver and gold nanoparticles for dye reduction, antibacterial and anticancer, *J. Environ. Chem. Eng.* 9, 2021, 106411 (IF = 5.9).
3. S. A. A. Vandarkuzhali, **G. Karthikeyan*** (Corresponding author), M.P. Pachamuthu, Efficient oxidation of 5-Hydroxymethylfurfural to 2,5-furandicarboxylic acid over FeNPs@NH₂-SBA-15 catalyst in water, *Mol. Catal.* 516, 2021, 111951 (IF = 5.06).
4. S. Mahendran, V.V. Srinivasan, **G. Karthikeyan*** (Corresponding author), M.P. Pachamuthu, Selective oxidation of 5- hydroxymethylfurfural to 2,5-diformylfuran over niobium incorporated MCM-41 catalyst, *Mol. Catal.* 510, 2021, 111682 (IF = 5.06).
5. **Karthikeyan Gopalsamy**, Jayaraman Balamurugan, Tran Duy Thanh, Nam Hoon Kim, Joong Hee Lee, Fabrication of nitrogen and sulfur co-doped graphene nanoribbons with porous architecture for high-performance supercapacitors, *Chem. Eng. J.* 2017, 312 180–190 (IF = 13.27).
6. **Karthikeyan Gopalsamy**, Jayaraman Balamurugan, Tran Duy Thanh, Nam Hoon Kim, David Hui, Joong Hee Lee, Surfactant-free synthesis of NiPd nanoalloy/graphene bifunctional nanocomposite for fuel cell, *Composites Part B: Engineering*, 2017, 114, 319-327 (IF = 9.07).
7. **Karthikeyan Gopalsamy**, Zhen Xu, Bingna Zheng, Tieqi Huang, Liang Kou, Xiaoli Zhao and Chao Gao, Bismuth oxide nanotubes–graphene fiber-based flexible supercapacitors, *Nanoscale*, 2014, 6, 8595 (IF = 7.79).

8. **Karthikeyan Gopalsamy**, and Pandurangan, A., Post synthesis alumination of KIT-6 materials with Ia3d symmetry and their catalytic efficiency towards multicomponent synthesis of 1H-pyrazolo[1,2-]phthalazine-5,10-dione carbonitriles and carboxylates, *J. Mol. Catal. A: Chem.*, 2012, 361, 587 (IF = 5.06).
9. **Karthikeyan Gopalsamy**, and Pandurangan, A., Heteropolyacid (H₃PW₁₂O₄₀) supported MCM-41: An efficient solid acid catalyst for the green synthesis of xanthenedione derivatives, *J. Mol. Catal. A: Chem.*, 2009, 311, 36 (IF = 5.06).
10. **Karthikeyan Gopalsamy**, Zhen Xu, Chao Gao and Eric S.-W. Kong, "The functionalization of carbon nanotubes and nano-onions"- Nanomaterials, Polymers, and Devices: Materials Functionalization and Device Fabrication, 2014, **Wiley Book Review Chapter**, *John Wiley and Sons. Inc.* ISBN: 9781118867204, DOI: 10.1002/9781118867204. E. S. Kong (Editor), Wolfgang Knoll (Foreword by).
11. Jayaraman Balamurugan, **Karthikeyan Gopalsamy**, Tran Duy Thanh, Nam Hoon Kim, Joong Hee Lee, Facile synthesis of vanadium nitride/nitrogen-doped graphene composite as stable high performance anode materials for supercapacitors, *J. Power Sources*, 2016, 308, 149-157 (IF = 9.12).
12. Liang Kou, Tieqi Huang, Bingna Zheng, Yi Han, Xiaoli Zhao, **Karthikeyan Gopalsamy**, H. Y. Sun and C. Gao, Coaxial wet-spun yarn supercapacitors for high-energy density and safe wearable electronics, *Nature Communications*, 2014, 5, 3754 (IF = 14.91).
13. Tieqi Huang, Xingyuan Chu, Shengying Cai, Qiuyan Yang, Hao Chen, Yingjun Liu, **Karthikeyan Gopalsamy**, Zhen Xu, Weiwei Gao, Chao Gao, Tri-high designed graphene electrodes for long cycle-life supercapacitors with high mass loading, *Energy Stor. Mat.*, 2019, 17, 349-357, (IF = 17.78).
14. Jayaraman Balamurugan, Tran Duy Thanh, **Gopalsamy Karthikeyan**, Nam Hoon Kim, JoongHee Lee, A novel hierarchical 3D N-Co-CNT@NG nanocomposite electrode for non-enzymatic glucose and hydrogen peroxide sensing applications, *Biosensors and Bioelectronics*, 2017, 89, 970-977 (IF = 10.61).
15. Qiuyan Yang, Zhen Xu, Bo Fang, Tieqi Huang, Shengying Cai, Hao Chen, Yingjun Liu, **Karthikeyan Gopalsamy**, Weiwei Gao, and Chao Gao, MXene/Graphene Hybrid Fibers for High Performance Flexible Supercapacitors, *J. Mater. Chem. A*, 2017, 5, 22113-22119 (IF = 12.73).
16. Shengying Cai, Tieqi Huang, Hao Chen, Muhammad Salman, **Karthikeyan Gopalsamy** and Chao Gao, Wet-spinning of ternary synergistic coaxial fibers for high performance yarn supercapacitors, *J. Mater. Chem. A*, 2017, 5, 22489-22494 (IF = 12.73).
17. Bingna Zheng, Tieqi Huang, Liang Kou, Xiaoli Zhao, **Karthikeyan Gopalsamy** and Chao Gao, Graphene fiber-based asymmetric micro-supercapacitors, *J. Mater. Chem. A*, 2014, 2, 9736 (IF = 12.73).
18. Tieqi Huang, Bingna Zheng, Liang Kou, **Karthikeyan Gopalsamy**, Zhen Xu, Chao Gao, Yuena Meng and Zhixiang Wei, Flexible high performance wet-spun graphene fiber supercapacitors, *RSC Adv.*, 2013, 3, 23957 (IF = 3.36).
19. Adharvana Chari, M., **Karthikeyan Gopalsamy**., Pandurangan, A., Siddulu Naidu, T., Sathyaseelan, B., Javaid Zaidi, S. M. and Vinu, A., Synthesis of triazolindazolone using 3D mesoporous aluminosilicate catalyst with nanocage structure, *Tetrahedron Lett.*, 2010, 51, 2629 (IF = 2.41).

20. Muhammad Salman, Xingyuan Chu, Tieqi Huang, Shengying Cai, Qiuyan Yang, Xiaozhong Dong, **Karthikeyan Gopalsamy** and Chao Gao, Functionalization of wet-spun graphene films using aminophenol molecules for high performance supercapacitors, *Mater. Chem. Front.*, 2018, 2, 2313-2319. (IF = 6.48).
21. Xiaozhen Hu, Sangeetha Rajendran, Yuansi Yao, Zheng Liu, **Karthikeyan Gopalsamy**, Li Peng and Chao Gao, A novel wet-spinning method of manufacturing continuous bio-inspired composites based on graphene oxide and sodium alginate, *Nano Research*, 2016, 9, 735–744 (IF = 8.89).
22. V. Tharmaraj, S. A.A. Vandarkuzhali, **G. Karthikeyan*** (Corresponding author), M. P. Pachamuthu, Efficient and recyclable AuNPs@aminoclay nanocomposite catalyst for the reduction of organic dyes, 2022, (IF = 4.8) – Revision.
23. G. Bharath. **G. Karthikeyan** et al., Surface engineering of Au nanostructures for plasmon-enhanced electrochemical reduction of N₂ and CO₂ into urea in the visible-NIR region, 2022. (Revision).

Patents Approved: 12 (Chinese) : Graphene based materials for various applications in industry.

Papers Presented in Conferences/Symposia

1. **Karthikeyan, G.**, Balamurugan, J., Kim, N. H. and Lee, J. H., Gold nanoparticles@Graphene-PEDOT:PSS Flexible Hybrid Paper Electrodes for High Performance Supercapacitors, (NANOSMAT Manchester) held in University of Manchester, United Kingdom, 13-16 September 2015.
2. **Karthikeyan, G.**, Balamurugan, J., Kim, N. H. and Lee, J. H. Effect of Hetero atom Doping into Graphene Nanoribbons for High Performance Supercapacitor Electrodes, Hydrogen Conference, South Korea Hydrogen and New Energy Society, South Korea, November 12-13, 2015.
3. **Karthikeyan, G.**, Balamurugan, J., Kim, N. H. and Lee, J. H. Hetero-atom Doped Graphene Nanoribbon Electrodes for High Performance Supercapacitors, 10th Korea-Japan Joint Symposium on Composite Materials, CBNU, Jeonju, South Korea (October 29, 2015).
4. **Karthikeyan, G.** and Pandurangan, A. Role of 12-Phosphotungstic acid supported mesoporous materials involving organic transformation reactions – A leaching study, International Symposium, IIT Madras, Chennai, TN, India, December 10-12, 2008.
5. **Karthikeyan, G.** and Pandurangan, A. HPWA supported MCM-41: An efficient solid acid catalyst for the synthesis of xanthenedione derivatives under liquid phase conditions, Annual Symposium, NCCR, IIT Madras, Chennai, TN, India, August 2, 2008.
6. **Karthikeyan, G.** and Pandurangan, A. Synthesis and characterization of Zr/M (M= Al,Fe &Zn) Mixed Oxides supported on MCM-41 Nanoporous molecular sieves, International Conference on Nano Science and Technology, Indira Gandhi Centre for Atomic Research, Kalpakkam, TN, India, February 27–29, 2008.
7. **Karthikeyan, G.** and Pandurangan, A. Vapour phase oxidation of limonene over bimetallic Co-V-MCM-41, 18th National Symposium & Indo-US Seminar on Catalysis, Catalysis for future fuels, Indian Institute of Petroleum, Dehradun, Uttaranchal, India, April 16-18, 2007.

8. **Karthikeyan, G.**, Balamurugan, J., Kim, N. H. and Lee, J. H. Graphene paper Electrodes for High Performance Supercapacitors, Energy Materials, CBNU, South Korea (May 2015).
9. **Karthikeyan, G.**, Balamurugan, J., Kim, N. H. and Lee, J. H. Fluorinated graphene electrodes for High sensitive Dopamine Biosensors, Hydrogen Conference, South Korea (May 2016).
10. **Karthikeyan, G.** and Pandurangan, Recyclable active heterogenous mesoporous solid acid catalysts over cascade multi component reactions and synthesis of palm based biofuel (fatty acid methyl esters), (NCCM-2011), Gurunanak College, Chennai, India (Feb, 2011).

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Research Summary:

- Carried out research on nanostructured materials, graphene, graphene nanoribbons, CNTs, MXene, polymers, and metal oxides for energy storage applications.
- Catalytic materials for the conversion of biomass model compounds to value-added chemicals.
- Synthesis of metal oxide nanoparticles, nano-alloys, nano-micro porous catalytic materials, metal oxide-porous silica materials and value-based organic reactions.
- Preparation of Hetero-atom doped porous graphene materials (Nitrogen, and Sulfur Doping chemistry)
- Fabrication of Graphene based composite films, wet spun fibers for light weight, flexible, wearable and stable high performance electrodes for energy storage devices (supercapacitors), fuel cells and biosensors.
- Materials characterization and instrumentation techniques : XRD, FTIR, TG-DTA, Raman spectra, XPS, UV, SEM, TEM, AFM, NMR, N₂ isotherms, GC, HPLC and electrochemical analysis instruments (CH instruments, Autolab).

I do hereby confirm that the information furnished above is true to the best of my knowledge.

Dr. Karthikeyan Gopalsamy