

Dr. Bharath Govindan, M.Sc, Ph.D

<p><u>Current position</u> (April, 2016-present)</p> <p>Instructor of Chemistry College of Science and General Studies Department of Chemistry Alfaisal University Riyadh -11533 Kingdom of Saudi Arabia.</p>	<p>DOB: 12-07-1989, (Tamil Nadu, India) Address: 284, Ondikadai, E.M.Pallayam (P.O), Rasipuram (T.K), Namakkal (D.T), Tamil Nadu-636202, India. Nationality: Tamil-Indian E-Mail: sribharath7@gmail.com, bgovindan@alfaisal.edu Mobile: +91 9095222508, +966 596354233 Languages: Tamil, English</p>	
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Education

Doctor of Philosophy (Ph.D)

Branch : Nanoscience and Technology
Ph.D awarded : September-2015
University : Bharathiar University, Coimbatore, Tamil Nadu, India.
Thesis Title : Development of Graphene Based Binary/Ternary Nanocomposites and Systematic Study on their Physico-Chemical, Bio-Physical and Electrochemical Properties

Master of Science (M.Sc)

Branch : Nanoscience and Technology
M.Sc awarded : April-2011
University : Bharathiar University, Coimbatore, Tamil Nadu, India.
Thesis Title : Preparation and Characterization of Amorphous and Nanocrystalline Soft Magnetic Ribbons

Bachelor of Science (B.Sc)

Branch : Physics with allied subject Chemistry and Mathematics
B.Sc awarded : April-2009
University : Arignar Anna Government Arts College-Namakkal, Periyar University-Salem, Tamil Nadu, India.

Research interest

- Design and synthesis of new electrocatalysts and photocatalysts including graphene, boron nitride, and 2D metal oxides sheets for electrochemical energy storage & conversion devices, electrocatalytic reduction of CO₂ & hydrocarbons, hydrogen & fuel production and produced wastewater treatment.
- Electrochemical sensors- biomolecules and toxic metal ions from natural substance

- Hydroxyapatite, gold and metaloxides based graphene nanocomposites for biomedical applications
- Nanotechnology in agricultural applications

Research Experience

Synthesis of high quality and large scale graphene from three different techniques such as modified hummers method, ball milling and potassium intercalation compounds. The obtained graphene was composite with magnetic nanoparticles, 1-D hydroxyapatite (HAp), 1-D magnetic hydroxyapatite, noble metals (Au and Ag Nps), Fe₃O₄-Au, Fe₃O₄-HAp, and HAp-Au nonohybrids. Also, prepared various morphologies of HAp, α -Fe₂O₃ and WO₃ nanostructures. The obtained all the nanocomposites were used for electrochemical sensors (glucose, dopamine, hydrazine, nitrate, 4-Nitrophenol, and etc), biomedical (protein separation, DNA, BSA adsorption and pH controlled release), cancer cell treatment (MCF7 and skin cancer cells), environmental remediation (heavy weight metals removal, dyes removal from wastewater) and plant cultivation. Especially my research experience was nanomaterials for multifunctional applications.

Teaching interest

Graduate level: Material Science, Fundamentals of Nanoscience and Technology, Synthesis and Analytical Techniques, Nanoscale Devices, Thin Films Technology, Nanotechnology for Medical Diagnostics and Therapy, Carbon Nanomaterials, Energy Capture and Storage, Electrochemistry and Nanotechnology in Environments.

High School level: I am very much interesting to interact with school students and I would like to teach Nanotechnology Historical Perspective, Nano in Nature, Common Nanotechnology Applications, Nanotechnology Analytical Measurement, Nanotechnology in Chemistry, Physics and Biology. My main aim is to motivating high school students toward scientific research and develop their thinking abilities. I want to take more classes for worldwide school students and specifically India, Saudi Arabia, Gulf countries, Pakistan, China and Korean students.

Teaching Experience

I gave many invited lecturers about recent nanotechnology, quantum physics, quantum chemistry for engineering, master's students in various Indian colleges and universities. I taught basics nanotechnology into Indian school students.

Research Guidance

Co-guided 5 M.Phil scholars and 15 Master's students during my Ph.D

Awards & scholarships

- **Senior Research Fellowship (CSIR-SRF)**, entitle as “In Situ Synthesis of 1D Fe₃O₄ Nanoparticles Grown on 2D Graphene for Electrochemical Determination of Hydrazine and 4-Nitrophenol in Various Water Samples., received from Human Resource Development Group Council of Scientific & Industrial Research (CSIR), Government of India. (2014 to 2015)
- **Project Fellow-** “Hollow Nanostructures of Hydroxyapatite and its Composites: Shape controlled synthesis and photodegradation studies”, University Grand Commission-Major Research Project (UGC-MRP) Government of India (2012 to 2014)
- **University Research Fellow (URF)**, Bharathiar University, Coimbatore , India (2011 to 2012)
- Certificates of distinguished paper award for “Enzymatic electrochemical glucose biosensors by mesoporous 1D hydroxyapatite-on-2D reduced graphene oxide” J. Mater. Chem. B, 2015, 3, 1360-1370, received from Association of chemical sensors Taiwan, 2015.

Peer reviewer

- ACS-Applied material and Interfaces, Analytical Chemistry
- RSC Advances, Journal of materials chemistry A
- Materials Research Express, Nanotechnology-IOP Publications

Selected Publications

- G. Bharath,* Alberto Naldoni, K. Hasini Ramsait, Ahmed Abdel-Wahab, Rajesh Madhu, Edreese Alsharaeh and N. Ponpandian, Enhanced electrocatalytic activity of gold nanoparticles on hydroxyapatite nanorods for sensitive hydrazine sensors, *Journal of Materials Chemistry A*, 2016,4, 6385-6394
- R. Bakkiyaraj, G. Bharath, K. Hasini Ramsait, Ahmed Abdel-Wahab, Edreese H. Alsharaeh, Shen-Ming Chen and M. Balakrishnan, Solution combustion synthesis and physico-chemical properties of ultrafine CeO₂ nanoparticles and their photocatalytic activity, *RSC Advances*, 2016,6, 51238-51245.
- G. Bharath, Rajesh Madhu, Shen-Ming Chen, Vedyappan Veeramani, D. Mangalaraj and N. Ponpandian., Solvent-free mechanochemical synthesis of graphene oxide and Fe₃O₄-reduced graphene oxide nanocomposites for sensitive detection of nitrite., *Journal of Materials Chemistry A*, 2015, 3, 15529-15539.
- G. Bharath and N. Ponpandian., Hydroxyapatite nanoparticles on dendritic α-Fe₂O₃ hierarchical architectures for heterogeneous photocatalyst and adsorption of Pb (II) ions from industrial waste water., *RSC Advances*., 2015,5, 84685-84693.

- G. Bharath, Rajesh Madhu, Shen-Ming Chen, Vedyappan Veeramani, A. Balamurugan, D. Mangalaraj, C. Viswanathana and N. Ponpandian, Enzymatic electrochemical glucose biosensors by mesoporous 1D hydroxyapatite-on-2D reduced graphene oxide, *Journal of Materials Chemistry B*, 2015, 3, 1360-1370.
- G. Bharath, Veeramani Vedyappan, Shen-Ming Chen, Rajesh Madhu, M. Manivel Raja, A. Balamurugan, D. Mangalaraj, C. Viswanathan and N. Ponpandian, Edge-carboxylated graphene anchoring magnetite-hydroxyapatite nanocomposite for efficient 4-nitrophenol sensor. *RSC Advances*, 2015, 5, 13392-13401.
- G. Bharath, D. Prabhu, D. Mangalaraj, C. Viswanathan and N. Ponpandian, Facile in situ growth of Fe₃O₄ nanoparticles on hydroxyapatite nanorods for pH dependent adsorption and controlled release of proteins, *RSC Advances*, 2014,4, 50510-50520.
- G. Bharath, A. Jagadeesh Kumar, K. Karthick, D. Mangalaraj, C. Viswanathan and N. Ponpandian (2014) Shape evolution and size controlled synthesis of mesoporous hydroxyapatite nanostructures and their morphology dependent Pb(II) removal from waste water, *RSC Advances*, 2014,4, 37446-37457.

Recently accepted & communicated

- *Nanotechnology (IOP publications)*: Environmental friendly large scale synthesis of graphene from KC8 and Fe₃O₄/graphene nanocomposites for adsorption of methyl violet and electrochemical removal of metal ions from aqueous solution
- *Analytical Methods*: Enhanced hydroxyapatite nanorod formation on graphene oxide nanocomposites as a potential candidate for BSA adsorption and pH controlled release and an effective drug delivery platform for cancer therapy
- *ACS Applied material and Interfaces*: Ternary self-assembly of ordered Au-Fe₃O₄-Reduced graphene oxide hybrid nanocomposites for improved electrochemical performance
- *Chemical Communications*: Hydrothermal synthesis of Au/FeCo₂O₄/graphene and its electrochemical sensors.