Dr. BEENA MATHEW

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Academic Profile

- **Ph.D Chemistry** (1991), Mahatma Gandhi University, Kottayam
- **M.Sc. Polymer Chemistry** (1987), Mahatma Gandhi University, Kottayam
- **B.Sc. Chemistry** (1985), University of Kerala, Thiruvananthapuram

Research & Professional Career

- **University Nominee** in the Academic Council of Maharajas College (Autonomous), Ernakulam
- **University Nominee** in the Governing Body of St.Berchaman's College (Autonomous), Changanassery, Kottayam
- **Director of Research**, Mahatma Gandhi University, Kottayam, (February 2017-June 2020)
- **University Nominee** in the Governing Body of CMS College (Autonomous), Kottayam (2018 – 2020)
- **Member, IQAC**, Mahatma Gandhi University, Kottayam
- **Professor & Director**, School of Chemical Sciences, Mahatma Gandhi University, Kottayam, (February 2017-March 2020)
- **Academic Faculty**, School of Chemical Sciences, Mahatma Gandhi University, Kottayam, (1993 onwards)
- **JSPS Post-doctoral Fellow** (Kyushu University, Japan, 1998-2000)
- **Research Associate** (SCTIMST, Thiruvananthapuram, 1992-1993)
- **Short-term Post-doctoral Fellow** (IISc., Bangalore, 1991-1992)

Research Highlights

- **H-index** : **24**
- **i-10 index** : **58**
- **Publications** : **175**
- **Citations** : **2636**
- **Book Edited** : **1**
- **Book Chapters** : **20**

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Awards

- Japan Society for the Promotion of Science (JSPS) Post-doctoral Fellowship, Japan (1998)
- Research group has bagged 11 awards in various conferences

Professional Association & Activities

- **Member**, American Chemical Society
- **Member, Board of Studies**, Central University of Kerala; St. Theresa's College, Ernakulam; CMS College, Kottayam; S.H. College, Thevara (Autonomous Colleges)
- **Member, Board of Studies**, School of Chemical Sciences, M. G. University
- **Reviewer** of various journals published by Royal Society of Chemistry, Wiley, Elsevier, Springer Publishers

Research Supervision

- **Ph. D. Awarded : 35**
- **Research Supervision (Ongoing) : 08**
- **M.Phil. Supervision : 35**
- **M.Sc. Project Supervision : 51**

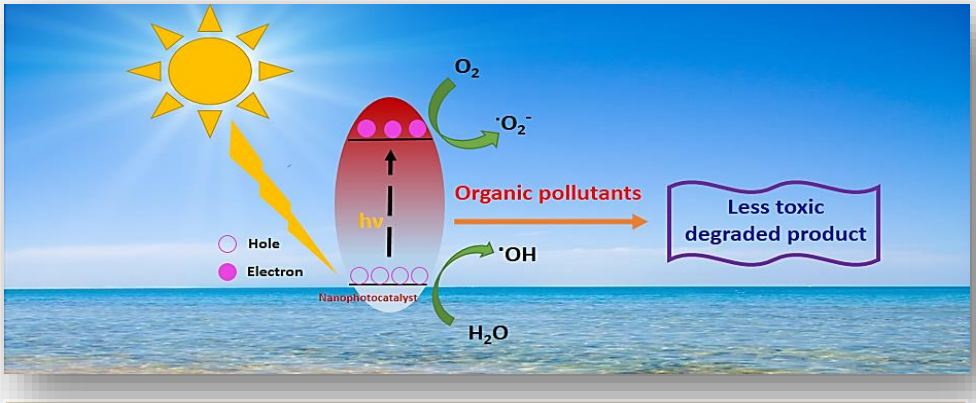
Major Scientific Areas of Interest

- **Self-assembled supramolecular materials**
- **Sensors**
- **Nanomaterial based catalysts**
- **Green chemistry**
- **Computational chemistry**

RESEARCH AREAS

Photocatalysis

Advanced design and fabrication of nanophotocatalysts for wastewater remediation

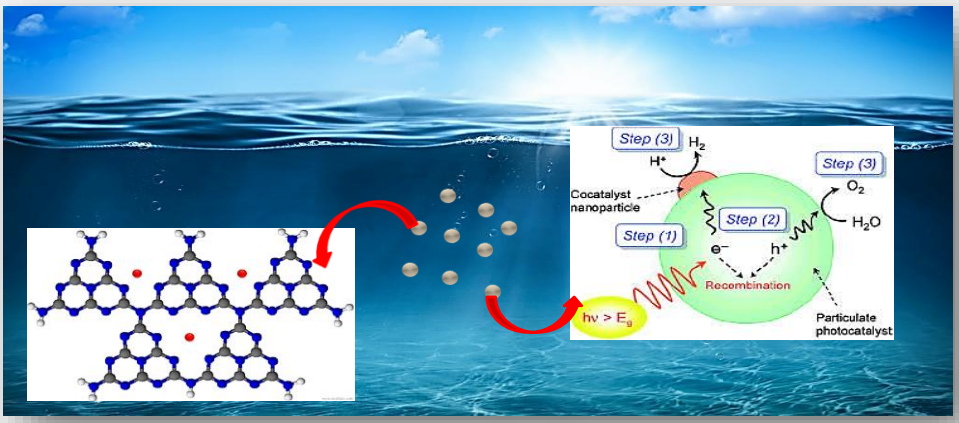


Green Chemistry

Green synthesis of nanoparticles involving microwave, hydrothermal, ultrasound, and green solvents assisted methods

Water Splitting

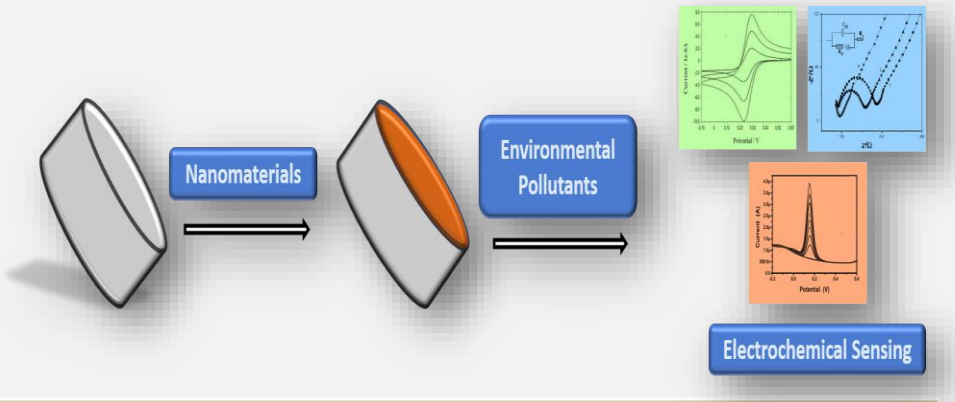
Metal nanoparticles doped on photoactive supports for hydrogen generation through photocatalytic water splitting



RESEARCH AREAS

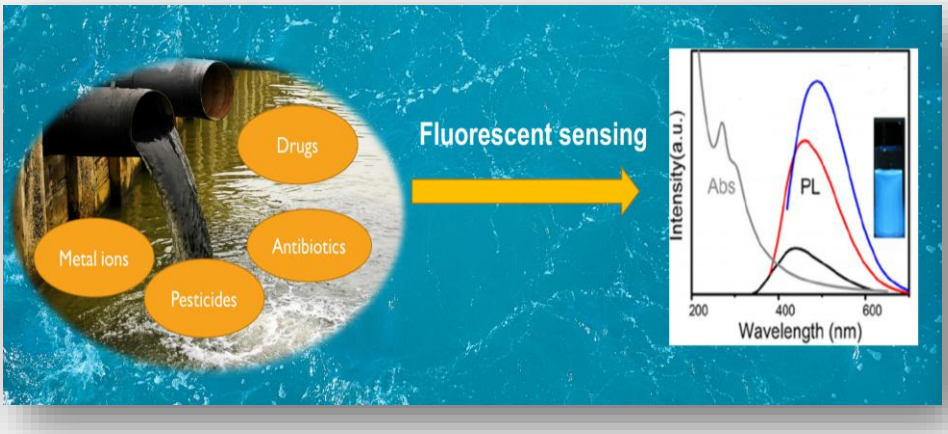
Electrochemical Sensing

Electrochemical detection of environmental pollutants such as metal ions, pesticides, dyes etc., using nanomaterial based catalysts



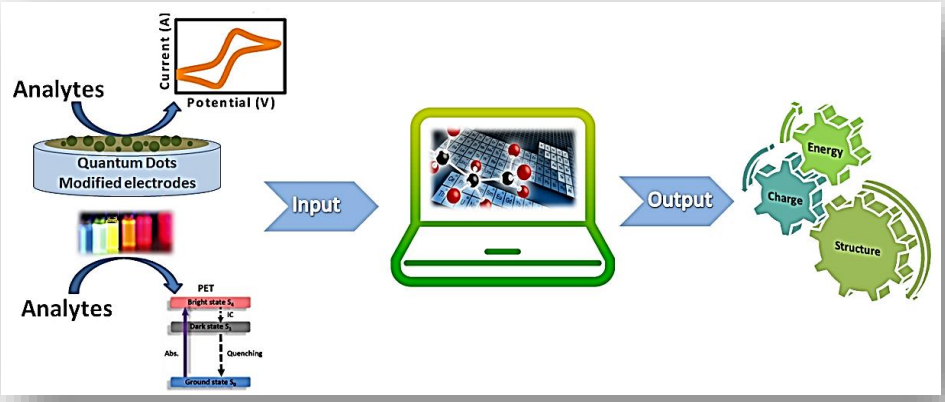
Fluorescence Sensing

Nanomaterials based sensing of metal ions, drugs, antibiotics, pesticides etc.



Computational Studies

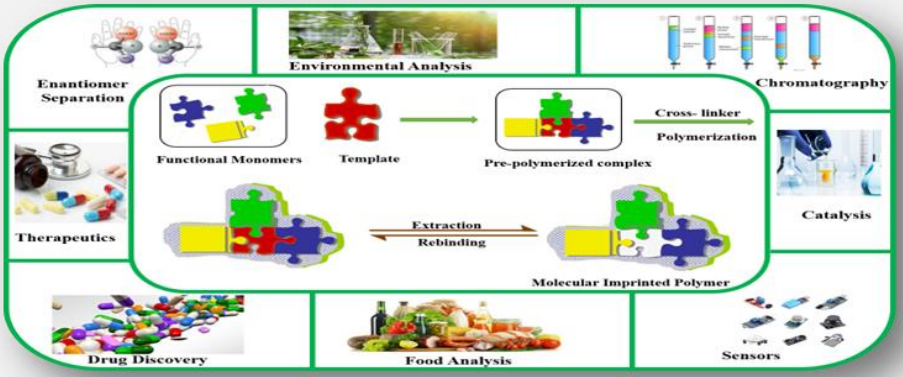
Computational aspects of electrochemical and fluorescence sensing applications of nanomaterials



RESEARCH AREAS

Self-assembled supramolecular materials

Self-assembled supramolecular materials for various applications



RESEARCH GROUP

LATEST PUBLICATIONS

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174. Nitrogen and Sulfur Co-Doped Carbon Quantum Dots for Sensing Applications: A Review, G Somaraj, S Mathew, T Abraham, KG Ambady, C Mohan, B Mathew, ChemistrySelect 7 (19), e202200473 (**2022**)

173. Biomass-derived carbon dots as a sensitive and selective dual detection platform for fluoroquinolones and tetracyclines, B. K Korah, AR Chacko, S Mathew, BK John, T Abraham, B Mathew, Analytical and Bioanalytical Chemistry, 1-17(**2022**)

172. Antibacterial, Cytotoxic, and Catalytic Potential of Aqueous Amaranthus tricolor-Mediated Green Gold Nanoparticles, MS Punnoose, S Joseph, BK John, AR Chacko, S Mathew, B Mathew, Plasmonics, 1-16 (**2022**)

171. *Curcuma amada* derived nitrogen-doped carbon dots as a dual sensor for teracycline and mercury ions, Diamond & Related Materials, 125, 108980 (**2022**)

170. A review on carbon quantum dot based semiconductor photocatalysts for the abatement of refractory pollutants, Athulya M, Bony K John, Anu Rose Chacko, Chitra Mohan, Beena Mathew, ChemPhysChem (**2022**), https://doi.org/10.1002/cphc.202100873

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169. Rational design of Ag_2CO_3-loaded SGO heterostructure with enhanced photocatalytic abatement of organic pollutants under visible light irradiation, N. John, RN Priyanka, MS Punnoose, BK John and B. Mathew, Environmental Science and Pollution Research, 1-13(**2022**)

168. Polystyrene-supported bromoderivative of 2-pyrrolidone: synthesis, characterization and application in microwave-assisted bromination reactions, A Mathew, B Mathew, EP Koshy, Polymer Bulletin 79 , 905-920 (**2022**)

167. A Review on Characterization Techniques for Carbon Quantum Dots and Their Applications in Agrochemical Residue Detection, Bony K. John, Thomas Abraham and Beena Mathew, Journal of Fluorescence, 1-23 (**2022**) DOI : 10.1007/s10895- 021-02852-8

166. Recent Progress and Future Perspectives of Carbon Dots in the Detection, Degradation, and Enhancement of Drugs, Binila K Korah, Anu Rose Chacko, Thomas Abraham, Beena Mathew, Particle & Particle Systems Characterization, 2100264 (**2022**) https://doi.org/10.1002/ppsc.202100264

165. Novel La(OH)3 integrated sGO-Ag3PO4/Ag Hybrid photocatalyst for sunlight driven ultra-fast degradation of industrial and agricultural pollutants, RN Priyanka, T Abraham, NJ Plathanam, S Joseph, B George, B Mathew, Materials Science in Semiconductor Processing 138, 106274 (**2022**)

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163. Advanced Green Approaches for Metal and Metal Oxide Nanoparticles Synthesis and Their Environmental Applications, GM Nair, T Sajini, B Mathew, Talanta Open, 100080(**2022**)

162. Metal-Doped Titanium Dioxide for Environmental Remediation, Hydrogen Evolution and Sensing: A Review, Sneha Mathew, Bony K. John, Thomas Abraham, and Beena Mathew, ChemistrySelect, 6 (45), 12742-12751 (**2022**)

161. A brief overview of molecularly imprinted polymers: Highlighting computational design, nano and photo-responsive imprinting, T Sajini, B Mathew, Talanta Open 4, 100072(**2022**)

160. Microwave assisted green synthesis of gold nanoparticles for catalytic degradation of environmental pollutants, MS Punnoose, D Bijimol, B Mathew, Environmental Nanotechnology, Monitoring & Management 16, 100525(**2021**)

159. Microwave-assisted oxidative coupling of thiols using Polystyrene supported Bromoderivatives of 2-Oxazolidone, Anjaly Mathew, Beena Mathew and Ebey P. Koshy, Polymer and Polymer Composites, 29 (9_suppl), S1351-S1360(**2021**)

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156. Fabrication of La2O3/Bi2O3/silver orthophosphate Heterojunction Catalyst for the Visible Light Mediated Remediation of Refractory Pollutants, T Abraham, RN Priyanka, S Joseph, AR Chacko, B Mathew, Materials Research Bulletin 140, 111299(**2021**)

155. A comparative study on the synthesis, characterization, and antioxidant activity of green and chemically synthesized silver nanoparticles, E Sreelekha, B George, A Shyam, N Sajina, B Mathew, BioNanoScience 11 (2), 489-496(**2021**)

154. Unmodified Green Silver Nanoparticles as Multisensor for Zn2+ and Catalyst for Environmental Remediation, MS Punnoose, B Mathew, ChemistrySelect 6 (15), 3584-3596(**2021**)

153. Fast and efficient degradation of water pollutant dyes and fungicide by novel sulfur doped graphene oxide-modified Ag3PO4 nanocomposite, RN Priyanka, T Abraham, S Joseph, JM George, NJ Plathanam, ..., Environmental Science and Pollution Research 28 (16), 20247-20260(**2021**)

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152. Cyclodextrin-mediated gold nanoparticles as multisensing probe for the selective detection of hydroxychloroquine drug, JM George, B Mathew, Korean Journal of Chemical Engineering 38 (3), 624-634(**2021**)

151. Silver phosphate-based flower-like MoS2/BiFeO3 nanocomposite with enhanced activity for the detection of tetracycline, T Abraham, B Mathew, Materials Chemistry and Physics 260, 124103(**2021**)

150. Polystyrene-supported bromoderivative of 2-pyrrolidone: Synthesis, characterization and application in microwave-assisted bromination reactions, Anjaly Mathew, Beena Mathew and Ebey P. Koshy, Polymer Bulletin (**2021**) 10.1007/s00289-021-03540-0.

149. Microwave assisted green synthesis of silver nanoparticles for optical, catalytic, biological and electrochemical applications, VN Anjana, M Joseph, S Francis, A Joseph, EP Koshy, B Mathew, Artificial Cells, Nanomedicine, and Biotechnology 49 (1), 438-449(**2021**)

148. Flower-like MoS2/BiFeO3 doped silver orthophosphate catalyst for visible-light, assisted treatment of refractory organic pollutants, Abraham, RN Priyanka, S Joseph, NJ Plathanam, MG Gigimol, ..., Applied Materials Today 21, 100845(**2020**)

147. In-situ Fabrication of Ag3PO4 Based Binary Composite for the Efficient Electrochemical Sensing of Tetracycline, T Abraham, MG Gigimol, RN Priyanka, MS Punnoose, Binila K Korah, Beena Mathew, Materials Letters, 279, 128502 (**2020**)

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146. A novel lanthanum and bismuth based self-cleaning nanocomposite for organic pollutants, T Abraham, S Kannan, RN Priyanka, S Joseph, MS Punnoose, ... AIP Conference Proceedings 2269 (1), 030004(**2020**)

145. Optimization of the properties of Mn doped ZnS quantum dots capped with thiourea, D Bijimol, MS Punnoose, BK Korah, B Mathew, AIP Conference Proceedings 2269 (1), 030002(**2020**)

144. Synthesis, characterization and catalytic activity of gold nanoparticles synthesized using a green route, MS Punnoose, D Bijimol, T Abraham, NJ Plathanam, B Mathew AIP Conference Proceedings 2269 (1), 030003(**2020**)

143. Green-synthesized Cu2O nanoaggregates incorporated on beta-cyclodextrin for catalytic reduction and electrochemical sensing, JM George, B Mathew, Journal of the Iranian Chemical Society, 17, 2613-2626 (**2020**)

142. Fabrication of a Greener TiO2@Gum Arabic-Carbon Paste Electrode for the Electrochemical Detection of Pb2+ Ions in Plastic Toys, SK Sivan, SS Shankar, A KandambathPadinjareveetil, R Pilankatta, ..., ACS omega 5 (39), 25390- 25399(**2020**)

141. Polystyrene supported bromoderivative of 2-oxazolidone–an efficient reagent for microwave assisted bromination reactions, A Mathew, B Mathew, EP Koshy, Journal of Polymer Research, 27, 1-8(**2020**)

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140. Polymer supported bromoderivatives of 2-pyrrolidone: An efficient reagent for the microwave assisted conversion of trans-cinnamic acid to trans-β-bromostyrene, A Mathew, B Mathew, EP Koshy, SN Applied Sciences 2, 1-9 (**2020**)

139. Bimetallic Ag-Au nanoparticles as pH dependent dual sensing probe for Mn (II) ion and ciprofloxacin, JM George, RN Priyanka, B Mathew, Microchemical Journal, 155, 104686 (**2020**)

138. Nano layered ion imprinted polymer based electrochemical sensor and sorbent for Mn (II) ions from real samples, A Aravind, B Mathew, Journal of Macromolecular Science, Part A 57 (4), 256-265 (**2020**)

137. Unmodified silver nanoparticles for dual detection of dithiocarbamate fungicide and rapid degradation of water pollutants, PN Ragam, B Mathew, International Journal of Environmental Science and Technology 17 (3), 1739-1752 (**2020**)

136. Magnetic Fe3O4-reduced graphene oxide composite decorated with Ag nanoparticles as electrochemical sensor and self-cleaning material for organic pollutants, Thomas Abraham, K. R. Rejil, Jaise Mariya George, Arun Antony, Suresh C. Pillai, · Steven J. Hinder , Beena Mathew, Journal of Porous Materials, 27 (1), 303-318 (**2020**)

135. Rapid sunlight-driven mineralisation of dyes and fungicide in water by novel sulphur-doped graphene oxide/Ag3VO4 nanocomposite, RN Priyanka, S Joseph, T Abraham, NJ Plathanam, B Mathew, Environmental Science Research, 1-15 (**2020**)

LATEST PUBLICATIONS

134. Adsorptive Removal of Anionic Azo Dye Acid Black 194 from Aqueous Solution using NNMBA-Crosslinked Poly N-Vinyl Pyrrolidone Hydrogel, RL Jose, MG Gigimol, B Mathew, Asian Journal of Chemistry 32 (2), 311-316 (**2020**)

133. Novel La(OH)3 Integrated sGO-Ag3VO4/Ag Nanocomposite as a Heterogeneous Photocatalyst for Fast Degradation of Agricultural and Industrial Pollutants, Ragam N. Priyanka, Subi Joseph, Thomas Abraham, Neena J. Plathanam and Beena Mathew, Catalysis Science & Technology (**2020**) https://doi.org/10.1039/D0CY00104J

132. CuNPs decorated molecular imprinted polymer on MWCNT for the electrochemical detection of L-DOPA,M.P. Sooraj, A. S. Nair, Suresh C. Pillai, Steven J. Hinder, Beena Mathew, Arabian Journal of Chemistry, (**2020**), https://doi.org/10.1016/j.arabjc.2018.06.002

131. Facile synthesis of silver nanoparticles using Azolla caroliniana, their cytotoxicity, catalytic, optical and antibacterial activity, VN Anjana, EP Koshy, B Mathew, Materials Today: Proceedings, 25,163-168(**2020**)

130. Green synthesis of hierarchically porous Cu-and Zn-MOFs by the combined action of hydroxy double salt and surfactant: An ultrafast method, S John, B Mathew, EP Koshy, C George, Materials Today: Proceedings, 25, 23-235 (**2020**)

LATEST PUBLICATIONS

129. Computational Design and Fabrication of Enantioselective Recognition Sorbents for L-phenylalanine Benzyl Ester on Multiwalled Carbon Nanotubes Using Molecular Imprinting Technology, T. Sajini, Renjith Thomas and Beena Mathew, Chinese Journal of Polymer Science, 37, 1305-1318 (**2019**)

128. S-rGO modified sulphur doped carbon nitride with mixed-dimensional hierarchical nanostructures of silver vanadate for the enhanced photocatalytic degradation of pollutants in divergent fields, Applied Surface Science, S Joseph, S Abraham, T Abraham, RN Priyanka, B Mathew, Applied Surface Science 495, 143478 (**2019**)

127. Curcuma longa rhizome extract mediated unmodified silver nanoparticles as multisensing probe for Hg(II) ions, George, Jaise; Mathew, Beena, Material Research Express, 6 1150h5 (**2019**)

126. Tailoring of photo-responsive molecularly imprinted polymers on multiwalled carbon nanotube as an enantioselective sensor and sorbent for L-PABE, Composites Science and Technology, T Sajini, S John, B Mathew, Composites Science and Technology 181, 107676 (**2019**)

125. Green synthesized metal nanoparticles as a selective inhibitor of human osteosarcoma and pathogenic microorganisms, S Francis, KM Nair, N Paul, EP Koshy, B Mathew, Materials Today Chemistry, 13, 128-138 (**2019**)

124. Costusspeciosus rhizome extract mediated synthesis of silver and gold nanoparticles and their biological and catalytic properties, R Vijayan, S Joseph, B Mathew, Inorganic and Nano-Metal Chemistry 49 (8), 249-259 (**2019**)

LATEST PUBLICATIONS

123. Microwave aided and plant reduced gold nanoparticles as talented dye degradation catalysts, S Francis, EP Koshy, B Mathew, Scientia Iranica 26 (3), 1944-1950 (**2019**)

122. Green silver nanoparticles based multi-technique sensor for environmental hazardous Cu (II) ion, M Sebastian, A Aravind, B Mathew, BioNanoScience 9 (2), 373-385 (**2019**)

121. Rational design and synthesis of photo-responsive molecularly imprinted polymers for the enantioselective intake and release of L-phenylalanine benzyl ester on multiwalled carbon nanotubes, T. Sajini, Renjith Thomas, Beena Mathew, Polymer, 173, 127-140 (**2019**)

120. Kinetic and thermodynamic studies of molecularly imprinted polymers for the selective adsorption and specific enantiomeric recognition of D-mandelic acid, T Sajini, M. G. Gigimol, B Mathew, Journal of Polymer Research, 26, 88 (**2019**)

119. Fabrication of structure-specific molecular imprinted polymer-based electrochemical sensor based on CuNP-decorated vinyl-functionalized grapheme for the detection of parathion methyl in vegetable and fruit samples, M. P. Sooraj, Beena Mathew, Food Analytical Methods, 12 (4), 1028-1039 (**2019**) https://doi.org/10.1007/s12161-018-01428-w

118 Unmodified silver nanoparticles based multisensor for Ni(II) ions in real samples,Archana Aravind, Maria Sebastian& Beena Mathew, International Journal of Environmental Analytical Chemistry (GEAC), 99, 380-395(**2019**)

LATEST PUBLICATIONS

117. A brief overview of molecularly imprinted polymers supported on titanium dioxide matrices, T Sajini, MG Gigimol, B Mathew, Materials Today Chemistry, 11, 283- 295(**2019**)

116. Anticancer, antimicrobial, antioxidant, and catalytic activities of green-synthesized silver and gold nanoparticles using Bauhiniapurpurea leaf extract, Remya Vijayan, Siby Joseph, Beena Mathew, Bioprocess and Biosystems Engineering 42 (2), 305- 319 (**2019**) https://doi.org/10.1007/s00449-018-2035-8

115. An electrochemical sensor and sorbent based on mutiwalled carbon nanotube supported ion imprinting technique for Ni (II) ion from electroplating and steel industries, A Aravind, B Mathew, SN Applied Sciences, 1, 23 (**2019**)

114. In-situ S-doped ultrathin gC3N4 nanosheet coupled with mixed-dimensional (3D/1D) nanostructures of silver vanadates for enhanced photocatalytic degradation of organic pollutants, Subi Joseph, Sinoj Abraham, Ragam N. Priyanka, Thomas Abraham, Arya Suresh and Beena Mathew, New Journal of Chemistry, 43, 10618-10630 (**2019**)

113. Catalytic activities of green synthesized silver and gold nanoparticles, Materials Today: Proceedings, Sijo Francis, Keerthi M. Nair, Niya Paul, Ebey P. Koshy, Beena Mathew, Materials Today Chemistry, 9, 97-104 (**2019**)

112. Rational design and tailoring of imprinted polymeric enantioselective sensor layered on multiwalled carbon nanotubes for the chiral recognition of D-mandelic acid, T Sajini, S John, B Mathew, Polymer Chemistry, 10, 5364-5384 (**2019**)

LATEST PUBLICATIONS

111. Tailoring of nanostructured material as an electrochemical sensor and sorbent for toxic Cd (II) ions from various real samples, A Aravind, B Mathew, Journal of Analytical Science and Technology, 9, 22, (**2018**)

110. Electrochemical sensor based on nanostructured ion imprinted polymer for the determination of Cr (III) ion from wastewater of metal plating industry, Aravind, A., Sebastian, M., Aravind, A, Mathew, B., Polym. Int. 67, 1595-1604 (**2018**)

109 Eco-friendly synthesis of silver and gold nanoparticles with enhanced antimicrobial, antioxidant, and catalytic activities, R. Vijayan, S Joseph, B Mathew, IET nanobiotechnology, 12 (6), 850-856(**2018**)

108. Applications of polystyrene supported bromoderivatives of 2-pyrrolidone in microwave assisted organic synthesis, Anjaly Mathew, Beena Mathew, Ebey P Koshy, Indian J. Sci. Res, 18, 79-84 (**2018**)

107. Augmented antimicrobial, antioxidant and catalytic activities of green synthesised silver nanoparticles, Vijayan, S Joseph, B Mathew, Materials Research Express, 5 (8), 085022(**2018**)

106. Simple unmodified green silver nanoparticles as fluorescent sensor for Hg (II) ions M Sebastian, A Aravind, B Mathew, Materials Research Express, 5 (8), 085015(**2018**)

105. Green synthesis of Stereospermumsuaveolens capped silver and gold nanoparticles and assessment of their innate antioxidant, antimicrobial and antiproliferative activities, Bioprocess and Biosystems Engineering, S Francis, EP Koshy, B Mathew, Bioprocess and Biosystems Engineering, 41 (7), 939-951 (**2018**)

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104. Metal oxide nanoparticles in electrochemical sensing and biosensing: A review, JM George, A Antony, B Mathew, Microchimica Acta, 185 (7), 1-26(**2018**)

103. Green silver-nanoparticle-based dual sensor for toxic Hg (II) ions, M Sebastian, A Aravind, B Mathew, Nanotechnology 29 (35), 355502 (**2018**)

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101. Multiwalled Carbon Nanotube Based Ion Imprinted Polymer as Sensor and Sorbent for Environmental Hazardous Cobalt Ion, Mariya Sebastian and Beena Mathew, J. Macromol. Sci. Pure Appl. Chem., 55, 455 (**2018**)

100. Microwave assisted green synthesis of silver nanoparticles using leaf extract of elephantopusscaber and its environmental and biological applications, S Francis, S Joseph, EP Koshy, B Mathew, Artificial cells, nanomedicine, and biotechnology 46 (4), 795-804(**2018**)

99. Indigofera tinctoria leaf extract mediated green synthesis of silver and gold nanoparticles and assessment of their anticancer, antimicrobial, antioxidant and catalytic properties, Remya Vijayan, Siby Joseph and Beena Mathew, Artif Cells NanomedBiotechnol., 46, 861-871(**2018**), http://dx.doi.org/10.1080/21691401.2017. 1345930

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98. Green synthesis of silver nanoparticles using Nervaliazeylanica leaf extract and evaluation of their antioxidant, catalytic, and antimicrobial potentials, R Vijayan, S Joseph, B Mathew, Particulate Science and Technology,37, 809-819(**2018**)

97. Microwave Assisted Green Synthesis and Characterizations of Noble Metal Nanoparticles and their roles as Catalysts in Organic reduction Reactions and Anticancer agent, Francis, Sijo; Koshy, Ebey; Mathew, Beena, Materials Research Express, 5, 045032 (**2018**)

96. Ion imprinting approach for the fabrication of an electrochemical sensor and sorbent for lead ions in real samples using modified multiwalled carbon nanotubes, M Sebastian, B Mathew, Journal of materials science 53 (5), 3557-3572(**2018**)

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94. Carbon Nanotube Based Ion Imprinted Polymer as Eletcrochemical Sensor and Sorbent for Zn(II) ion from Paint Industry Wastewater, Mariya Sebastian and Beena Mathew, Int J Polym Anal. Ch, 23, 18-28 (**2018**)

93. Treatment of Water Effluents Using Silver Nanoparticles, M. S. Punnoose, B. Mathew, Material Science & Engineering International Journal, 2, 169-166 (**2018**)

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92. Microwave aided synthesis of silver and gold nanoparticles and their antioxidant, antimicrobial and catalytic potentials, Sijo Francis, Ebey P. Koshy, Beena Mathew, Journal of Nanostructures, 8, 55-66(**2018**)

91. Green synthesized unmodified silver nanoparticles as a multi-sensor for Cr (iii) ions, A Aravind, M Sebastian, B Mathew, Environmental Science: Water Research & Technology 4 (10), 1531-1542 (**2018**)

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