

## Debika Devi Thongam

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### Education:

Degree/ Certificate	Institution/ Board	CGPA	Year
Visiting researcher	Department of Materials and Optoelectronic Science, National Sun Yat-sen University, Kaohsiung 80424, Taiwan		Dec 14- present
PhD	School of Energy Science and Engineering, Indian Institute of Technology Guwahati, Assam	NA	(Submitted) Jan 2018-
M.Tech (Nanotechnology)	Vellore Institute of Technology, Tamil Nadu, India	8.83/10	Jun' 2014-May' 2016
Project internship	Indian Institute of Technology Bombay, Maharashtra	NA	Jun' 2015-Jul' 2016
B.Tech (ECE)	Lovely Professional University, Punjab, India	7.79/10	Jun' 2010-May' 2014

### Recent Achievements:

1. Selected for Agripreneurship Orientation Programme (AOP) at RKVY-RAFTAAR Agri-Business Incubator, COF, (CAU-I), Lembucherra, Tripura for the submitted project "Providing technology intervention in traditional handicraft products".

### Undertaking projects as PI:

1. Lotus fiber functionalized with nanoparticles for antibacterial properties, Sanajing Sana Thambal, Manipur, India
2. Antimicrobial Fabric from Banana-fiber, Runway India, Hengna & Maben Private Ltd., Nagaland, India

### Workshop/ Training attended:

1. "**Groundwater Quality Management and Analytical Instrumentation**", Central Ground Water Board (CGWB), Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation, Government of India, Assam, 781035.
2. Taken part in **Japan-Asia Youth Exchange program in Science** (Sakura Exchange Program in Science) for Advanced Global Project-Based Learning Program Academic year 2018 at Shibaura Institute of Technology, Japan, 18<sup>th</sup>-27<sup>th</sup> Nov 2018, targeting "**Industry 4.0**".
3. Project internship, Indian Institute of Technology Bombay, Maharashtra, Jun' 2015-Jul' 2016.

### Publication / International Journal:

1. **Thongam, D. D.** & Chaturvedi, H. *Heterostructure charge transfer dynamics on self-assembled ZnO on electronically different single-walled carbon nanotubes*. Chemosphere 323, 138239 (2023), Citations- 0, IF- 8.943
2. **Thongam, D. D.** & Chaturvedi, H. *Induced defect and ZnO nano-flower formation by N, N, dimethylformamide solvent for natural sunlight responsive floating photocatalytic advanced oxidation*

process. Chemosphere 313, 137600 (2023)

3. **Thongam, D. D.** & Chaturvedi, H. *Functionalization of Pristine, Metallic, and Semiconducting- SWCNTs by ZnO for Efficient Charge Carrier Transfer: Analysis through Critical Coagulation Concentration*. ACS Omega 7, 14784–14796 (2022)
4. **Thongam, D. D.** & Chaturvedi, H. *Advances in nanomaterials for heterogeneous photocatalysis*. Nano Express 2, 012005 (2021)
5. **Thongam, D. D.** & Chaturvedi, H. *Nanomaterials for climate change and water pollution mitigation*. in Water Conservation in the Era of Global Climate Change 277–314 (Elsevier, 2021). doi:10.1016/B978-0-12-820200-5.00005-1
6. **Thongam, D. D.** & Chaturvedi, H. *Effect of biochemical compounds on ZnO nanomaterial preparation using aloe vera and lemon extracts*. Mater. Today Proc. 44, 4299–4304 (2020)
7. **Thongam, D. D.**, Gupta, J. & Sahu, N. K. *Effect of induced defects on the properties of ZnO nanocrystals: surfactant role and spectroscopic analysis*. SN Appl. Sci. 1, 1–14 (2019)
8. **Thongam, D. D.**, Gupta, J., Sahu, N. K. & Bahadur, D. *Investigating the role of different reducing agents, molar ratios, and synthesis medium over the formation of ZnO nanostructures and their photo-catalytic activity*. J. Mater. Sci. 53, 1110–1122 (2018)
9. **Thongam, D. D.**, H. Chaturvedi, “*Understanding Charge Carrier Dynamics in Type I and Type II Heterostructures for photocatalysis: ZnO/TiO<sub>2</sub>, ZnO/Fe<sub>3</sub>O<sub>4</sub>*”, under review (Journal of Physics and Chemistry of Solids)
10. **Thongam, D. D.**, H. Chaturvedi, “*Z-scheme charge transfer dynamics in g-C<sub>3</sub>N<sub>4</sub>/ZnO heterostructure interface and its photocatalytic activity activated by natural sunlight*” (submitted)
11. **Thongam, D. D.**, Chi-Te Liang, Mitch M. C. Chou, Da-Ren Hang, “*Doping and defect engineering in carbon-based electrocatalysts for enhanced electrochemical CO<sub>2</sub> reduction*”, CARBON-D-24-00244 (submitted)
12. **Thongam, D. D.**, H. Chaturvedi, “*Sunlight-responsive PVDF-based polymeric membrane coated with g-C<sub>3</sub>N<sub>4</sub> for photocatalytic degradation of organic pollutants*” (writing process)

#### **International Conference/ Workshop Attended**

1. Paper presented in 1st Forum of Young Researchers on Heterogeneous Catalysis (YOURHETCAT 2022), Szeged, Hungary (in person), “*Fabric Coated with Five Different ZnO Nanoparticles for Efficient Photocatalytic Degradation under Natural Sunlight and UV light*”
2. Took part in (in person), Japan-Asia Youth Exchange program in Science (Sakura Exchange Program in Science) for Advanced Global Project-Based Learning Program Academic year 2018 at Shibaura Institute of Technology, Japan, 18<sup>th</sup>-27<sup>th</sup> Nov 2018, targeting “Industry 4.0”.
3. Paper presented at International Online Conference on Nanomaterials (ICN 12-14 August 2022), International Conference on Frontiers in Engineering, Management and Science (27-28th April 2022, ICFEMS-2022), “*Influence of the precursor functional groups and synthesis methods on the intrinsic and morphological properties of ZnO*”
4. Paper presentation in ACS Spring Meeting 2021, “*Self-assembled ZnO nanomaterials on single-walled carbon nanotube surfaces for heterogeneous catalysis*”. ACS Spring Meeting 2021, <https://doi.org/10.1021/scimeetings.1c00802>
5. Paper presented at the International Conference on Recent Advances and Innovation in Solar Energy (RAiSE 2021), “*Development of Hybrid Type I and Type II Heterostructures for Photocatalytic RhB degradation: ZnO@TiO<sub>2</sub> and ZnO@Fe<sub>3</sub>O<sub>4</sub>*”

6. Paper presented at the International Conference on Advances in Materials Processing & Manufacturing Applications (iCADMA Nov. 5-6, 2020) "Effect of Biochemical Compounds on ZnO Nanomaterial preparation using Aloe Vera and Lemon Extracts"
7. Paper presentation in 6<sup>th</sup> ICANN2019, IIT Guwahati, Dec. 2019, on the topic "Hybrid Nano assemblies of Single-walled carbon nanotubes and ZnO for visible photo/photo-electro catalysis".
8. Paper presentation in "Urban Solid Waste Management: Challenges and Issues", August 2019 at Dimapur Government College on "Photocatalyst ZnO Green synthesis and properties study: from aloevera and lemon extract".
9. Participated in 5<sup>th</sup> National Workshop on NEMS/MEMS & Theranostic Devices, IIT Guwahati, Feb 2019.
10. Paper presentation in ICONSAT-2016 held in IISER Pune on "Role of Reducing Agents: Formation and Photo-catalytic Activity of pristine ZnO Nanostructures".
11. Review Paper presentation in SET conference, VIT Vellore, 2015 on "Synthesis, characterization and properties study of Lanthanides doped phosphors",
12. Paper presentation in SET conference, VIT Vellore, 2014

### **Instruments handled**

Field Emission Scanning Electron Microscope, Field Emission Scanning Electron Microscope with elemental analysis, Optical Microscope, UV-Vis, Photoluminescence spectroscopy, centrifuge machine, Metrohm Autolab: Cyclic Voltammetry, Fourier Transform Infra-Red spectroscopy

### **Research excellence and technical experience**

**Instruments used/handled:** Field Emission Scanning Electron Microscope (FESEM), Optical Microscope, UV-Vis, PL spectroscopy, centrifuge machine, Metrohm Autolab: Cyclic voltammetry, FTIR spectroscopy

**Familiar analyzing instruments:** XRD, Raman spectroscopy, AFM, ESR, Photo-catalysis under UV and Solar light, FTIR, DLS, TGA, EDX, BET, MPMS, FEGTEM, XPS, TRPL, UV, PL spectroscopy, Zeta Potential/ DLS Analyzer, electrospinning

**Computer/Software proficiency:** Origin, Arduino, Avogadro, Blender, Crystbox

### **Leadership quality and public engagement**

1. Volunteering | organizing G20 University connect | 2023 Youth20 India Summit, 2022 | NERC, 2022 | UNICEF program
2. Postgraduate Senator in Student Gymkhana Council, IIT Guwahati, 2021-2022
3. Member of Medical User Group, Academic Group IIT Guwahati, 2021-2022
4. Volunteer for Corona having people on IIT Guwahati campus, IIT Guwahati, 2021-2022
5. Organized invited talks- "Interaction with American Chemical Society", July 2021 | "Introduction to 3D illustration using Blender", IIT Guwahati, Feb-2022
6. Completed Yes!+ course, August 2019
7. Volunteer in "Vigyan Jyoti Programme", IITG, Assam, 2018, Participated in "Ek Bharat Shrestha Bharat" cultural show, IITG, Assam, 2018
8. Participated in IITB Kaleidoscope Fashion show, 2016, Participated in college festival cultural show, 2014
9. Member of the drama club and performed a drama based on "Social influence to daughters", LPUPunjab 2010-2012

### **Language Proficiency**

International English Language Testing System (IELTS) overall score: 6.5 (Test date: 3<sup>rd</sup> Sept 2016)

Other languages: Manipuri, Hindi