Faculty Profile - Department of Applied Physics

Name: **Dr. B. VIDHYA**

Designation: Assistant Professor (AGP 8000)

Office Address: Department of Applied Physics,

School of Science, Arts, Media and Management

E-mail: vidhya@karunya.edu

Area of Specialization: Nanomaterials, thin films, Photovoltaics, Photocatalysis and Electrocatalysis

Professional Experience: (Total Year of Experience)

Title of the Profession	**Employer**	**Duration**
Assistant Professor	Karunya Institute of Technology and Sciences	10 years 8 months

Academic Qualification (List from highest to lowest degree)

Degree	**Board/University**	**Year of passing**	**Class/Grade**	**Subjects**
PhD	CINVESTAV (Mexico)	2010	9.1/10 (Grade)	Doctorate in Science-Specialization in Electrical

				Engineering-Solid state electronics.
MSc	Anna University/ PSG College of Technology	2005	9.05(CGPA)	Materials Science
BSc	Bharathiar university/PSG College of Technology	2003	8.82(CGPA)	Applied Sciences

Subject Taught

Undergraduate	Postgraduate
Engineering Physics	Vacuum and Thin film Technology
Applied Physics	Physics of Nanomaterials
Evolution of Materials	
Thin film technology (elective paper)	
Condensed matter physics	
Materials Science	
Introductory Nanotechnology	
Synthesis of Nanomaterials	

Department Activities contributions

i) IQAC – NAAC, NIRF Coordinator
ii) NBA criteria coordinator
iii) CDC member
iv) Mentor

Non-academic activities contribution

i) Coordinator Nature club unit I
ii) Event coordinator Mindkraft 2017, A national level Techno management fest held at KITS from 23rd to 25th March 2017.

BOS member

i) PSG College of Technology- Applied Science, alumni representative (2018-2021)
ii) Kalaignarkarunanidhi Institute of Technology – Physics (2019)

Foreign Interns hosted

i) Thiana Vale Smilgevicius from Brazil through IAESTE from Jan to April 2017- Project title:" Investigation on the structural and optical properties of Alq3/Metal/Alq3 hybrid sandwich structure for OLED Applications.

Funded Project

1. DST-SERB funded project on "Investigation on Antibacterial Effect of Bismuth Vanadate on Multi-Drug Resistant Staphylococcus aureus Infection" as a **Co-PI** for Rs. 26,31,000. (November 2018- 2021)

Resource Person (10 different national conferences and webinar - only few listed here)

i) Invited speaker for one day National Conference on "Recent Trends and Developments in Green synthesis " on 25th January 2019 held at SNS college of Technology.
ii) Resource person for Faculty Development Programme in the Department of Chemistry on 9th May 2018 at at Karpagam Academy.
iii) Delivered keynote address at National conference on Exploring in New Dimensions and Discoveries in the field of chemistry at Karpagam Academy from 7th to 8th March 2019.

Conference Presentations/certificate courses – abroad

- ✓ **USA**, Arizona state university for a short course in Nanotechnology during the year 2007.
- ✓ **Mexico** for PhD Programme 2007-2010.
  Paper presentation entitled " Studies on photocatalytic activity of Cu3SnS4 and its composite with GO and rGO" in the first international conference on Interdisciplinary Approach in Science and Technology held at **Thailand** during 19th and 20th May 2017.
- ✓ Presented a paper entitled " Effect of solvents on morphology and photocatalytic activity of Cu3SnS4 prepared by solvothermal method" in the 2nd ICIAST conference, held in **Srilanka** during 25th-28th May 2018.
- ✓ Presented a paper entitled "Exploration of the properties of Cu3SnS4 as an active photocatalytst for the degradation of MB and an electrocatalyst for HER" in the third international conference on Interdisciplinary Approach in Science and Technology held at National University of Singapore, **Singapore** during 25th -27th May 2019.

Reviewer- Scopus/WOS indexed journals

1) Journal of Alloys and compounds- Elsevier
2) Journal of Photochemistry and photobiology – Elsevier
3) Journal of Materials science-Materials in Electronics -Springer

Publications (List of papers published in SCI journals, in year wise descending order)

S.No	Author(s)	Title	Name of the Journal	Volume	Page	Year
1	V. Shobin Vijay, Rojin Varghese, A. Sakunthala , S. Rajesh , **B. Vidhya**	Highly crystalline V_2O_5 and V_6O_{13} thin films by PLD and a study on morphology transition of V_2O_5 by post annealing	Vacuum	187	110097	2021
2	Manjula R. Shenoy, Sakunthala Ayyasamy, **Vidhya Bhojan,** Rajesh Swaminathan, Nandhakumar Raju, P. Senthil Kumar, M. Sasikumar, Govindan Kadarkarai, Saravanakumar Tamilarasan, Selvaraju Thangavelu, Suryakanth J, and M. V. Reddy	Visible light sensitive hexagonal boron nitride (hBN) decorated Fe2O3 photocatalyst for the degradation of methylene blue	J. Mater. Sci. Mater. Electron			Jan 2021
3	P. IssacNelson, A. Mohan, R. Rathes	Realization of C-60 whiskers incorporated chalcopyrite	Materials Letters	282	12 86 92	2021

	Kannan , **B. Vidhya,** S. Rajesh	$CuIn_xGa_{1-x}Se_2$ in Cu_2Se/C-60/In_3Se_2/C-60/Ga_2Se_3 multilayer structures				
4	I Sheebha, Vanisree Venugopal, Judy James, V Maheskumar, A Sakunthala, **B Vidhya**	Comparative studies on hierarchical flower like Cu_2XSnS_4 [X= Zn, Ni, Mn & Co] quaternary semiconductor for electrocatalytic and photocatalytic applications	International Journal of Hydrogen Energy	45	8139-8150	2020
5	R Jeba Beula, D Suganthi, A Abiram, **B Vidhya**	Transforming polymorphs of Co-doped TiO_2nanoparticles: an efficient photo-electrode for dye-sensitized solar cells	Applied Nanoscience	10	1173–1181	2020
6	D Godfrey, D Nirmal, L Arivazhagan, R Rathes Kannan, P Issac Nelson, S Rajesh, **B Vidhya,** N Mohankumar	A novel ZnPc nanorod derived piezoelectric nanogenerator for energy harvesting	Physica E: Low-dimensional Systems and Nanostructures	118	113931	2020
7	V Maheskumar, I Sheebha, **B Vidhya**, JP Deebasree, T Selvaraju, S Akash	Enhanced electrocatalytic and photocatalytic activity of ball milled copper tin sulphide by incorporating GO and rGO	Applied Surface Science	484	265-275	2019
8	Rajaitha P. Mary, Shamsa. K, Sheebha I, **Vidhya B,**	Influence of the positioning of the incorporated carbon nanostructures on the	Journal of Nanoscience and Nanotechnology	19	5303-5309	2019

	Maheskumar V, Rajesh S	morphology and photocatalytic activity of microwave synthesized ZnO nanorods				
9	A Pandiyarajan, David John Dmonte, N Bhuvanesh, S Suresh**, B Vidhya**, R Nandhakumar	TiO_2 decorated Graphene as a fluorescent chemosensor for the detection of silver ions	Journal of Nanoscience and Nanotechnology	19	5189-5194	2019
10	V. Maheskumar, T. Selvaraju, **B. Vidhya**	Influence of solvent in solvothermal synthesis of Cu_3SnS_4 : morphology and band gap dependant electrocatalytic hydrogen evolution reaction and photocatalytic dye degradation	Internaional Journal of Hydrogen Energy			2018
11	R.R. Kannan, P.I. Nelson, S. Rajesh, T.P. selvan, A. Mohan, **B. Vidhya**, D. Nirmal, Arivazhagan	Curtailed recombination rate and fast carrier transport in ZnPc/GaAs/ZnPc stacked hybrid structure	Optical Materials	85	287-294	2018
12	V. Maheskumar, P. Gnanaprakasam, T. Selvaraju, **B. Vidhya**	Investigation on the electrocatalytic activity of hierarchical flower like architectured Cu_3SnS_4 for hydrogen evolution reaction	Journal of Electroanalytical Chemistry	826	38-45	2018
13	P.I. Nelson, R. Arthi, R.R. Kannan, T.P. Selvan, E. Ajitha, A.	Influence of heat treatment on the properties of thermally evaporated copper	Materials Letters	223	14–16	2018

	Ashina, **B. Vidhya**	selenide thin films				
14	J.P. Deebasree, V. Maheskumar, **B. Vidhya**	Investigation of the visible light photocatalytic activity of $BiVO_4$ prepared by sol gel method assisted by ultrasonication	Ultrasonic Sonochemistry	45	123–132	2018
15	R.J. Beula, S. Devadason, **B. Vidhya**	Incorporation of indium in TiO_2-based photoanodes for enhancing the photovoltaic conversion efficiency of dye-sensitized solar cells	Applied Nanoscience	8	1389–1397	2018
16	J.P. Deebasree, V. Maheskumar, **B. Vidhya**	Investigation on the structural and optical properties of sonochemically synthesized $BiVO_4$ for photocatalytic degradation of methylene blue	J. Mater. Sci. Mater. Electron.	29	10715–10722.	2018
17	P.I. Nelson, R.R. Kannan, A. Mohan, S. Rajesh, **B. Vidhya**	Impact of sequential annealing on the characteristics of thermally evaporated semiconductor $Cu_2Se/ZnSe/Cu_2Se$ sandwich structure	J. Mater. Sci. Mater. Electron	29	7393–7401	2018
18	R.R. Kannan, A. Mohan, P.I. Nelson, V. Arivazhagan, **B. Vidhya**, S. Rajesh	Effect of strain in PbSe/ZnPc stacked layers prepared by thermal evaporation method	J. Mater. Sci. Mater. Electron.	29	7041–7047	2018
19	V. Maheskumar, **B. Vidhya**	Investigation on the morphology and photocatalytic	J. Photochem. Photobiol. A Chem.	356	521–529	2018

		activity of Cu_3SnS_4 synthesized by ball milling and solvothermal method				
20	V. Maheskumar, P. Gnanaprakasam, T. Selvaraju, **B. Vidhya**	Comparative studies on the electrocatalytic hydrogen evolution property of Cu_2SnS_3 and Cu_4SnS_4 ternary alloys prepared by solvothermal method	International Journal of Hydrogen Energy	43	3967–3975.	2018
21	V. Maheskumar, B. Gururajan, **B. Vidhya**	Investigations on the structural, optical and visible light photocatalytic activity of Cu3SnS4 prepared by mechanical alloying	Journal of Materials science - Materials in Electronics	28	19081–19089	2017
22	**B.Vidhya** and Anni ford	Structural and Optical Properties of Ball-Milled TiO_2 and TiO_2-MWCNT for Photocatalytic Application	Nanoscience and Nanotechnology Letters	5	980-985	2013
23	**B.Vidhya**, S.Velumani and R.Asomoza	Effect of milling time and heat treatment on the composition of $CuIn_{0.75}Ga_{0.25}Se_2$ nanoparticle precursors and films	Journal of nanoparticle research	13	3033-3034	2011
24	**B. Vidhya**, S. Velumani, Jesus A. Arenas-Alatorre, Arturo Morales-	Structural Studies of Mechano-chemically synthesized $CuIn_xGa_{1-x}Se_2$ nanoparticles	Materials Science and Engineering B	174	216-221	2010

	Acevedo, R. Asomoza, J.A. Chavez-Carvayar					

1. Details of patents

S.No	Patent Title	Name of Inventors(s)	Patent No	Award Date	Agnecy/Country	Status
1	Novel Material for Electroadhesive materials products thereof and method of manufacture	Dr.S.Rajesh, Dr.R.Nandhakumar, **Dr.B.Vidhya,** Dr.A.Sakunthala, Dr.Nitin Patel	376404	1/12/2020	Intellectual Property India/ India	Granted

Publication in scopus indexed conference proceedings

S.No	Title	Author's Name	Publisher	Year of Publication
1	Investigation on the structural, optical and electrical properties of ZnO-Y_2O_3 (YZO) thin films prepared by PLD for TCO layer applications	A Youvanidha, **B Vidhya,** P Issac Nelson, R Rathes Kannan, SK Suresh Babu	AIP Publishing LLC	2019
2	Effect of ultrasonication during and after preparation of BiVO4 by chemical coprecipitation technique	JP Deebasree, V Maheskumar, **B Vidhya,** G Balaji	Materials Today Proceedings - Elsevier	2019
3	Pulsed Laser Deposited Molybdenum Oxides (MoO_3& MoO_2) Thin Films for Nanoelectronics Device Application	I Sheebha, **B Vidhya,** S Rajesh	IEEE	2018
4	Preparation, deposition of $Cu(In_{1-x}Ga_x)Se_2$ nanopowder thin films by non-vacuum processes and its characterization	S. Velumani, B. J. Babu, **B. Vidhya**, P. Reyes, A. Angeles and R. Asomoza	IEEE 978-1-4244-9965-6/11/2011	2011
5	Structural, photoluminescence and electrical properties of MW-CBD CdZnS thin films	**B.Vidhya** and S.Velumani	IEEE Catalog Number: CFP10827-ART,	2010
6	Mechano-chemical	**B.Vidhya** and	Mater. Res.	2010

	synthesis, deposition and structural characterization of CIGS	S.Velumani	Soc. Symp. Proc. Vol,-1210	
7	Effect of thickness on the structural, optical and electrical properties of MW-CBD CdZnS thin films	**B Vidhya,** S Velumani	IEEE	2009

- ✓ ***Number of Masters' Projects guided -18***
- ✓ ***Number of M.Phil – Completed-3***

1. Mrs. Delya Peter, M.Phil in Physics, " Studies on the properties of spray deposited kesterite CZTS thin films for solar cell applications"
2. Mr. Ponmudi Selvan, M.Phil in Physics, " Preparation and characterization of Molybdenum trioxide (MoO_3) thin films by pulsed laser deposition"
3. Ms.Yovanidha, M.Phil in Nanoscience and Technology, " Investigation on the structural, optical and electrical

- ✓ **Number of Ph.D – Completed -2; Under progress - 6**

1. Dr. V. Maheskumar, "Active photocatalytic dye degradation and electrochemical hydrogen evolution reaction using copper tin sulphide prepared via top-down and bottom-up approach".
2. Dr. J. P. Deebasree, "Investigation on the properties of ultrasonic assisted preparation of $BiVO_4$ for active photocatalytic dye degradation and biofilm eradication".
3. Dr. R. Jeba Beula, Investigation to enhance the efficiency of TiO_2 based dye-sensitied solar cells". (Co-supervisor)