

RESUME

Dr. K. M. FRENY JOY

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EDUCATIONAL QUALIFICATION:

Ph.D. (Materials Science): Anna University, Chennai, India, **2006.**

Thesis Title : “High Pressure Studies on Aurivillius Oxides, Lead and Mercury Chalcogenides”

M.Sc (Physics) : Madras Christian College, University of Madras, India, **2000**, First Class (**80.78%**)

M.Sc Project : Institute of Mathematical Sciences, Taramani, Chennai – 600 113, India, **2000.**

Title : “Dirac Equations and some of its Properties”.

B.Sc (Physics) : Madras Christian College, University of Madras, India, **1998**, First Class (**80.71%**).

TECHNICAL QUALIFICATION

Typewriting : Both Higher (English & Tamil)

Computer : Basics

RESEARCH EXPERIENCE:

Synthesis of wide band gap semiconductor, LCMO nanoparticles and nanophase materials by chemical method such as sonochemical, sol-gel and conventional combustion techniques was the foregoing research. The characterization of these materials has been carried out using X-ray, Raman, SEM, TEM and FESEM etc.

The following is the summary of the work carried out during the research programme

- High Pressure X-ray Diffraction studies are carried out using Diamond Anvil Cell at Anna University. The High Pressure studies are carried out up to a pressure of 20 GPa. Have good experience in Energy Dispersive X-ray diffraction with high pure germanium detector. The spectrum is analysed by using the Multi-Channel Analyser.

- The II – IV semiconductor nanoparticle have been prepared by microwave heating polyvoyl method. The Oxide nanoparticle has been prepared by mechanochemical method and Sol – Gel method and characterized.
- The Electrical resistivity studies at high pressure and high temperature was carried out for oxide nanoparticles and II – IV semiconductor nanoparticles such as PbS, PbSe, HgS, HgSe, HgO upto a pressure of 80kbar and upto a temperature of 300°C.
- The High-Pressure X-ray Diffraction has been carried out by using EDXRD and Diamond Anvil Cell upto a pressure of 18 GPa.
- The phase stability of nanoparticles at high pressure was studied and it was inferred that the transition pressure of the materials are enhanced by the application of pressure compared to that of the bulk. The volume collapse and the surface to volume ratio plays a vital role in the stability and enhancement of the transition pressure.
- Green synthesis of metal nanoparticles are carried out and their antimicrobial activities are studied. Proposed to study its anticancer activities. Synthesis of activated carbon from bio degradable waste using hydrothermal method as effective electrodes for supercapacitors is carried out. The activated carbon thus prepared is able to give higher efficiency at normal temperature. If the temperature is raised better results are expected. Non- linear optical properties of Glycine KI - doped Calcium Chloride prepared by slow evaporation method are analyzed.
- Assessment of Trace elements in soil near the coastal areas of Tamil Nadu, regions near IGCAR, Kalpakkam are carried out and planning to extend the analysis of the toxic trace elements in water bodies and ecofriendly techniques for removing those elements from the drinking and fresh water bodies.

AWARDS & SCHOLARSHIPS:

1. General Amjud Prize in IInd year B.Sc.
2. P. Subramanian Memorial Prize in IIIrd year B.Sc.
3. Aphalat Scholarship from Institute of Mathematical Sciences, Taramani, Chennai 600 113.
4. St. Theresa's Gold Medal awarded for the research contribution in the year 2012 – 2014.

5. Best Research Scientist Finalist of the year 2018 in South Indian ASDF Awards (SIAA – 2018).
6. “International Innovative Scientist in High Pressure Studies on Nanomaterials”, Research Leadership Award of the Year 2020, RULA Awards 2020 in association with United Medical Council.
7. Internal Remarkable Researcher Award for the year 2020- 2021, ISSN Awards in association with Research Bureau Veritas.

RESEARCH PUBLICATION:

➤ International & National Journal

1. “Assessment of trace elements in random selective soil samples from cesspool formations during rainy season by SEM with EDX analysis”, J. Subashini, K.M. Freney Joy, P. Eswaran, R. Ravisankar, Materials Today- Proceedings, Vol. 33, Part 7, 2020, Pg 4340 – 4343, 2020. *doi.org/10.1016/j.matpr.2020.07.458*
2. "Magnetic Susceptibility as Proxy for Heavy Metal Pollution Detection in Sediment", E. Devanesan, A. Chandrasekaran, S. Sivakumar, K. M. Freney Joy, Laith Ahmed Najam, R. Ravisankar, Iranian Journal of Science and Technology, Transactions A: Science, Vol.44, No. 3, Pg. 875 -888. 2020. *doi 10.1007/s40995-020-00865-9*
3. “Pressure induced Structural Stabilization of Bismuth Vanadium Oxides Nanocrystals”. **K. M. Freney Joy** and C. Manjula, Middle East Jour of Sci. Res., Vol 25, No. 4 , pp 887 – 890, June 2017. *doi:10.5829/idosi.mejsr.2017.887.890*
4. “In – situ High Pressure Studies on Nanocrystalline Mercury Sulphide”, **K.M. Freney Joy** and N. Victor Jaya, J. Phys. Sci and Appln, Vol 6, No. 4 , pp 66 – 70, Nov 2016. *doi:10.17265/2159-5348/2016.04.008.*
5. "Electrical Resistivity on Nano HgS under high Pressure and Temperature", **K.M. Freney Joy** and N. Victor Jaya, J. Chem and Para Science, Vol 9, Issue 4, pp2387 – 2390, Oct 2016.
6. “Structural Transformation of Nano- Mercury Oxide under High Pressure”, **K.M. Freney Joy** and N. Victor Jaya, Journal of Mines, Metals and Fuels Vol. 1, pp.470 - 472 (2015).
7. “Resistivity Measurement of Nanocrystalline Lead Selenide Under High Pressure”, **K.M. Freney Joy** and N. Victor Jaya, Proc Indian Natn Sci Acad Vol. 79 No. 3 pp. 391-393, (2013).

8. “Structural Transformation in PbS and HgS Nanocrystals under High Pressure”, **K.M. Freney Joy**, N. Victor Jaya and Jun – Jie – Zhu, Mod. Phys. Lett, B 20, 963 (2006). doi.org/10.1142/S0217984906010925.
9. “Synthesis and High Pressure Electrical Resistivity studies of Ti₃Al”, R. Selva Vennila, Elamurugu Porchelvi, **K.M. Freney Joy**, T.K. Jaya Arun and N. Victor Jaya, Jour of Alloys and Compounds, 392, 24-26, (2005). [doi:10.1016/j.jallcom.2004.09.004](https://doi.org/10.1016/j.jallcom.2004.09.004).
10. “Pressure-induced crystallization in nano-arivillius oxides”, **K.M. Freney Joy**, N. Victor Jaya, and A.Castro, Physica E, 28, 1, 83-87 (2005). [doi:10.1016/j.physe.2005.02.003](https://doi.org/10.1016/j.physe.2005.02.003).
11. “High Pressure and high temperature phase transition in nanocrystalline Aurivillius oxide”, **K.M. Freney Joy**, T.K. Jaya Arun, N. Victor Jaya and A. Castro, Physica E, 23, 188-192, (2004). [doi:10.1016/j.physe.2004.03.018](https://doi.org/10.1016/j.physe.2004.03.018)

➤ **Conference Proceedings**

1. “Structural Behaviour of Mercury Chalcogenides under High Pressure”. **K.M.Freney Joy** and N. Victor Jaya, 27th Advanced Materials Congress (27th AMC), 11th – 14th August, 2019, Stockholam, Sweden.
2. “Crystal Growth and Characterization of Glycine Potassium Iodide (GPI) for Nonlinear Optical Applications”, R. Ravisankar, D. Rajendiran, R. Vijayakumar, P. Jayaprakash and **K.M. Freney Joy**, International Symposium on Modeling of Crystal Growth Processes and Devices, 26-28 February, 2019.
3. “Investigations on Growth and Characterization of Glycine Potassium iodide doped Calcium Chloride (GPICC) crystal”, D. Rajendiran, R. Vijayakumar, G. Senthil kumar, **K. M. Freney Joy** and R. Ravisankar, International Conference on Mathematical Methods, Modeling and Stimulation in Chemical Sciences, 6-8 December 2018, SSN College of Engineering, Chennai.
4. “Investigations on Spectroscopic and Optical Studies in Glycine Potassium Iodide doped Calcium Chloride”, D. Rajendiran, R. Vijayakumar, G. Senthil kumar, **K. M. Freney Joy** and R. Ravisankar, International Conference on Molecular Structure of Nano and Bio Materials, 27&28th September 2018, Thiruvanamalai.
5. “Self – Assisted Energy for portable Nano Robots using Dye Sensitive Solar Cells”, **K.M. Freney Joy** and N. Victor Jaya, 4th ICONSET 2018, 23-24th March 2018.
6. “Transformation of Environmentally Threatening Tree species Prosopis Juliflora into Activated Carbon as Excellent Electrodes for Supercapacitor” , F. Regan Maria Sundar Raj, N. Victor Jaya and **K.M. Freney Joy** , 4th ICONSET 2018 , 23-24th March 2018.

7. Synthesis, Growth and Characterization of Glycine Potassium Nitrate (GPN) Single Crystal, S. Varalakshmi, **K.M. Freney Joy**, M. Selvapandiyar, S.M. Ravikumar and R. Ravishankar, Int Conference on Advances in Materials Science and Engineering Applications, 2-3 March 2018.
8. Effect of the Templating Cationic Surfactant Assisted with Vanadium Pentoxide on the Synthesis and Structure of V₂O₅ as tailored Electrode materials, F. Regan Maria Sundar Raj, N. Victor Jaya and **K.M. Freney Joy**, National Conference on Processing and Fabrication of Advanced Materials (NCPFAM – 2018), 1-2 March 2018.
9. “Smart and green Nanocoatings on metallic biomaterials”, **K.M. Freney Joy** and M. Merlin, National Seminar on Recent Trends in Nanobiosensors, 22nd – 23rd February 2018.
10. “Measurement of activity concentration and evaluation of Radiological hazards in building materials from Chengam of Triuvannamalai district”, Y. Raghu, G. Elango, **K.M. Freney Joy** and R. Ravisankar, Int. Conference on Recent Advances in Applied Physics (ICRAAP – 2017), 21st – 22nd Sep 2017.
11. “High Pressure Electrical Resistivity Studies on Melt processed ND – 123 based bulk material”, R. Selva Vennila, T.K. Jaya Arun, **K.M. Freney Joy**, N. Victor Jaya, S.R. Ghorbani and O.Rapp, 6th National Conference on High Pressure Science and Technology, Nov 28 -30, (2001).

BOOKS PUBLISHED : Authored 5 BOOKS

1. **ENGINEERING PHYSICS**, M. Mary Jaculine, E. Jessy and **K.M. Freney Joy** (2006), Goodwill Communications Ltd, Chennai.
2. **ENGINEERING PHYSICS – I**, **K.M. Freney Joy**, L. Radhika, I. Monica Chandramalar and M. Inbavalli, 1st Edition (2009) and 2nd Edition (2010), Jaitech Publications, Chennai. *ISBN No 978-93-80624-13-6.*
3. **ENGINEERING PHYSICS – II**, **K.M. Freney Joy**, (2010), Jaitech Publications, Chennai. *ISBN No 978-81-909268-6-7.*
4. **ENGINEERING PHYSICS – I**, **K. M. Freney Joy** and S. Muthukumar, 3rd Edition (2011), Jaitech Publications, Chennai. *ISBN No 978-93-80624-13-6.*
5. **Physics Laboratory**, **K.M. Freney Joy**, (2009), Jaitech Publication, Chennai.

CONFERENCE / SEMINARS / WORKSHOPS ATTENDED AND PRESENTED:

1. 5th National Conference on High Pressure Science and Technology, Mar 1-3, 2000, Anna University, Chennai.
2. 6th National Conference on High Pressure Science and Technology, Nov 28 -30, 2001, NPL, New Delhi.

3. Symposium on “Non Linear Optical Crystals and Modelling in Crystal Growth”, Feb 28th -March 1, 2005, Anna University, Chennai.
4. Seminar on “Physics with Homemade Equipment and Innovative Experiments”, Mar 14 &15, 2005, Anna University, Chennai.
5. Workshop on “Nuclear Energy for National Development and Environmental Sustainability”, July 19 -21, (2007), Loyola College, Chennai.
6. National Conference on “Recent Advances in Materials & Technology”, 6-7 Jan 2012, Sathyabama University, Chennai.
7. National Seminar on “Advanced Materials”, 25th April 2012, Easwari Engineering College, Chennai.
8. Workshop on “Bridging the Gap in the Learning Process between School and College Education”, 13th Oct 2012, Jerusalem College of Engineering, Chennai.
9. Workshop on “R &D Proposals – Approach and Preparation”, 15th Dec 2012, Sathyabama University, Chennai.
10. Workshop on “Effective Strategies to Hone Communication Skills”, 6th March 2013, Jeppiaar Engineering College, Chennai.
11. Workshop on “Materials Characterization Techniques”, 3-4 Jan 2014, SSN College of Engineering, Chennai.
12. Workshop on “Solid Waste Management” 27th June 2014, Jeppiaar Engineering College, Chennai.
13. Seminar on “Effective Research Proposal Writing and Research Methodology”, 10th Oct 2014, Jeppiaar Engineering College, Chennai.
14. International Conference on Science, Technology, Engineering and Management”, 26-27th March 2015, Jeppiaar Engineering College, Chennai.
15. International Conference on Science, Technology, Engineering and Management”, 30th & 31st March 2016, Jeppiaar Engineering College, Chennai
16. National Conference on Advanced Material Science, 22nd July 2015, Jerusalem College of Engineering, Chennai.
17. National level workshop, “An Innovative approach for Engineering Students in developing 21st Century life skills”, 7th Oct 2015, Jeppiaar Engineering College, Chennai.

18. National Seminar on “Recent Advances in Nanoscience and Technology” 6th – 7th October 2016- NANOMEET- 2016 – Anna University, Chennai.
19. National Seminar on “Ceramic Coating”, 13th March 2017, A.C. Tech, Anna University, Chennai.
20. International Conference on “Science, Technology, Engineering and Management”, 30th & 31st March 2017, Jeppiaar Engineering College, Chennai.
21. 5th National Conference on “Hierarchically Structured Materials” (NCHSM 2017), 31st March - 1st April 2017, SRM University, Chennai.
22. One day workshop on “Intellectual Property Rights (IPR) and Patent Search Innovations”, 4th August 2017, Anna University, Centre for Intellectual Property Rights (CIPR) & Jeppiaar Engineering College, Chennai.
23. International Conference on “Recent Advances in Applied Physics” (ICRAAP – 2017), 21st & 22nd September 2017, Annamalai University, Tamil Nadu.
24. National Seminar on “Recent Advances in Nanoscience and Technology”, 29th – 30th November 2017- Nanomeet 2017, Anna University, Chennai.
25. One day National Level Workshop on “How to Reach the Hard to Teach”, 9th January 2018, Jeppiaar Engineering College.
26. 6th National Conference on “Hierarchically Structured Materials” (NCHSM 2017), 16th – 17th February 2018, SRM Institute of Science & Technology, Chennai.
27. Post – Centenary Diamond Jubilee – National Seminar on “Recent Trends in Nanobiosensors”, 22nd – 23rd February 2018, University of Madras, Guindy Campus, Chennai.
28. National Conference on “Processing and Fabrication of Advanced Materials” (NCPFAM – 2018), 1st – 2nd March 2018, SSN College of Engineering, Chennai.
29. Two days Seminar on “Advanced Materials and Engineering Applications” (AMEA – 2018), 5th – 6th March 2018, Jeppiaar Engineering College, Chennai.
30. 4th International Conference on Science Engineering & Technology- Role of Robotics Engineering in Science and Technology” – ICONSET – 2018, 23rd – 24th March 2018, Jeppiaar Engineering College, Chennai.
31. International Conference on Mathematical Methods, Modeling and Stimulation in Chemical Sciences” 6-8 December 2018, SSN College of Engineering, Chennai.

32. International Symposium on Modeling of Crystal Growth Processes and Devices, 26-28 February, 2019, SSN College of Engineering, Chennai.
33. Webinar on 'ICT for Effective Physics Teaching, Learning & Evaluation' held on 18th May 2020 organized by the Department of Physics, Stella Maris College (Autonomous), Chennai,
34. Webinar on "Terahertz spectroscopy: Forbidden gap transforming into an advanced application" 9th June 2020, PG & Research Department of Physics, Holy Cross College (Autonomous), Tiruchirappalli,
35. International Virtual Conference on Advanced Nanomaterials Application (VCAN 2020), 17th - 19th June 2020, Centre for Nanotechnology, Vellore Institute of Technology, Vellore.
36. Webinar on "The exciting story of Exoplanets" , 8th July 2020, Department of Applied Physics, Karunya Institute of Technology and sciences, Coimbatore.
37. International Webinar on " Electric vehicles - The future of Transport" , Department of Physics & Chemistry, St. Joseph's Institute of Technology, Chennai, 8th July 2020.
38. Internal Webinar Series on " Indian Nuclear Power Programme" entitled " Fast Forward to Energy Sustainability: The Indian Fast Breeder Reactor Programme", 22nd June 2021.

TRAINING PROGRAMME ATTENDED:

1. FDP on "Data Analysis by SPSS", 1st – 3rd September 2021, Department of Statics & IQAC, Madras Christian College, Chennai.
2. FDP on "Outcome Based Education: Evaluation of Attainment of Outcomes", 28th & 29th July 2021, IQAC, Madras Christian College, Chennai.
3. Certificate in "Manuscript Writing and Peer Reviewed Publication", (MDP 2021), 15th June - 29th June, Eudoxia Research Centre, India.
4. Short term course in "Journey from Semiconductor Physics to Smart devices to Intelligent Automation", 1st May 2021 to 5th May 2021, NIT, Srinagar in association with Semiconductor Society of India.
5. Five days - Faculty Development Programme on E- Commerce, 29th June 2020 to 3rd July 2020, KPR college of Arts and Science, Coimbatore.
6. Online Faculty Development Programme on "The Use of Virtual Physics Labs" – Creating Next Generation Teachers", 20th – 24th May 2020, Geethanjali College of Engineering and Technology Telangana.

7. 12 weeks course on “Physics of Semiconductors”, 15th August to 20th November 2017, Centre for Development of Technical Education, IIT Kanpur.
8. Two days Faculty Development Program on “Legal and Health Issues for Working Women”, 4th – 5th December 2017, Jeppiaar Engineering College, Chennai.
9. A FDP on “Futuristic Approaches of Nanoscience and Robotics in Science and Technology”, 21st – 27th April 2016, Jeppiaar Engineering College, Chennai.
10. A FDP on “Innovations in Nanoscience and Technology”, 28th Nov 2016 – 5th Dec 2016, Jeppiaar Engineering College, Chennai.
11. A FDP on “Research Methodology and Report Writing”, 10th – 12th August 2016, Jeppiaar Engineering College, Chennai.
12. A FDP on “Advance Technique and Innovative Applications in Biotechnology and Chemical Engineering”, 16th – 22nd July 2016, Jeppiaar Engineering College, Chennai.
13. A Faculty development on “Intervention, Clarifying and Reinforcing the role of the student counselor”, STRIDES, 26th & 27th June 2015, Jeppiaar Engineering College, Chennai.
14. Third Refresher Course on “Materials Preparation & Measurement of Properties”, Academy of Sciences sponsored, 2nd – 17th December 2014, IASc Bangalore.
15. 12hrs Training Module on “Leading as HODs – A Faculty Development Intervention”, 24th & 25th June 2014, STRIDES, Jeppiaar Engineering College, Chennai.
16. Training Programme on “Thin film Coating and Characterization Techniques”, 7th & 8th December, 2012, Sathyabama University, Chennai.
17. XXXVIII Refresher Course on “Experimental Physics”, Academy of Sciences sponsored, 5th – 20th June 2012, B.S. Abdur Rahman University, Chennai.
18. Short term Training Programme on “Processing and Applications of Nano-Structured Materials”, AICTE sponsored, 9th – 14th July 2007, IIT Madras, Chennai.

WORKSHOP / SEMINAR/ SYMPOSIUM/ CONFERENCE / FDP ORGANISED:

1. 3rd National Seminar on “Role of Materials in Today’s Technology”, 5th December 2018, Madras Christian College, Chennai.
2. International Conference on Science, Technology and Engineering”, 23rd & 24th March 2018, Jeppiaar Engineering College, Chennai
3. Two days Seminar on “Emerging Trends in Materials and Technology”, (ETMAT – 2017), 27th & 28th July 2017, Jeppiaar Engineering College, Chennai.

4. Seven days FDP on “Futuristic Approaches of Nanoscience and Robotics in Science and Technology”, 21st – 27th April 2016, Jeppiaar Engineering College, Chennai
5. Seven days FDP on “Innovations in Nanoscience and Technology”, 28th Nov 2016 – 5th Dec 2016, Jeppiaar Engineering College, Chennai.
6. International Conference on Science, Technology, Engineering and Management”, 30th & 31st March 2017, Jeppiaar Engineering College, Chennai
7. A FDP on “Innovations in Nanoscience and Technology”, 28th Nov 2016 – 5th Dec 2016, Jeppiaar Engineering College, Chennai.
8. International Conference on Science, Technology, Engineering and Management”, 30th & 31st March 2016, Jeppiaar Engineering College, Chennai
9. International Conference on “Science Technology Engineering and Management”- ICON STEM 2015, convened as Co – Convener under the theme “Engineering Mech Aerotronics Physics- EMAP 2015”, 26th & 27th March 2015.
10. State level symposium on “Progress of Science in Technology”, JECTECHFEST – 2k15, 20th March 2015.
11. National Workshop on “Materials in Research and Development”, NWMRD – 2014, 28th July 2014.
12. Two day Workshop on “Emerging Trends in Nanotechnology Research” ETNR – 2011, 20th & 21st July 2011.

TEACHING EXPERINCE: 16 Years and 6 Months.

Name of the College	Designation	Joining Date	Relieving Date	Experience		
				Years	Months	Days
MADRAS CHRISTIAN COLLEGE	ASST. PROF	17 TH JUNE 2019	TILL DATE	2	2	-
MADRAS CHRISTIAN COLLEGE	TEMP. ASST. PROF	29 TH JUNE 2018	31 ST MAY 2019		11	
JEPPIAAR ENGG COLLEGE	ASSO. PROF	1 ST JUNE 2011	5 TH MAY 2018	7	11	4
JEPPIAAR ENGG COLLEGE		1 ST JUNE 2010	31 ST MAY 2011	1	-	

	ASST. PROF					
JEPPIAAR ENGG COLLEGE	LECTURER	1ST AUGUST 2005	31ST MAY 2009	3	10	-
RAJALAKSHMI ENGG COLLEGE	GUEST LECTURER	22ND SEPTEMBER 2004	31ST MAY 2005	-	8	9
Total				16	7	13

Other Relevant Information:

- 1. Life time Membership in Indian Society for Technical Education, IIT (D) Campus, New Delhi.**
- 2. Organized Workshops, Seminars and FDP for the Development of Young Researchers.**
- 3. Acted as Session Chair for International Conference.**
- 4. Registered Research Supervisor of Anna University.**

The information provided above is true to my knowledge.

(Dr. K.M. FRENY JOY)