

CURRICULUM VITAE

SANTHOSH JEFERSON J.S

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Job Objective:

Intent to build a career with leading research institution/university/R&D in Company of hi-tech environment with committed & dedicated people, which would help me to explore myself fully and realize my potential. Willing to work as a key player in challenging and creative environment.

Academic Qualifications

Degree	Specialization	University/ Institution	Year of Passing	Class Awarded
Ph.D. Nanoscience and Technology.	Nanoscience and Nanotechnology	Anna University Chennai, Tamilnadu, India	2016-2021	Doctorate Awarded
M.Sc., (5 years Integrated Course)	Nanoscience and Nanotechnology	Karunya University Coimbatore, Tamilnadu, India	2010-2015	First Class
DCA Diploma in Computer Application	MS- Office, C programming, DOS, ACESS, JAVA.	Tamil Nadu Computer Education Training Centre, Cuddalore, Tamilnadu, India	May-2009	A+ (>95%)
CAD/CAM Computer Aided Design/Manufacturing	CAD using CATIA	AU-FRG Institute for CAD/CAM, Anna University, Chennai, Tamilnadu, India	April- 2022	A+ (>95%)

Laboratory Experiences

1. Nano Materials Lab, Karunya University, Coimbatore, Tamilnadu, India. May.2014-15.
2. Nanoscience and Nanotechnology and Materials Lab, Centre for Nanoscience and Technology, Anna University, Tamilnadu, India, Feb.2016 – Dec 2021.

International Journal Publications

1. **Santhosh Jeferson, J.S**, Anand Kumar, S, Ariraam, M & Manthakini, M 2021, 'Role of amines in microstructure tuning for synergistic damping and mechanical properties in epoxy resins', *Progress in Organic. Coatings*, vol. 150 pp. 1–15, **Impact Factor : 5.16**
2. **Santhosh Jeferson, J.S**, Logesh Govind, Ariraman Mathivathanan, Bashaiah Sindam, James Raju K.C , Mandhakini Mohandas 2022, 'Impact of Reduced graphene oxide on microstructure evolution in m-Caproamine/ Imidazole toughened epoxy composites – Synergia of Viscoelastic and microwave absorption properties', *Synthetic Metals* Vol. 286 pp 117035, **Impact Factor : 3.26**
3. **Santhosh Jeferson, J.S**, Logesh Govind, Ariraman Mathivathanan, Mandhakini Mohandas, 'Role of Dual Nanoparticles on Selective Localization and Microstructure Formation in SiC/r-GO Caproamine Toughened Epoxy Composites for Enhanced Microwave Absorption Performance', - *under review*

Ph.D. Thesis:

Title: Role of Nanoparticles in Microstructure Tuning of Toughened Epoxy Matrix - Synergism of Viscoelastic and Microwave Absorption Characteristics.

My Ph.D. work comprises discusses the synthesis of m-caproamine and s-caproamine and a low temperature cured novel Epoxy/Imidazole/Caproamine interpenetrating polymer networks (IPNs) of varying degree of micro phase separation was developed. The cure kinetics of the Epoxy/Imidazole/Caproamine system is discussed in detail with various thermodynamic models. The role of functionality of the caproamines and effect of curing accelerator, imidazole, in microstructure tuning of the epoxy matrix is analysed in detail to attain synergistic mechanical and thermomechanical properties and all the results are explained in depth. And my next work is to discuss the impact of reduced graphene oxide on microstructure evolution in Epoxy/Imidazole/Caproamine epoxy composites and the synergetic viscoelastic and microwave absorption properties.

With better performance in composite 40% of m - Epoxy/Imidazole/Caproamine and with the intension to extend its application for radar absorption, 40% of m - Epoxy/Imidazole/Caproamine was reinforced with r-GO. It was quite interesting to find that the RIP mechanism results in dispersed phases of Epoxy/Imidazole which kept growing with increasing r-GO %.

And for my second work describes, The dispersed phases of Epoxy/Imidazole of served as template for the formation of conductive networks. It was very interesting to find that the selective localization of r-GO occurred in the dispersed Epoxy/Imidazole phase upto r-GO 3 wt.%. However, at higher r-GO (7 wt.%), the phase continuity of m-CA/ER is mitigated resulting in co-continuous networks of ER/MI and m-CA/ER phases. Thus, phenomenal microstructure phase separation in m-CA/ER/MI blends in the vicinity of r-GO and subsequent escalation of absorption and thermomechanical properties defines m-CA/ER/r-GO 3 wt.%. as an excellent microwave absorber. The permittivity resonance from the space charge polarization, dipole polarization, interfacial polarization, and r-GO valence electrons' unique property contribute to electronic polarization. In addition, the hopping mechanism in r-GO increases the conductivity thus resulting in microwave absorption in the composite. Henceforth, unlike results published in literature, dispersed phase r-GO 3 wt.% composite exhibited synergetic damping as well very good absorption characteristics with Reflection Loss (RL) of -51.6 dB in the x-band region of 8.2-12.4 GHz than the co-continuous r-GO 7 wt.% composite structure.

And my third work is to discuss the role of SiC particles on the dispersion behaviour of r-GO in m- CA/ER/ composites for enhanced microwave absorption performance. In order to enhance the thermomechanical properties as well as increase the effective absorption bandwidth, we incorporated SiC into m-CA/ER composite with r-GO 7 wt.% with poor microwave absorption characteristics (RL > -10dB), and meticulously studied the role of a various percentage of SiC nanoparticles on the microwave absorption. It was very interesting to find that there was no change in RL up to 3 wt.% SiC loading and with further loading to 5 and 7 wt.%, drastic change in the absorption value occurred with maximum RL -45 dB in 7 wt.%, composite without trading the viscoelastic properties in. The interesting features of nanophase separation of the polymer networks, selective localization of nanoparticles in the phase-separated domains, and microstructure changes associated with these changes are discussed in this work. That is a remarkable achievement using an insulator polymer matrix

[M.Sc. Thesis:](#)

Title: Graphene oxide Nanocomposites: Synthesis, Characterization and Application in Chemo - Sensing

I had done a project entitled “Graphene oxide Nanocomposites: Synthesis, Characterization and Application in Chemo - Sensing and composites also tested in cation and anion sensing using UV and fluorescent spectra, molecular logic gate using fluorescent switch on – off behavior has also been derived by graphene oxide sensing.

Subjects Specialized in Master and Doctor Courses

1. Advanced Nano Composites
2. Nano Energy Materials
3. Advanced Material Physics
4. Advanced Self Assembly
5. Advanced Materials Science
6. Materials Engineering
7. Nanomaterials Toxicity
8. Nanomaterials and Nano Composites on Thermodynamics
9. Organic Chemistry in Nanoscience
10. Advanced Energy related Nanomaterials
11. Engineering Physical Metallurgy
12. Composite Materials
13. Advanced Polymer Sciences
14. Advanced Nanocomposites Manufacturing

Research Skills

- Synthesis of micro/nano scale graphite, graphene flakes and graphene oxide.
- Filler reinforced Epoxy open and closed two part mould making for ASTM standards.
- Modern Reflux Setup with inert conditioned for Polymerisation Synthesis.
- Fiber Reinforced Composite making via resin infusion, hand layup process.
- FT-IR spectroscopic measurement technique using Bruker Optics System.
- Synthesis of Graphene-Oxide nano particles using modified Hummers method.
- Fabrication of Nanocomposites by Phase Inversion Method
- Wet chemical method preparation of Iron nanoparticles, Clay Nanoparticle, Silica Nanoparticles, ZnO Nano particles, CdS Nano particles.
- Technical skills in other fields such as Cell culture technique, Sterilization, Column chromatography SHIMADZU LC20AD, Gas chromatography SHIMADZU GC210, Metal Casting/Forging (metallurgy), Plasma welder.

Broad areas of Research Interest

- Graphite/Graphene and graphene-oxide nanostructures.
- Fiber Reinforced High - Tensile Composites.
- Next - Gen High Impact Resistance Bismalimide, Cyanate Ester FRP Composites.
- Additive Manufacturing, Reinforced High Performance Thermoplastic Polymer
- M-XENE Synthesis and application in Microwave Absorption.
- Carbon, Kevlar, Glass, Basalt, Fiber Reinforced Composites.
- 2-D materials, Graphene Carbon Fiber, Hexagonal Boron Nitride, g-C₃N₄, Ti₃C₂T_x, Reinforced Polymer Composites.
- Electromagnetic shielding, Microwave absorption, FRP Composites for Aerospace Applications.
- Sustainable Additive Manufacturing.

Hands on experience in instrumentation

- X-ray Diffractometer. Rigaku Miniflex 600, Thermo Fisher Scientific, USA
- Scanning Electron Microscope. (Tescan vega 3), Czech Republic
- Atomic Force Microscope, (Contact, Non-contact) Agilent Tech – PicoSPM-LE
- Differential Scanning Calorimetry, Netzsch 214 polyma
- Universal Testing Machine, Tinius Olsen 50 ST
- Digital Optical Microscope, Zeiss
- Zeta Sizer (Particle size and zeta potential analysis), Malvern, UK.
- UV/Vis Spectrophotometer, PerkinElmer, Singapore.
- FT-IR, Shimadzu prestige20IR spectrometer, Japan.
- 3-D Printer, CUBE, USA.
- PVD -Physical Vapor Deposition, HIND, Bangalore.
- Spray Pyrolysis HOLMARC, India
- Ultra-Centrifuge, Hitachi HIMAC CC40series, Japan.
- Rota evaporator HELDOF, EQITRON.
- UV – SHIMADZU 1800 Spectrophotometer.
- Florescence Jasco FP 8300 Spectrofluorometer.
- Planetary Ball mill, Fritsch Germany.
- Ultrasonic processor, Sonics, USA

List of papers presented in Symposia / Conferences/ International Conferences:

1. **Santhosh Jeferson, J.S**, Ananda Kumar, S, Ariram, M & Mandhakini, M 2016, 'Role of amines in microstructure tuning for synergistic damping Paper Presented on "National seminar on recent advanced in Nanoscience and technology" NANOMEET-2016 conducted on 6-7 October by Centre for Nanoscience and technology', Anna University, Chennai, Tamil Nadu, India.
2. **Santhosh Jeferson, J.S** Participated in "National Workshop and Hands on Training Program" on "Thin Film Solar Cells" conducted on 22-23 September, 2017 by Centre for Nanoscience and Technology, Anna University, Chennai, Tamil Nadu, India.
3. **Santhosh Jeferson, J.S & Mandhakini, M**, Caproamine Preparation and the kinetic study of the composite, Paper Presented on "International Conference on Recent Trends in Applied Science and Technology" ICRAST- 2017 conducted on 8-9 September by Centre for Nanoscience and Technology, Anna University, Tamil Nadu, Chennai, India.
4. **Santhosh Jeferson, J.S & Mandhakini, M**, "Cure kinetics of the Epoxy and m/s Caproamine" poster presented in "2nd International Conference on Advances in New Materials" ICAN – 2018 conducted on 08-09 June, 2018 by Department of Inorganic Chemistry, University of Madras, Guindy Campus, Chennai, Tamil Nadu, India.
5. **Santhosh Jeferson J.S & Mandhakini, M**, "Radar Absorption composite in X-Band Region" in "2nd International Conference on Advances in Chemistry with Specific Reference to Catalysis, sensors, Drug Delivery and Energy Materials" ICACSEM – 2020 conducted on 09-10 January, 2020 by Department of Physical Chemistry, University of Madras, Guindy Campus, Chennai, Tamil Nadu, India.
6. **Santhosh Jeferson, J.S & Mandhakini, M**, "Role of amines in microstructure tuning for Damping Applications" Paper Presented on "Recent Advances in Nanoscience and Technology" NANOMEET -2017 conducted on 29-30 November by Centre for Nanoscience and technology, Anna University, Chennai, India.
7. **Santhosh Jeferson, J.S & Mandhakini, M**, "Cure kinetics of the Epoxy and m/s Caproamine" Paper Presented on "International Workshop on Advanced Functional Nanomaterials – 4th Edition" NANOMEET -2017 conducted on 29-30 November by Centre for Nanoscience and technology, Anna University, Chennai, Tamil Nadu, India.
8. **Santhosh Jeferson J.S & Mandhakini, M**, "Cure kinetics of the Epoxy and m/s Caproamine" Paper Presented on "International Workshop on Advanced Functional Nanomaterials – 4th Edition" NANOMEET -2017 conducted on 29-30 November by Centre for Nanoscience and technology, Anna University, Chennai, Tamil Nadu, India.

9. **Santhosh Jeferson J.S** & Mandhakini, M, “m/s – Caproamine incorporated epoxy blends for Damping Applications” Paper Presented on “New Trends In Chemistry” NTC-2016 conducted on 21-22 October by Department of Chemistry, Annamalai University, Chidambaram, Tamil Nadu, India.
10. **Santhosh Jeferson J.S** & Mandhakini, M, “Role of amines in microstructure tuning for Damping Applications” Poster Presented on “National Seminar on recent Advances in Nanoscience and Technology” NANOMEET -2016 conducted on 6-7 October by Centre for Nanoscience and technology, Anna University, Chennai, Tamil Nadu, India.
11. **Santhosh Jeferson J.S** & Mandhakini, M, “Damping Epoxy Composites in Radar Absorption in X-Band Region” Poster Presented on “Recent Trends in Catalysis” conducted on 28 March 2017 by Department of Chemistry, Anna University, Chennai, Tamil Nadu, India.
12. **Santhosh Jeferson J.S** Participated in “Prof .T.Raju Felicitation Seminar on Chromatic Techniques” conducted on 29 June, 2017 by Department of Analytical Chemistry, University of Madras, Chennai, Tamil Nadu, India.
13. **Santhosh Jeferson J.S** & Mandhakini, M, “Microwave Absorption Studies of Novel Isocyanurates Toughened Epoxy Composites for Stealth application” Poster Presented on “4th International Conference on Nanoscience and Nanotechnology” ICONN -2017 conducted on 09-11 August by Department of Physics and Nanotechnology, SRM University, Chennai, Tamil Nadu, India.
14. **Santhosh Jeferson J.S** Participated in “X-Ray Diffraction Data Analysis” conducted on 21-22 February, 2020 by Department of Humanities and sciences, Rajalakshmi Engineering College, Chennai, Tamil Nadu, India.
15. **Santhosh Jeferson J.S** & Mandhakini, M, “Synthesis and Characterisation of Europium incorporated graphene nanocomposites and its metal ion sensing” Poster Presented on “3th International Conference on New Renaissance in Chemical Research” NCNRCR -2016 conducted on 19 August by Department of Chemistry, SRM University, Chennai, Tamil Nadu, India.
16. **Santhosh Jeferson J.S.** Participated in “Virtual Short Term Training Program” (STTP) on MATLAB conducted on 14-18 September, 2021 by Department of Mechanical Engineering, IQAC-MJV College of Engineering, Bangalore, and Karnataka, India.

Extra-Curricular Activities

- Trekking.
- Gardening, Horticulture, aquarist.
- Electrical, Electronics, Automotive DIY Enthusiast.

Computer Skills:

- Microsoft Office tools.
- Origin 7.5
- Chem Draw
- Xpert high score
- Gwyddion
- Image J
- English type writing Junior Exam (40 words / min).

Ability

- Ability to analyze problems/issues.
- Fast Learner, willing to shoulder challenges and responsibilities.
- Self-motivated to learn new technologies and work hard.
- Good communication skills, and able to work in team.

Languages Known

- Tamil, English (read, write, speak)
- Hindi, Malayalam (little proficiency)

Personal Information

Date of Birth: 09th November 1992

Father's Name: Joseph Stanley .V

Nationality: Indian

Sex / Marital Status: Male / Single

Nationality: Indian

Religion: Christianity

Passport No. / Validity: L6199032 / 26/11/2023

Reference

Prof. Dr. Manthakini Mohandas (Ph.D. Supervisor)

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Dr. M. V. I. Enoch. Ph.D (France)

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Mr J.D Lenin Sam Jaya Singh (chairperson)

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Declaration

I hereby declare that the above mentioned are true to the best of my knowledge.

SANTHOSH JEFERSON J.S