Bharathidasan Thangavel

PhD in Chemical Sciences
Corrosion and Materials Protection Division
CSIR- Central Electrochemical Research Institute
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A self-motivated PhD candidate with proven expertise in surface and coating science. I am especially interested in finding innovative ways to collaborate with researchers from various fields to develop new skills and solve new challenges.

Education

PhD in Chemical Sciences - Feb 2021
Thesis Title: Development of Multifunctional Superhydrophobic surfaces
CSIR- Central Electrochemical Research Institute, Karaikudi, INDIA
Academy of Scientific and Innovative Research (AcSIR), Ghaziabad- 201002, India

Masters in chemistry May 2007 – Apr 2009 **First class - 76.4 %**
Bharathidasan University
Tiruchirappalli, India

Bachelor in chemistry May 2004 – May 2007 **First class - 72.7%.**
Bharathidasan University
Tiruchirappalli, India

Research Experience (9 yrs 7 Months)

CSIR Senior Research Fellow March 2017- April 2020
Corrosion Materials and Protection Division
CSIR - Central Electrochemical Research Institute, Karaikudi, India

Project Assistant, Aug 2013 - March 2017
Corrosion Materials and Protection Division,
CSIR - Central Electrochemical Research Institute Karaikudi, India.

Project: Development of Corrosion Resistant Superhydrophobic Coatings.
Key Responsibilities:

- Chemical modification of conventional epoxy polymers to low surface energy polymers (epoxy- siloxane).
- Surface modification of nanofillers by organosilane treatment by varying hydrophobic chains of silane chemistry.
- 2D Materials fillers for paint formulation (FGO- Improved Hummer Method, BN layered sheets – Combustion method)

- Surface preparation of Metallic substrates (Chemical cleaning, Mechanical Cleaning)
- Formulation of Water Repellent coating. Paint Testing and Evaluation analysis as per ASTM Standard. [Wettability, Corrosion Testing (Electrochemical Impedance Analysis, Accelerated Corrosion Test-Neutral Salt spray Test), Thermal Characterization, Mechanical testing of Polymer nanocomposites (Hardness, Abrasive Wear)]

Project Assistant, April 2010- March 2013.
Surface Engineering Division ,
CSIR- National Aerospace Laboratories, Bangalore, India.

Project 1: Development of Icephobic (anti-icing) coatings.
Key Responsibilities:

- ❖ Surface Preparation of Aluminium Alloy AA 2024 Substrates (Chemical Etching, Surface pre-treatment)
- ❖ Fabrication of superhydrophobic Aluminium alloy surfaces - Self Assembled Monolayer Deposition.
- ❖ Formulation of siloxane resins with different cross-linking silane chemistry.
- ❖ Formulation of Polyurethane, Acrylic, and Top Coat- Silicone paints.
- ❖ Coating Evaluation as per ASTM Standard (Wettability, Hardness, Ice Adhesion – Zero degree cone method)

Project 2. Development and Feasibility studies of sol-gel nanocomposite superhydrophobic coatings.

Key Responsibilities:

- ✓ Coatings formulation with different pendant functional organic groups-sol-gel process.
- ✓ Transparent Sol-gel coatings formulation, nanoroughness tunning by fillers size and concentration.
- ✓ Surface Preparation of Silica and Aluminium Alloy AA2024 Substrates.
- ✓ Evaluation of Sol-gel nanocomposite – Wettability, Hardness (PHT), Cross Hatch Adhesion Test, Corrosion studies, Drag reduction and oleophobic properties.

Publications:

(https://scholar.google.co.in/citations?user=9jgcQ9QAAAAJ&hl=n)

1. Cerium Stearate Electrodeposited Superhydrophobic Coatings for Active Corrosion Protection of Anodized AA 2024-T3
   Abirami S, **Bharathidasan T**, Sathiyanarayanan Sadagopan, Arunchandran Chenan. CORROSION, The Journal of Science and Engineering, 07/2021, 3799. **(IF – 1.927)**
2. Self- replenishing superhydrophobic durable polymeric nanocomposite coatings for heat exchanger channels in thermal management applications.
   T.Bharathidasan, S.Sathiyanaryanan. Progress in Organic Coatings, 2020,148, 105828. **(IF – 5.161)**
3. Anionic surfactant doped synthesis of Poly Aniline Dendritic (PANID) fibers and its anti-corrosion performance.
   T.Siva **T.Bharathidasan**, S.Sathiyanarayanan. Materials Today Communications, 2020, 100812-22. **(IF – 3.383)**
4. Investigations on the Corrosion Barrier Property and Hydrophobicity of a PVB/PDMS based Bi-layer Coating. Conference Proceedings NACE INDIA CORCON 2019, Paper No PP 15.
   S. Abirami, **T. Bharathidasan**, C. Arunchandran, S. Sathiyanarayanan
5. Performance Evaluation of Silane/siloxane Based Penetrating Sealer for Structural Applications in Marine Environment . Conference Proceedings NACE CORCON 2017, Issue RCC13.
   R.Vedalakshmi S.Sathyanarayanan, S.Sreejakumari and **T.Bharathidasan.**
6. Zinc Oxide-Containing Porous Boron–Carbon–Nitrogen Sheets from Glycine–Nitrate Combustion: Synthesis, Self-Cleaning, and Sunlight-Driven Photocatalytic Activity.
   T Bharathidasan, Aditya Mandalam, M Balasubramanian, P Dhandapani, S Sathiyanarayanan, Sundar Mayavan ACS Applied Materials & Interfaces 2015, 33, 18450-18459. **(IF – 9.229)**
7. Above 170^{o} water contact angle and oleophobicity of fluorinated graphene oxide-based transparent polymeric films.
   T Bharathidasan, Tharangattu N Narayanan, S Sathiyanaryanan, SS Sreejakumari , Carbon 2015, 84, 207-213. **(IF – 9.594)**
8. Effect of Anodized Oxide Layer Aging on Wettability of Alkyl Silane Coating Developed on Aerospace Aluminum Alloy G. Yoganandan, **T. Bharathidasan**, M. Soumya Sri, D. Vasumathy, J. N. Balaraju, Bharathibai J Basu. Metallurgical and Materials Transactions A. 2015, 46 (1) 337-346. **(IF – 2.556)**

9. Effect of wettability and surface roughness on ice adhesion strength of hydrophilic, hydrophobic and superhydrophobic surfaces **T.Bharathidasan**, Vijay Kumar, M.S. Bobji, R.P.S. Chakradhar, Bharathibai J. Basu Applied Surface Science 2014, 314, 241-250. **(IF -6.707)**
10. Superhydrophobicity of AA2024 by a simple solution immersion technique R. V. Lakshmi, **T. Bharathidasan**, Bharathibai J. Basu. Surface Innovations 2013 1(4) 241 –247. **(IF 3.016)**
11. Superhydrophobic oleophobic PDMS- silica nanocomposite coating. Bharathibai.J.Basu, **T.Bharathidasan**, C.Anandan. Surface Innovations 2013 1(1), 40-51. **(IF – 3.016)**
12. Studies on the fabrication and characterization of optical sensor coatings for Aerodynamic applications. **T.Bharathidasan**, Bhavana Rikhari, Dijo Prasannan, V DineshKumar, R.P.S. Chakradhar, Bharathibai J Basu. Journal of Applied Sciences 2012, 12(16), 1646-650.
13. Fabrication of Superhydrophobic and Oleophobic sol-gel nanocomposite coating. R.V. Lakshmi, **T. Bharathidasan**, Parthasarathi Bera, Bharathibai J Basu. Surface & Coatings Technology 2012, 206, 3888-3894. **(IF – 4.158)**
14. Superhydrophobic sol-gel nanocomposite coatings with enhanced hardness. R.V.Lakshmi, **T.Bharathidasan**, Bharathibai J Basu. Applied Surface Science. 2011, 257, 10421-10426. **(IF – 6.707)**

Patent

1. Water repellent corrosion-resistant coating and its process thereof. **(Indian Patent No: 375170)**

Seminars/Conferences/Workshops

- Participated and presented a work (Superhydrophobic live demo on Industrial exhibition at International Symposium on Advances in Electrochemical Science & Technology (iSAEST-12)" Chennai during 08-10 January, 2019 organized by SEAST, Karaikudi and CSIR-CECRI, Karaikudi.
- Participated and presented a paper (Oral) 19th National Conference on Corrosion Control 5 – 7 December 2018, Mayfair Convention, Bhubaneswar.
- Participated and presented a paper International Symposium on Advances in Electrochemical Science & Technology (iSAEST-11)" Chennai during December, 2016 organized by SEAST, Karaikudi and CSIR-CECRI, Karaikudi.
- Participated and presented a paper (poster) 18th National Conference on Corrosion Control 24 - 26 Feb., 2016, Hotel Green Park, Chennai.

- Participated and presented a paper (poster) 12th International Symposium on Surface Engineering and Protective Coatings On October, 7, 2015 at EXPO Centre Greater Noida ,organised by Society for Surface Protective Coatings, India.

- Participated and presented a paper (Oral) 17th National Conference on Corrosion Control 21 - 23 August, 2014, CSIR-Central Electrochemical Research Institute, Karaikudi.
- Participated and presented a paper (poster) in International conference on thin films & applications (ICTFA -2012), organised by School of Electrical and Electronics Engineering, SASTRA University, Thanjavur, India.
  Title: Studies on the Fabrication and Characterization of Optical Sensor Coatings for Aerodynamic Applications.
- Paper presented in National conference on Non –Conventional Energy Sources – NESCON 2009 held at Guru Nanak College, Chennai during March 11-13, 2009.

Research Interests

Surface Science, Sol-Gel Coatings, Superhydrophobic Polymer films, Corrosion Control Coatings, Polymer Nano-composites, Shape Memory Polymers, Self Healing Coatings.

Hands-on Proficiency

Scanning Electron Microscope (Carl Zeiss EVO18), BET Surface Area Analyzer (Autosorb iQ_2), Zeta Analyser (ZetasizerNP), Electrochemical Impedance Spectroscopy, FTIR Spectroscopy, UV-Visible Spectroscopy, and Optical Tensiometer - Contact Angle Meter. Paint Testing Analysis as per ASTM Standard (Taber Abrasion, Holiday Detector, Pull off Adhesion, Conical Mandrel Bend Test and Hardness tester indenter).

Awards

- Best Poster Award in 12th International Symposium on Surface Engineering and Protective Coatings On October, 7, 2015 at EXPO Centre Greater Noida, organised by Society for Surface Protective Coatings, India.
- Best Research Display Award exhibits on the occasion of CSIR, Council of Scientific and Industrial Research Foundation day at CSIR-CECRI Karaikudi India.
- Best Poster Award International Conference on Thin Films & Applications (ICTFA-2012), organised by School of Electrical and Electronics Engineering, SASTRA University, Thanjavur, India

Scientific Memberships

- Life member at Asian Polymer Association
- The Society For Surface Protective Coatings - India (SSPC India)
- Society for Advancement of Electrochemical Science and Technology (SAEST)

Linked-In Profile

https://www.linkedin.com/in/bharathidasan-thangavel-a5590851

References

Dr. S. Sathiyanarayanan Chief Scientist Corrosion & Materials Protection Division CSIR-Central Electrochemical Research Institute Karaikudi - 03 Tamil Nadu, India. Phone: (O) 04565 241 522 Mobile: +91-9442215802 E-mail : sathya@cecri.res.in	Dr. M. Sundar Principal Scientist Lead Acid Battery Group, ECPS Division, CSIR-Central Electrochemical Research Institute Karaikudi - 03 Tamil Nadu, India. Phone: (O) 04565 241 423 Mobile : +91-7598446281 E-mail: sundarmayavan@cecri.res.in
Dr.Parathasarathi Bera Principal Scientist Surface Engineering Division CSIR- National Aerospace Laboratories Bangalore-17, India. Mobile : +91-9901135608 E-mail: partho@nal.res.in	Dr R.V.Lakshmi Senior Scientist Surface Engineering Division CSIR-National Aerospace Laboratories Bangalore-17, India. Mobile : +91-9591957000 E-mail:lakshmi_rv@nal.res.in

Declaration

I hereby declare that the above mentioned information is true to my knowledge and belief.

Place: Kallakurichi
Date: 13-12-2021

Signature

(**T. BHARATHIDASAN**)