

Faculty Profile



Dr. S. Premkumar, M.E., Ph.D.

Assistant Professor, Department of Mechanical Engineering

HIGHLIGHTS:

- Number of Journal Publications: **21**
- H-Index: **08**
- Patents Published: **01**
- Patents: 2 Granted, 1 Applied, 1 Foreign Patent Filed
- EDII Funded Research Project: ₹10 Lakhs

PROFESSIONAL LINKS:

- Scopus ID: **58064892900**
- Scopus Link: <https://www.scopus.com/authid/detail.uri?authorId=57222599303>
- Google Scholar ID: <https://scholar.google.com/citations?user=c0g1u00AAAAJ&hl=en>
- Anna University Faculty ID: 1-9600945658
- AICTE Faculty ID: 2768421992

PROFESSIONAL BACKGROUND:

- Teaching Experience till date: 4 years 1 month
- Research / Industrial Experience: Research Scientist / Technical Team Leader, FEROX Fuel Tabs India Pvt. Ltd. (April 2023 – June 2024)

AREA OF SPECIALIZATION:

- Waste-to-Energy and Sustainable Fuels
- Waste Plastic-to-Fuel Conversion

- IC Engine Combustion and Emission Control
- Catalyst Synthesis and SCR After-Treatment
- Green Hydrogen Production and Wastewater-to-Hydrogen Technologies

INTERNATIONAL / RESEARCH EXPOSURE

- Active research collaboration and publications involving international co-authors and institutions.
- Research profile includes sustainable energy, waste-derived fuels, catalyst development, emission mitigation, and green hydrogen systems.

PH.D. DETAILS

- Ph.D. in Thermal Engineering (2019–2024), SRM Institute of Science and Technology, Chennai.
- Thesis: After-treatment techniques to reduce environmental emissions from IC engines.

PATENTS PUBLISHED / GRANTED

- Granted – Biofuel blended alternative fuel for diesel engines for optimized performance (2020).
- Granted – Improving the catalytic converter efficiency through surface area optimization for exhaust emissions (2023).
- Applied – Activated beach sand base mould catalyst used to reduce exhaust emission in stationary diesel engine (2025).
- Foreign Patent Filed – Enhancing SCR efficiency by improving reducing agent concentration through the design of a swirl mixer blade (2024), Politecnico di Torino, Italy.

FUNDED RESEARCH PROJECT

- EDII-Funded Project – Indigenous Algal Sustainergy: Dual Production of Green Hydrogen and Biofuels from *Scenedesmus obliquus*.
- Funding Agency: Entrepreneurship Development and Innovation Institute (EDII), Tamil Nadu.
- Role: Principal Investigator | Funding Amount: ₹10 Lakhs | Year: 2026.
- Focus: Integrated photobioreactor system using *Scenedesmus obliquus* cultivated in MSW wastewater for simultaneous biodiesel and green hydrogen production.

COURSES / TECHNICAL SKILLS

- ANSYS Fluent, COMSOL, Aspen Plus, MATLAB/Simulink.
- Catalyst synthesis and characterization: BET, XRD, SEM, FTIR, TGA.
- Diesel / hydrogen dual-fuel testing, wet scrubbing, emission measurement and engine test-bed operation.

ACHIEVEMENTS

- Principal Investigator of an EDII-funded ₹10 Lakhs project on dual production of green hydrogen and biofuels from *Scenedesmus obliquus*.

JOURNAL PUBLICATIONS

1. **G. Kavitha**, U. Elaiyaran, Premkumar S*, Dhinesh Balasubramanian*, Utku Kale*, Artūras Kilikevičius. "Integrated Zn-MOF synthesis catalyst as Catalytic converter for Ultra-Low Engine Emissions: Multi-Pollutant abatement, Reaction Mechanism and Catalyst Lifetime Reliability." Energy Reports. 2026 [**Impact factor = 4.93**].
2. **S. Premkumar***, N. Anbazhagan, A. Manikandan, T. Arunkumar. "Enhanced NO emission reduction and Lifetime assessment of Cds synthesis catalyst for stationary diesel engine application." Revista Matéria. 2026 [**Impact factor = 1.5**].
3. **S. Premkumar***, Kavitha G, Arunkumar T, Pei-Chien Tsai, Yuan-Chung Lin, Vinoth Kumar Ponnusamy. "Cerium-Based Selective Catalytic Reduction Catalysts for Diesel Exhaust Treatment: Mechanisms, Challenges, and Innovations – A Review." Fuels. 2026 [**Impact factor = 7.8**].
4. **S. Premkumar***, Kavitha G, Arunkumar T, Nantheeswaran Periyappan, Mariappan Mariappan. "Enhanced Emission Reduction Using Low-Temperature Synthesized CaCO₃ Catalyst in Diesel Engines Operating on 50% Diesel–Plastic Oil Blend." Environmental Science and Pollution Research. 2026 [**Impact factor = 5.03**].
5. **S. Premkumar***, Kavitha G, Prabhu. "Utilization of Conch Shell-Derived Calcium-Based Catalyst for Exhaust Emission Control in Diesel Engines." Fuel Processing Technology. 2026 [**Impact factor = 7.7**].
6. **S. Premkumar***, Arunkumar, Panneerselvam. "Performance study of SCR on Fe₂O₃-SiO₂/Al₂O₃ synthesis catalyst for diesel engine emission reduction." Energy Reports. 2026 [**Impact factor = 4.93**].
7. **S. Premkumar***, Kavitha G, Jibitesh Kumar Panda, Rajesh K, Arunkumar T. "Comparative emission analysis of diesel engine integrated with Mn and Ce-Si synthesis catalyst-based

moulds using base fuel and B50 plastic oil." Journal of Energies. 2025 [**Impact factor = 3.2**].

8. **G. Kavitha**, Moganesh Govindhan, S. Premkumar*. "Dye pollution and its implications for human health, aquatic ecosystems, and sustainable wastewater treatment: A comprehensive review." Journal of Water Process Engineering. 2025 [**Impact factor = 6.7**].
9. **G. Kavitha**, A. Manikandan, S. Premkumar*, G. Manikanda Raja, R.L. Krupakaran, Dhinesh Balasubramanian, Van Quy Nguyen, Anh Tuan Hoang, J.S. Femilda Josephin, Sulaiman Ali Alharbi, Edwin Geo Varuvel. "Thermodynamic and emission analysis of waste plastic oil fuelled diesel engine with Ce-Al catalyst-based catalytic converters – An experimental study." Process Safety and Environmental Protection. 2025 [**Impact factor = 6.9**].
10. **Prabhu B**, Arunkumar T, Premkumar Subramanian, Nantheeswaran Periyappan, Abdullah Alarifi, Mariappan Mariappan. "Conch shell derived bio carbon / Paraffin as novel composite phase change material with enhanced thermal energy storage properties for photovoltaic module cooling systems." Solar Energy Materials and Solar Cells. 2024 [**Impact factor = 7.267**].
11. **Premkumar Subramanian**, Rangunath Jeganatha, Kavitha Ganeshan, Sureshkumar Kasinathan, Balaji Subramanian. "Study on the effect of wet scrubbing technique on emissions in a dual fuel engine operating with diesel and hydrogen." Environmental Science and Pollution Research. 2024 [**Impact factor = 5.03**].
12. **S. Premkumar**, G. Balaji. "Influence of Ceria Silica-based synthesized catalyst in a CI Engine Exhaust System Operating with Plastic Oil Blend." Part E: Journal of Process Mechanical Engineering. 2024 [**Impact factor = 2.4**].
13. **Subramanian Premkumar**, Kothalam Radhakrishnan, Ramji Kalidoss, Jothi Vinoth Kumar, Natarajan Abirami, Baskaran Stephen Inbaraj. "Synthesis, Characterization and Application of SnO₂ @ rGO Nanocomposite for Selective Catalytic Reduction of Exhaust Emission in Internal Combustion Engines." Catalysts, 381, 13(2). 2023 [**Impact factor = 4.641**].
14. **S. Premkumar**, G. Balaji. "Evaluation of 4A and 5A zeolite as a catalyst material in a catalytic converter for NO emission reduction in a CI engine." Environmental Science and Pollution Research, 30, 41726–41740. 2023 [**Impact factor = 5.03**].
15. **S. Premkumar**, G. Balaji. "Evaluation of various wet scrubbing solutions for CI engine exhaust." Journal of Physics, 2054, 012023. 2021 [**SNIP = 0.55**].

16. **Dr. A. Manikandan**, Dr. Danni, S. Premkumar, J. Benny John. "Prediction of Mechanical Properties of Natural Fibers Reinforced Polymer Composites." Tierarztliche Praxis. 2021 [Impact factor = 0.388].
17. **S. Premkumar**, G. Balaji. "Study on efficient removal of NO from CI engine exhaust gas by wet scrubbing method using NaOH solution." Materials Science and Engineering, 042028. 2021 [SNIP = 0.543].
18. **Raja Velusamy**, Suresh Babu Annamalai, Mangudi Rangawamy Swaminathan, Hariharan Periyana Pillai, Sakthinathan Ganapathy, Vignesh Radhakrishnan, Premkumar. "Experimental Investigation on the Effect of Natural Based Additives on Single-Cylinder Di Diesel Engine." SAE. 2021 [Impact factor = 0.62].
19. **S. Premkumar**, G. Balaji. "Experimental Investigation of HC and CO Emission Reduction From A Diesel Engine Powered By Plastic Oil Blend Using Fly Ash As Catalyst." Journal of Thermal Analysis and Calorimetry, 147, 1535–1545. 2021 [Impact factor = 4.626].
20. **S. Premkumar**, G. Balaji. "Study of Emission Control On Stationary Diesel Engine By Scrubbing Technique With Sodium Bicarbonate Solution." Earth and Environmental Science, 573, 012005. 2020 [SNIP = 0.514].
21. **S. Premkumar**, G. Balaji. "Exploration of Zeolite 5A as Catalyst In The After Treatment System For A CI Engine Powered By Plastic Oil Blend." Materials Science and Engineering, 912, 042028. 2020 [SNIP = 0.543].