

**CSIR-National Environmental Engineering Research  
Institute (CSIR-NEERI)**



**Dr. G. SARAVANAN**

Principal Scientist

Chemistry Department,  
CSIR-NEERI,  
Chennai Zonal Centre,  
CSIR Madras Complex,  
Taramani 600113  
Chennai, Tamilnadu.

Scientist-In-Charge,  
RACE Facility,  
Sivakasi 626 005  
Tamilnadu

[g\\_saravanan@neeri.res.in](mailto:g_saravanan@neeri.res.in)

Office: 044-22544668

Mobile: 9403780405

**Academic Background**

B. Sc. (Chemistry) (Krishnagiri Arts College, University of Madras, India)

M. Sc. (Physical Chemistry) (University of Madras, India)

M. S (Physical Chemistry) (Shinshu University, Japan)

Ph.D (Physical Chemistry) (Shinshu University, Japan)

**Professional Background**

Principal Scientist: CSIR-NEERI, Chennai Zonal Centre (June 2022 - Till date)

Senior Scientist: CSIR-NEERI, Chennai Zonal Centre (June, 2016 – June 2022)

Scientist Fellow: CSIR-NEERI, Nagpur (April, 2013 – May 2016)

Research Scientist: Kanagawa University, Japan (Sep, 2012 – March, 2013)

Research Scientist: National Institute for Materials Science (NIMS), Japan (April, 2009  
– August, 2012)

Research Associate: Keio University, Japan (April, 2008 – March, 2009)

### **Area of Scientific Interest**

Broad Area: Energy and Environmental remediation Materials

- Development of catalysts for automobile exhaust purification and Indoor air purification
- Development of electrode catalysts for cleaner energy generation using fuel cells
- Water and waste water treatment
- Development of oxygen carriers for carbondioxide capture and sequestration
- Characterization studies of emissions, river sediments, raw-materials for fire crackers
- Expert member for NGT hearings

### **Awards and Honors**

### **Publications**

1. Pushpalatha Nataraj, Elizabeth Abraham and **Govindachetty Saravanan\***  
Pt-Cu Nanoalloy Catalysts: Compositional Dependence and Selectivity for Direct Electrochemical Oxidation of Formic Acid  
*New J. Chem.*, **2022**, 46, 11883
2. N. Pushpalatha, V. Sreeja, R. Karthik, and **G. Saravanan\***  
Total Dissolved Solids and their Removal Techniques  
*IJESP.*, **2022**, 2, 13–30.
3. Rohini Khobragade, **Govindachetty Saravanan,\*** Hisahiro Einaga, Hideo Nagashima, Pravesh Shukla, Tarun Gupta, Avinash Kumar Agarwal, Nitin Labhsetwar  
Diesel Fuel Particulate Emission Control using Low-cost Catalytic Materials  
*Fuel*, **2021**, 302, 121157. IF = 5.578
4. Rohini Khobragade, Pranali Dahake, Nitin Labhsetwar, **Govindachetty Saravanan,\***

PdCu Nanoalloy Catalyst for Preferential CO Oxidation in the Presence of Hydrogen

*New J. Chem.*, **2021**, *45*, 4246-4252. IF = 3.288

5. Payel Singh, Prabir Pal, Priyanka Mondal, **Govindachetty Saravanan**, Penumaka Nagababu, Swachchha Majumdar, Nitin Labhsetwar, Subhamoy Bhowmick,\*

Kinetics and mechanism of arsenic removal using sulfide-modified nanoscale zerovalent iron

*Chem. Eng. J.*, **2021**, *412*, 128667. IF = 10.652

6. Priscilla Hyacinth Cyril and **Govindachetty Saravanan\***

Advanced Materials Development for Cleaner Energy Generation through Fuel Cells

*New J. Chem.*, **2020**, *44*, 19977-19995

7. Jayasree K. Pulleri, Sunit Kumar Singh, Divya Yearwar, **Govindachetty Saravanan**, Ahmed Sadeq Al-Fatesh and Nitin K. Labhsetwar,\*

Morphology dependent catalytic activity of Mn<sub>3</sub>O<sub>4</sub> for complete oxidation of toluene and carbon monoxide

*Catal Lett.*, **2020** <https://doi.org/10.1007/s10562-020-03278-w>

8. Rohini Khobragade, Divya Yearwar, Nitin Labhsetwar, **Govindachetty Saravanan,\***

Alumina Supported Nano-platinum on Copper Nanoparticles Prepared via Galvanic Displacement Reaction for Preferential Carbon Monoxide Oxidation in Presence of Hydrogen

*Int. J. Hydrog. Energy.*, **2019**, *44*, 28757-28768, IF = 4.939

9. Rohini Khobragade, Hisahiro Einaga, Suman Jain, **Govindachetty Saravanan,\*** Nitin Labhsetwar

Sulfur Dioxide-tolerant Strontium Chromate for the Catalytic Oxidation of Diesel Particulate Matter

*Catal. Sci. Technol.*, **2018**, *8*, 1712-1721, IF = 5.773

10. **Govindachetty Saravanan\***, K. Pulleri Jayasree, Yearwar Divya, Mungse Pallavi, Labhsetwar Nitin

Ordered Intermetallic Pt-Fe Nano-catalysts for Carbon Monoxide and Benzene Oxidation

*Intermetallics*, **2018**, *94*, 179-185, IF = 3.140

11. Pallavi B. Mungse, **Govindachetty Saravanan\***, Maiko Nishibori, Jan Subrt and Nitin K. Labhsetwar

Solvent-free, Improved Synthesis of Pure Phase of Iron Manganese mixed oxide, Bixbyite as Low-cost, Potential Oxygen Carrier for Chemical Looping with Oxygen Uncoupling

*Pure Appl. Chem.* **2017** (Accepted), IF = 3.386

12. Jayasree. K. Pulleri, D. Yearwar, **G. Saravanan**, S. Rayalu and Nitin Labhsetwar  
Effect of Morphology of Platinum Nanoparticles on Benzene Oxidation Activity

*J. Nanosci. Nanotech.* **2016** (Accepted), IF = 1.338

13. Sandra Sajen, Sunit Kumar Singh, Pallavi Mungse, Sadhana Rayalu, Kosuke Watanabe, **Govindachetty Saravanan** and Nitin Labhsetwar\*

Mechanically Stable Mixed Metal Oxide of Cu and Mn as Oxygen Carrier for Chemical Looping Syngas Combustion

*Energy&Fuels*, **2016**, *30*, 7596-7603, IF = 2.835

14. **Govindachetty Saravanan\***, Rohini Khobragade, Laxmi Chand Nagar, Nitin Labhsetwar

Ordered Intermetallic Pt-Cu Nanoparticles for Catalytic CO Oxidation Reaction

*RSC Adv.*, **2016**, *6*, 85634–85642, IF = 3.289

15. Pallavi Mungse, **Govindachetty Saravanan\***, Sadhana Rayalu and Nitin Labhsetwar\*

*Mixed Oxides of Fe and Mn as Low-cost, Potential Oxygen Carrier for Chemical Looping Combustion*

*Energy Technol.*, **2015**, 8, 3, 856-865. IF= 2.557, (ISSN: 2194-4296),

16. Nitin Labhsetwar, **Govindachetty Saravanan**, Suresh Kumar Megarajan, Nilesh Manwar, Rohini Khobragade, Pradeep Doggali, Fabien Grasset

*Perovskite-type Catalytic Materials for Environmental Applications*

*Sci. Technol. Adv. Mater*, **2015**, 3, 16, 036002. IF= 3.513 (ISSN: 1878-5514)

17. Takao Gunji, Toyokazu Tanabe, Arockiam John Jeevagan, Sho Usui, Takashi Tsuda, Shingo Kaneko, **Govindachetty Saravanan**, Hideki Abe, Futoshi Matsumoto\*  
*Facile Route for the Preparation of Ordered Intermetallic Pt<sub>3</sub>Pb-PtPb Core-Shell Nanoparticles and Its Enhanced Activity for Alkaline Methanol and Ethanol Oxidation*  
*J. Power Sources*, **2015**, 273, 990-998 IF: 6.333 (ISSN: 0378-7753)

18. Hideki Abe, Hideki Yoshikawa, Naoto Umezawa, Ya Xu, **Govindachetty Saravanan**, Gubbala V. Ramesh, Toyokazu Tanabe, Rajesh Kodyath, Shigenori Ueda, Nobuaki Sekido, Yoko Yamabe-Mitarai, Masahiko Shimoda, Takahisa Ohno, Futoshi Matsumoto, and Takayuki Komatsu

*Correlation between the Surface Electronic Structure and CO-oxidation Activity of Pt Alloys*

*Phys. Chem. Chem. Phys.*, **2015**, 7, 17, 4879-4887; IF: 4.449 (ISSN 1463-9076)

19. Takao Gunji, Toyokazu Tanabe, **Govindachetty Saravanan**, Shingo Kaneko, Hideki Yoshikawa, Yoshitaka Matsushita, Nobuaki Sekido, Ya Xu, Shigenori Ueda, Hideki Abe, and Futoshi Matsumoto

*Enhanced activity for oxygen reduction reactions by carbon-supported high-index-facet Pt-Ti nanoparticles*

*Electrochemistry*, **2015**, 1, 83, 7-11, IF: 0.66 (ISSN: 2186-2451)

20. Pallavi Mungse, **Govindachetty Saravanan**\*, Tomoki Uchiyama, Maiko Nishibori, Yasutake Teraoka, Sadhana Rayalu, and Nitin Labhsetwar\*

*Copper-Manganese Mixed Oxides: CO<sub>2</sub>-selectivity, Stable, and Cyclic Performance for Chemical Looping Combustion of Methane*

*Phys. Chem. Chem. Phys.*, **2014**, 36, 16, 19634-19642; IF: 4.449 (ISSN 1463-9076)

21. Takao Gunji, Takashi Tsuda, Arockiam John Jeevagan, Masanari Hashimoto, Toyokazu Tanabe, Shingo Kaneko, Masahiro Miyauchi, **Govindachetty Saravanan**, Hideki Abe, and Futoshi Matsumoto

*Visible Light Induced Decomposition of Organic Compounds on WO<sub>3</sub> Loaded PtPb Co-catalysts*

*Cat. Comm.*, **2014**, 56, 96-100; IF: 3.389 (ISSN: 1566-7367)

22. Nor A. Fadil, **Govindachetty Saravanan**, Gubbala V. Ramesh, Futoshi Matsumoto, Hideki Yoshikawa, Shigenori Ueda, Toyokazu Tanabe, Toru Hara, Shinsuke Ishihara, Hideyuki Murakami, Katsuhiko Ariga, and Hideki Abe

*Synthesis and Electrocatalytic Performance of Atomically Ordered Nickel Carbide (Ni<sub>3</sub>C) Nanoparticles*

*Chem. Commun.*, **2014**, 49, 50, 6451-6453; IF: 6.567, (ISSN 1364-548X) Royal Society of Chemistry (Highlighted as cover page article)

23. Francis Malar Auxilia, Shinsuke Ishihara, Saikat Mandal, Toyokazu Tanabe, **Govindachetty Saravanan**, Gubbala V. Ramesh, Naoto Umezawa, Toru Hara, Ya Xu, Shunichi Hishita, Yusuke Yamauchi, Arivuoli Dakshanamoorthy, Jonathan P. Hill, Katsuhiko Ariga,\* and Hideki Abe\*

*Low-temperature remediation of NO catalyzed by interleaved CuO nanoplates*

*Adv. Mater.* **2014**, 26, 26, 4481-4485., IF: 18.96 (ISSN: 1521-4095) (Highlighted as cover page article)

24. Takao Gunji, **Govindachetty Saravanan**,\* Toyokazu Tanabe, Takashi Tsuda, Masahiro Miyauchi, Genki Kobayashi, Hideki Abe, and Futoshi Matsumoto

*Long-term, Stable, and Improved Oxygen-Reduction Performance of Titania-supported PtPb Nanoparticles*

*Catal. Sci. Technol.*, **2014**, 5, 4, 1436-1455. IF: 5.287, (ISSN 2044-4761) Royal Society of Chemistry

25. Francis M. Auxilia, Toyokazu Tanabe, Shinsuke Ishihara, **Govindachetty Saravanan**, Gubbala V. Ramesh, Futoshi Matsumoto, Xu Ya, Katsuhiko Ariga, Arivuoli Dakshanamoorthy, Hideki Abe

*Interleaved Mesoporous Copper for the Anode Catalysis in Direct Ammonium Borane Fuel Cells*

*J. Nanosci. Nanotech.* **2014**, 6, 14, 4443-4448. IF: 1.556 (ISSN: 1533-4899)

26. **Govindachetty Saravanan**, Kazuya Nanba, Genki Kobayashi, and Futoshi Matsumoto

*Leaching Tolerance of Anodic Pt-based Intermetallic Catalysts for Formic Acid Oxidation*

*Electrochimica Acta* **2013**, 99, 15-21. IF: 4.803 (ISSN: 0013-4686)

27. **Govindachetty Saravanan**,\* Toru Hara, Hideki Yoshikawa, Yoshiyuki Yamashita, Shigenori Ueda, Keisuke Kobayashi and Hideki Abe,\*

*Post-synthesis Dispersion of Metal Nanoparticles by Poly(amidoamine) Dendrimers: Size-Selective Inclusion, Water Solubilization, and Improved Catalytic Performance*  
*Chem. Commun.*, **2012**, 60, 48, 7441–7443. IF: 6.567 (ISSN 1364-548X) (Highlighted as cover page article)

28. **Govindachetty Saravanan**\* and Hideki Abe\*

*Influence of pH on Dendritic Structure of Strongly Fluorescent Persulfate-treated Poly(amidoamine) Dendrimer*

*J. Photochem. Photobiol. A*, **2011**, 224, 102-109. IF: 2.477 (ISSN: 1010-6030)

29. **Govindachetty Saravanan**, Kenji Daigo, Toyoko Imae, and Takao Hamakubo  
*Visual observation of avidin-biotin affinity by fluorescent G4.5 poly(amidoamine) dendrimer*

*Colloids and Surfaces B: Biointerfaces*, **2011**, 83, 58-60. IF: 3.902 (ISSN: 0927-7765)

30. **Govindachetty Saravanan** and Toyoko Imae

*Visual observation and characterization of fluorescent poly(amidoamine) dendrimer in film state*

*J. Nanosci. Nanotech.* **2011**, 6, 11, 4838-4845. IF: 1.556 (ISSN: 1533-4899)

31. **Govindachetty Saravanan**\*, Hideki Abe\*, Ya Xu, Nobuaki Sekido, Hirohito Hirata, Shin-ichi Matsumoto, Hideki Yoshikawa, and Yoko Yamabe-Mitarai

*Pt<sub>3</sub>Ti Nanoparticles: Fine Dispersion on SiO<sub>2</sub> Supports, Enhanced Catalytic CO Oxidation and Chemical Stability at Elevated Temperatures*

*Langmuir*, **2010**, 13, 26, 11446-11451. IF: 3.993 (ISSN: 1520-5827)

32. Saikat Mandal, Marappan Sathish, **Govindachetty Saravanan**, K. K. R. Datta, Qingmin Ji, Jonathan P. Hill, Hideki Abe, Itaru Honma, and Katsuhiko Ariga

*Open-Mouthed Metallic Microcapsules: Exploring Performance Improvement at Agglomeration-Free Interiors*

*J. Am. Chem. Soc.* **2010**, 41, 132, 14415-14417. IF: 13.038 (ISSN: 1520-5126)

33. **Govindachetty Saravanan**, Sumio Ozeki

*Magnetic Field Control of Electron Tunneling Pathways in the Monolayer of (Ferrocenylmethyl)dodecyldimethylammonium Bromide on a Gold Electrode*

*J. Phys. Chem. B* **2008**, 1, 112, 3-6. IF: 3.187 (ISSN: 1520-5207)

34. **Govindachetty Saravanan**, Katsuhiko Fujio, Sumio Ozeki

*Magnetic Field Effects on Electric Behavior of [Fe(CN)<sub>6</sub>]<sup>3-</sup> at Bare and Membrane-coated Electrodes*

*Sci. Technol. Adv. Mater.* **2008**, 9, 1-7. IF: 3.513 (ISSN: 1878-5514)

### **Reports Published**

1. Conducting Study of Vrushabhavathi River Valley in Bengaluru city for the purpose of Protection, Restoration and Rejuvenation. BBMP, Bengaluru, **2022**
2. Preliminary assessment of water- and sediment- quality of Sarkarperiyapalyam (Nanjarayan) lake, Tirupur in response to a communication from PWD, Tiruppur, **2022**
3. *Assessment of Water Quality and Sediment to Understand the Special Properties of River Ganga*; The Ministry of Water Resources, River Development and Ganga Rejuvenation, Gol, New Delhi. **2017**.

### **Publications- Non-SCI Journals**

1. Hideki Abe, **Govindachetty Saravanan**, Ya Xu, Nobuaki Sekido, Yoko



Yamabe-Mitarai, and Masahiko Shimoda

Synthesis and Catalytic Performance of Intermetallic Nanoparticles

*Materia* **2010**, *49*, 314-316.

2. Ichiro Otsuka, **Govindachetty Saravanan**, Yuta Honma, Sumio Ozeki, Takenori Nakayama, Tetsuro Hosogi, Akihiko Ishibashi

Corrosion Inhibition of Copper due to Magnetic Treatment of Water

*Journal of the JRICu*, **2007**, *46*, 243-247.

3. Ichiro Otsuka, **Govindachetty Saravanan**, Sumio Ozeki, Takenori Nakayama, Tetsuro Hosogi, Chikara Saeki

Magnetic Treatment Effects of Water on Corrosion of Copper

*Journal of the JRICu*, **2006**, *45*, 174-178.

### **Conference Proceedings**

1. Arockiam John Jeevagan, Takao Gunji, Naoyuki Sawano, **Govindachetty Saravanan**, Taiki Kojima, Shingo Kaneko, Genki Kobayashi, Futoshi Matsumoto  
Two-Step Microwave Synthesis of Highly Dispersed Ordered Intermetallic PtPb Nanoparticles on Carbon Black

*ECS Trans.* **2014**, *58*, (in press)

2. Arockiam John Jeevagan, Yukiko Suzuki, Takao Gunji, **Govindachetty Saravanan**, Yuta Irii, Takashi Tsuda, Toshiaki Onobuchi, Shingo Kaneko, Genki Kobayashi, Futoshi Matsumoto

Electrocatalytic Oxygen Reduction and Water-Oxidation on Transition Metal Ion-Doped MnO<sub>2</sub>, RuO<sub>2</sub> and IrO<sub>2</sub> in Alkaline Aqueous Solutions

*ECS Trans.* **2014**, *58*, 25-31

3. Futoshi Matsumoto, **Govindachetty Saravanan**, Genki Kobayashi

Application of Ordered Intermetallic Phases to Electrocatalysis

*ECS Trans.* **2013**, *50*, 3-8.

4. Nor Akmal Fadil, **Govindachetty Saravanan**, Hideki Yoshikawa, Yoshiyuki Yamashita, Shigenori Ueda, Keisuke Kobayashi, Toyokazu Tanabe, Toru Hara,

Gubbala Venkata Ramesh, Hideyuki Murakami, Kazuhiko Noda, Hideki Abe  
Wet Chemical Synthesis of Ni-Al Nanoparticles at Ambient Condition  
*Advanced Materials Research*, **2012**, Vol. 557-559, 442-447.

### **Book Chapter**

1. Locomotive Catalytic Control Options for Diesel Particulate Emissions Including that from Locomotive Engines

Locomotives and Rail Road Transportation, pp 169-192, 11 February 2017

Sunit K. Singh, Rohini Khobragade, **Govindachetty Saravanan**, Avinash K. Agarwal, Ahmed S. AL-Fatesh, Nitin K. Labhassetwar

2. Analysis of AC impedance results of formic acid oxidation on electrode catalysts, Technical Information Institute Co., Ltd. Japan. 2013, p.386

Futoshi Matsumoto and **Govindachetty Saravanan**

### **Invited Lectures**

1. 92<sup>nd</sup> Spring Meeting, The Chemical Society of Japan, held on 25~28-3-2012 at KeioUniversity, Yokohama, Japan. Invited Lecture entitled “**Intermetallic Pt<sub>3</sub>Ti Nanoparticles: Efficient Catalytic Centers for Exhaust Purification and Energy Applications**”.

2. Tropo Mass Spectrometry (TMS) symposium held on 26<sup>th</sup> Jan 2013 at Kanagawa University, Japan. Invited lecture entitled “**Efficient approaches for the reduction in the amounts of platinum towards exhaust purification and fuel cell applications**”.

3. 16th National Workshop on “Catalysis for Sustainable Development” held on 4~5-2-2014 at CSIR-National Environmental Engineering Research Institute (CSIR-NEERI), Nagpur, India. Invited Lecture entitled “**Efficient methods for the reduction in the amounts of platinum for catalytic applications**”

4. Self-sponsored workshop at VNIT-Nagpur. Invited lecture entitled “**Spectral Data Analysis and Spectral Interpretation for Structure Elucidation**”

5. Short Terms Training Program (STTP) on “Advances in Separation Technology” entitled “**Separation Techniques and Their Importance for Energy and Environmental-related Applications**”

6. NATIONAL SEMINAR ON RECENT ADVANCES IN CHEMISTRY (NSRAC)-2019, **Nano Platinum-based Intermetallic or Alloy Catalysts: Sustainable Option for Energy and Environmental Remediation Applications**

7. Delivered inaugural address (Scientium 2020) on Science day (28-02-2020) at Kongu Eng. College, Tamilnadu

8. Delivered Invited Lecture on ***Advanced Materials for Environmental Remediation Applications*** in A two-day-National Level Seminar on Urban Pollution, Environment and Health (UPEH) at Coimbatore Institute of Technology, Tamilnadu, 2020.

9. Delivered Invited Lecture on ***Engineered Surfaces for Energy and Environmental Remediation Applications*** in National Level Webinar Series on *Recent Trends in Applied sciences at Tamilnadu Open University, Chennai. 2021.*

10. Delivered Invited Lecture on ***Platinum Group Metals-based Nanoalloys as Low-cost Promising Alternatives for Indoor and Outdoor Applications*** in *12<sup>th</sup> International Conference (Virtual) on Advancements in Polymeric Materials 9-13, Mar. 2021.*

11. Delivered Invited Lecture on ***Environmental Remediation Materials for Sustainable Developments*** in FDP, Adhiyamaan College of Eng., 04 Aug. 2021.

12. Delivered Invited Lecture on **Engineered Materials: Sustainable Option for Environmental Remediation Applications** in *New Perspectives of Chemistry*, Kongunadu Arts and Science College., 15 Mar. 2022

13. Delivered Invited Lecture on **Engineered Nano-alloy Catalysts: Sustainable Option for Energy and Environmental Remediation Applications** in *2nd International Conference on Advances in Chemistry with Specific Reference to Catalysis, Sensors, Drug Delivery and Energy Materials (ICACSEM – 2022)*, 28&29<sup>th</sup> March 2022.

### **Patents**

1. Labhassetwar Nitin Kumar, Govindachetty Saravanan, Rakesh Kumar, Khobragade Rohini Ashokrao “**Development of substituted perovskites for diesel soot oxidation and process for the preparation thereof**” PATENT No.: 372495. (**Granted**)

2. Hideki Abe, Francis Malar Auxilia, Shinsuke Ishihara, Toyokazu Tanabe, **Saravanan Govindachetty**, Gubbala Venkata Ramesh, Toru Hara, Ya Xu, Shunichi Hishita, Katsuhiko Ariga

**Self-assembled single crystalline petal-like nanostructured catalyst and its preparation**

JP 2012-115599, **May 21, 2012** (Filed)

3. Abe Hideki; Noor Akmal Phadil; Murakami Hideyuki; Yoshikawa Hideki; Yamashita Yoshiyuki; Ueda Shigenori; Tanabe Toyokazu; Gubbala Venkata Ramesh; Saravanan Govindachetty

**Oxidation-resistant NiAl nanoparticle and method of producing the same, and oxidation-resistant NiAl nanoparticle-containing Bond coat layer**

JP6099251, Mar 3, 2017. (**Granted**)

4. Abe Hideki; Noor Akmal Phadil; Murakami Hideyuki; Yoshikawa Hideki; Yamashita Yoshiyuki; Ueda Shigenori; Tanabe Toyokazu; Gubbala Venkata Ramesh; Saravanan Govindachetty, Ishihara Shinsuke, Ariga Katsuhiko

**Small Diameter Ni<sub>3</sub>C Nanoparticle And Production Method Of The Same**

JP5991670, Aug 26, 2016. (**Granted**)

5. Hideki Abe, Hideyuki Murakami, Fadil Nor Akmal, **Saravanan Govindachetty**, Toyokazu Tanabe, Gubbala Venkata Ramesh  
**Electroless plating in non-aqueous solutions**  
JP 2012-115600, May 21, **2012** (Filed)
  
6. Hideki Abe, **Saravanan Govindachetty**, Toru Hara, Hideki Yoshikawa, Yoshiyuki Yamashita, Shigenori Ueda, Keisuke Kobayashi  
**Preparation of electrode catalyst comprising of nanoparticles encapsulated dendrimer and their assembly**  
JP 2012-090413, Apr 11, **2012**. (Filed)
  
7. Abe Hideki; Francis Malar Auxilia; Ishihara Shinsuke; Tanabe Toyokazu; Saravanan Govindachetty; Venkata Ramesh Gubbala; Hara Toru; Kyo Tsugi; Hishida Shunichi; Ariga Katsuhiko  
**Single nanocrystal board-accumulative catalyst**  
JP6099238, Mar 3, 2017. (**Granted**)
  
8. Hideki Abe, Ya Xu, Yoko Mitarai, Nobuaki Sekido, **Saravanan Govindachetty**  
**Exhaust gas cleaning catalyst and method of manufacturing the same**  
JP5798425, Aug 28, **2015**. (**Granted**)
  
9. Hideki Abe, **Saravanan Govindachetty**, Katsuhiko Ariga  
**Metallic cells**  
JP5818244, Oct 9, **2015**. (**Granted**)
  
10. Hideki Abe, **Saravanan Govindachetty**, Toru Hara, Hideki Yoshikawa, Keisuke Kobayashi, Yoshiyuki Yamashita, Shigenori Ueda  
**Preparation of Strongly Fluorescent Nanoparticles Encapsulated Dendrimer**  
JP 5728780, Apr 17, **2015**. (**Granted**)
  
11. Hideki Abe, Ya Xu, Yoko Mitarai, Nobuaki Sekido, **Saravanan Govindachetty**, Shin-ichi Matsumoto, Hirohito Hirata, **Supported catalyst**  
JP 5623070, Oct 3, **2014**. (**Granted**)

## **Projects**

### **On-going**

1. Hydrogen Mission (CSIR)
2. Raw-material characterization of Fireworks (Component Lead)  
CSIR
3. To prepare an action plan for remediation of entire affected Periyar river bodies/stretchches including remediation of polluted stretch (Kuzhikandam Thodu), Kerala, Supervised Committee Member, NGT

### **Completed**

- Minimization of the amount of platinum for automobile exhaust treatments through intermetallics based catalysts, (PI)
  - Science and Engineering Research Board, India
- Low-cost and shape-tailored Nano-catalysts for Volatile Organic Compounds Emission control (PI)
  - Nano mission/ Department of Science and Technology
- Water quality monitoring and sediment analysis for the Ganga River from Gomukh to Gangasagar (Team Member)
  - NMCG, Ministry of water resources and river rejuvenation
- TapCoal Project under 12<sup>th</sup> Five Year Plan. CSIR Network Project (Development of new/modified materials with high oxygen carrying capacity for chemical looping combustion (CLC). (Co-PI)
  - CSIR-Network project CSC-0102
- 5 Low-cost, Nano-Intermetallic / Alloy Catalysts as Promising Alternative to Expensive Platinum Catalyst for Fuel Cells (PI)
  - Science and Engineering Research Board, India

- Development of Low-cost Oxidation Catalysts for Diesel Exhaust Emission Control (Co-PI)
  - Science and Engineering Research Board, India
  
- Development of Novel Perovskite materials as a Suitable Candidate for Soot Oxidation (Co-PI)
  - Science and Engineering Research Board, India
  
- A detail study to understand the non-putrefying property of River Ganga in both water and sediment (Component Lead)
  - NMCG, Ministry of water resources and river rejuvenation

### **Committee**

Lifetime membership in

- CATALYSIS SOCIETY OF INDIA
- VIBHA
- Research Council (RC) Member for Tamilnadu Open University