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h-INDEX: 30 **(GOOGLE SCHOALR CITATIONS)**

NUMBER OF CITATIONS: >4300 **(GOOGLE SCHOALR CITATIONS)**

AVERAGE IMPACT FACTOR (IF): 3.9545

RESEARCH AREAS OF INTEREST

- Hydrogen Energy (Sensors, Leak Detectors, Separation Membranes)
- Textile Wastewater Treatment (Surface Plasmon Resonance, Advanced Oxidation Processes (Fenton-like, Ultrasound Cavitation, Ozonation), Adsorption, Photocatalysis)
- Adsorbent and Catalyst Development (0, 1, and 2-Dimensional Nanostructures, Magnetic Composites (Core-Shell, Nano-Nano / Micro-Nano Integrated)
- Process Development (Ion-Exchange, Hydrothermal, Sol-Gel, Inverse Co-precipitation, Thermal Evaporation, Electrospinning)

WORK EXPERIENCE

- **Senior Principal Scientist (2022-Till Date)**
- **Principal Scientist (2015-2021)**
- **Senior Scientist (2011-2014)**
  CSIR-NIIST, Thiruvananthapuram, Kerala, India

- **IUSSTF Research Fellow (2009-2010)**
  Indo-US Science and Technology Forum (IUSSTF) Research Fellowship
  Argonne National Laboratory (ANL), Argonne, Illinois, U.S.A.

- **Scientist (2008-2010)**
- **Scientist-Fellow (2006-2007)**
  CSIR-NIIST, Thiruvananthapuram, Kerala, India

➢ **Project-1 (# HCP-44):** Development Electronic Hydrogen Leak Detector
Status: Completed
Funding: CSIR Hydrogen Technology Mission Program
Budget: ₹ 75.0 Lakh
Duration: 3 Years (April-2022 to March-2025)

Description: The major objective of this project is to develop an Electronic Hydrogen Leak Detector (EHLD) which has been funded by the CSIR Hydrogen Technology (H2T) Mission Program for detecting leakages in the Type IV hydrogen storage tanks which are being developed by the CSIR-Central Mechanical Engineering Research Institute (CMERI), Durgapur. Microelectromechanical system (MEMS) devices have been fabricated having an interdigitated electrode configuration with the controlled number of electrodes and electrode spacing. These MEMS devices are being integrated with the various 1-D nanocrystalline semiconductor-oxides synthesized via the wet-chemical approaches for the development of MEMS-based sensor which could detect ppm level of hydrogen leak under the ambient conditions. The MEMS devices have been manufactured in collaboration with the Centre for Nano Science and Engineering (CeNSE) at the Indian Institute of Science (IISc), Bengaluru. A software-controlled Dynamic Gas Sensing System (DGSS) is being manufactured by the Ants Innovations Pvt. Ltd., Vasai (Mumbai) in collaboration with the Excel Instruments, Mumbai and Dynamic Control Systems, Mumbai. This indigenously developed facility would be utilized for determining the most optimum coated MEMS-based sensor which would be integrated with an EHLD. The latter has been designed by CSIR-NIIST and manufactured by the Holmarc Opto-Mechatronics Ltd., Kochi. The Non-disclosure Agreement (NDA) has been signed by CSIR-NIIST with the transport, electronic, chemical industries and a space agency for the development of EHLD.

- **Project-2 (# GAP235339):** Dark-Catalytic and Planar Solar-Concentrator Based Reactors for Removal of Organic Pollutants from Textile Effluents
  Status: Completed
  Funding: DST-TMD(EWO)/OWUIS
  Budget: ₹ 43.87 Lakh
  Duration: 2 Years and 6 Months (October-2019 to March-2022)
  Description: In this project, the real time textile effluents containing the organic synthetic dyes, received from the Kerala Industrial Infrastructure Development Corporation (KINFRA), Kannur, Kerala and Karnataka State Garment Washing Owners Association (KSGWOA), Bengaluru, Karnataka, having an initial chemical oxygen demand (COD) level in between 221-1,335 mg L^{-1} were tested by using the different stand-alone reactors which utilize the Fenton-like, ultrasound (US) cavitation, and ozone (O_3) based advanced oxidation process (AOPs). The hybrid reactors, consisting of Fenton-like and US cavitation based AOPs as pre-treatment reactors with O_3 based AOP as a post-treatment reactor, were are also utilized for the treatment of textile effluents. The comparison of respective performance shows that the reactor involving the Fenton-like AOP as a pre-treatment reactor with the O_3 based AOP as a post-treatment reactor provides a maximum COD removal of 93%. A semiconductor-oxide coated planar solar-concentrator based photocatalytic reactor was also developed for the removal of organic synthetic dyes from an aqueous solution.

- **Project-3 (# MLP0012):** Advanced Magnetic Nanocomposites for Textile Water Treatment Using Modified Dark-Catalysis Process
  Status: Completed
  Funding: CSIR, India
  Budget: ₹ 5 Lakh
  Duration: 1.3 Years (January-2016 to March-2017)
  Description: Due to their toxic and health hazardous nature, organic synthetic-dyes cause severe environmental pollution. Hence, their removal from the aqueous solutions and industry effluents using the efficient and cost-effective technologies is essential. Although various processes (flocculation, coagulation, sedimentation, bio-remediation, photocatalysis, and electrolysis) have been reported, they are associated with major limitations. The mechanisms based on the advanced oxidation processes (AOPs), such as the Fenton and Fenton-like reactions appear to be promising for this application since these processes do not require an exposure to the external radiation and use of an

external power-source. Nevertheless, in order to realize the commercialization of AOPs, few hurdles need to be resolved soon. PI has successfully developed a novel dark-catalysis process for the removal of organic synthetic-dyes from the aqueous solutions and industry effluents involving the activation of hydrogen peroxide (H_0O_2) using hydrothermally synthesized nanotubes of semiconductor oxides (hydrogen titanate ($H_2Ti_3O_7$) and anatase-titania (TiO_2)) to generate the reactive oxygen species (ROS, such as •OH and O_2•- radical ions) which attack and degrade the organic dye molecules. To ease the separation of catalyst from the treated aqueous solutions, advanced magnetic nanocomposites have been successfully developed. However, the cost of dye-removal via dark-catalysis process using the magnetic nanocomposites is higher due to the involvement of costlier H_2O_2. Hence, the major objective of this project was set to identify and use highly efficient and cost-effective oxidizers, as an alternative to H_2O_2, to reduce the cost of dark-catalysis process.

- **Project-4 (# OLP216339):** Novel Micro-Nano Integrated Composite Particles as Dye-Adsorbent Catalyst
  Status: Completed
  Funding: CSIR, India
  Budget: ₹ 10 Lakh
  Duration: 2 Years (October-2010 to September-2012)
  Description: In this project, flyash (a waste by-product of thermal power plants) was utilized for the removal of an organic synthetic-dye from an aqueous solution via the surface-adsorption mechanism. The major objectives of this project were to modify the flyash surface via the innovative approaches to enhance its specific surface area, which would facilitate the enhancement of its dye-adsorption capacity and also to develop novel techniques for its recycling.

- **Project-5 (# NWP0010):** Development of Titania-Based Functionally Graded Nanocomposite as a Photocatalyst for Dye-Removal Application
  Status: Completed
  Funding: CSIR, India (Part of Network Project # NWP0010)
  Budget: ₹ 2.68 Crore (for 5 Scientists)
  Duration: 5 Years (April-2007 to March-2012)
  Description: In this project, an organic-synthetic dye-removal using the sol-gel derived nanocrystalline titania (TiO_2) was investigated under an exposure to the ultraviolet (UV) and solar-radiations. The effects of various parameters such as the specific surface-area, amount of rutile-TiO_2, surface-deposited nano-clusters of noble metals, and powder-morphology on the dye-degradation kinetics was systematically studied. The removal of an organic-synthetic-dye via the surface-adsorption mechanism operating under the dark-condition using the hydrothermally processed hydrogen titanate ($H_2Ti_3O_7$) and anatase-TiO_2 nanotubes was also demonstrated. To ease the solid-liquid separation after the effluent treatment, the magnetic photocatalyst was successfully processed which was further modified to magnetic dye-adsorbent catalyst to overcome the limitations of the former. The recycling of semiconductor oxides-based nanotubes, via the dark-catalysis process, in the dye-removal application was demonstrated for the first time.

- **Project-6 (# P81113):** Young Scientist Award (YSA)
  Status: Completed
  Funding: CSIR, India
  Budget: ₹ 25 Lakh
  Duration: 5 Years (April-2009 to March-2014)
  Description: In this project, the research grant was provided towards the consumables, equipments, spares, maintenance support, international / national travel in connection with the aforementioned CSIR-EMPOWER and CSIR-Network projects.

RESEARCH EXPERIENCE

- **Research Associate (Post-Doctoral Fellow) (2002-2006)**
  University of Central Florida (UCF), Orlando, Florida, U.S.A
- **Research Assistant (1998-2002)**
  University of Central Florida (UCF), Orlando, Florida, U.S.A.
- **Graduate Student (1994-1998)**
  Indian Institute of Technology (IIT), Mumbai, India

➢ **Project-1:** Development of Low Temperature Nanocrystalline Semiconductor-Oxides-Based Hydrogen Sensor
Status: Completed
Funding: NASA-Glenn, U.S.A.
Collaborator: Kennedy Space Center (KSC-NASA), Titusville, Florida
Duration: 3 Years (2002-2005)
Description: In this project, hydrogen sensor based on the sol-gel derived nanocrystalline (average film thickness: ~125 nm and average nanocrystallite size: ~1-3 nm) indium oxide (In_2O_3)-doped tin oxide (SnO_2) thin film, incorporated into the microelectromechanical systems (MEMS) device, was developed. This "Nano-Micro" integrated sensor detected hydrogen at room temperature with the maximum sensitivity as high as 10^5 with the response and recovery time of ~200-300 sec. This MEMS-based sensor exhibited very high hydrogen selectivity over carbon monoxide (CO) at room temperature and detected hydrogen in the inert helium (He) atmosphere. The room temperature response kinetics of sensor was studied as a function of hydrogen concentration (100 ppm-1 vol.%), air-pressure (50-760 Torr), and electrode-spacing (10-20 μm). A new theoretical model was developed which satisfactorily explained the hydrogen sensing characteristics of semiconductor-oxides-based thin film gas sensors.

➢ **Project-2:** Development of Nanocrystalline Barium/Strontium Cerate Membranes for Hydrogen Selective Sensor
Status: Completed
Funding: National Science Foundation (NSF, U.S.A.) and Florida Space Grant Consortium (FSGC, U.S.A.)
Collaborator: Florida Solar Energy Center (FSEC-UCF, U.S.A.)
Duration: 1 Year (2003-2004)
Description: In this project, the nanocrystalline perovskite-structured ceramic-oxide powders and thin film membranes, useful for an effective hydrogen separation from the stream of gaseous mixture, were developed. The nanocrystalline powders and thin films of barium and strontium cerates were synthesized via the microemulsion and polymer-precursor-based techniques and characterized using the various analytical techniques such as the dynamic laser scattering (DLS), thermal gravimetric and differential thermal analyzer (TG/DTA), X-ray photoelectron spectroscope (XPS), focused ion-beam (FIB) milling, high-resolution transmission electron microscope (HRTEM), atomic force microscope (AFM), and X-ray diffraction (XRD). The hydrogen separation thin film membranes were beneficial in imparting the required hydrogen selectivity to the hydrogen sensors which were developed in the Project-1 (under Research Experience).

➢ **Project-3:** Repair of Damaged Plasma-Sprayed Thermal Barrier Coatings (TBCs) via Sol-Gel
Status: Completed
Funding: Siemens Westinghouse Inc., Orlando, Florida, U.S.A.
Duration: 1 year (2002-2003)
Description: In this project, the surface-damaged TBC-samples, consisting nickel/cobalt-based superalloys, which were surface-coated with the thermal-sprayed MCrAlY bond-layer, with the plasma-sprayed yttria-stabilized zirconia (YSZ) as a top-layer, were supplied by the Siemens Westinghouse Inc., U.S.A.. The as-received TBC-samples

exhibited rough-surfaces and surface-cracks. The sol-gel derived nano-zirconia sol and gel were prepared and utilized to seal the surface-cracks to improve the surface-finish of the damaged TBC-samples by using different approaches such as the “drop-method”, “spray-method”, and “gel-method”. The “drop-method” was identified to be the most suitable technique to improve the surface-finish of damaged-TBC samples as it resulted in the thermal-fatigue-life of repaired area comparable with that of the original plasma-sprayed TBC within the temperature range of 1000-1150^{o}C.

- **Project-4:** Development of Sol-Gel Method for Processing Nanocrystalline Zirconia
  Status: Completed
  Funding: US-Australia Joint Research and NSF-REU, U.S.A.
  Duration: 2 Years (2000-2002)
  Description: In this project, the nanocrystalline zirconia powder was synthesized using the conventional and modified sol-gel methods. In the latter, hydroxypropyl cellulose (HPC) polymer was utilized as a steric-stabilizer to avoid the aggregation of zirconia nanoparticles within the sol. The effect of various processing parameters such as the ratio of molar concentration of water to that of alkoxide-precursor (R=5-60), amount (0-2.0 g/L) and molecular weight (80,000-1,000,000 g/mol) of HPC polymer, and calcination temperature (400-1200^{o}C) on the average zirconia nanoparticle size and the volume fraction of metastable tetragonal phase was systematically studied. The precise concentration of HPC polymer required for 100% metastable tetragonal phase stabilization, at room temperature, was determined. A new mechanism for the metastable tetragonal phase stabilization in nanocrystalline zirconia was proposed.

- **Project-5:** Development of Electroless Process for Manufacturing Conducting Polymers using Copper-Coated Flyash Particles
  Status: Completed
  Funding: United States Natural Resources (USNR, U.S.A.)
  Duration: 2 Years (1998-2000)
  Description: In this project, a silicone-based conducting polymer was manufactured for electromagnetic interference shielding application. The copper- and silver-coated flyash particles (waste byproduct of thermal power plants) were dispersed in the non-conducting polymer matrix to make it conducting. An electroless metal-coating process was developed for this purpose. By utilizing this process, a controlled deposition of nanocrystalline copper and silver over the surface of flyash particles, with the desired thickness, was possible. To reduce the overall cost of electroless metal-coating process, cheaper surface-activators were developed.

- **Project-6:** Superplastic Deformation of Zr-2.5 wt.% Nb Pressure-Tube Alloy
  Status: Completed
  Funding: Board of Research in Nuclear Sciences (BRNS), India
  Collaborator: Bhabha Atomic Research Center (BARC), Mumbai, India
  Duration: 2 Years (1996-1998)
  Description: In this project, the superplastic nature of Zr–2.5 wt.% Nb alloy, which is a material used for pressure-tubes in the Pressurized Heavy Water Reactors (PHWR), was established. The tensile specimens of this alloy were deformed at different initial strain-rates within the range of 3.2×10^{-4}–2.9×10^{-2} s^{-1}, at different test-temperatures (T) within the range of 625–800 °C, to investigate the nature of stress–strain curves and to determine optimum conditions for the superplasticity. Maximum ductility of 1384% was obtained at T=700°C and intermediate initial strain-rate of 3.4×10^{-3} s^{-1}. The effect of initial strain-rate and test-temperature on the variation in the strain-rate sensitivity-factor (m) was also established. The effect of these test-variables on the amount of grain-growth and the change in the grain-shape was also studied as a function of strain to confirm the superplastic nature of this alloy.

QUALIFICATIONS

- **Ph.D., 2002, Materials Science and Engineering**
  University of Central Florida (UCF), Orlando, Florida, U.S.A.
  Dissertation: Synthesis and Characterization of Sol-Gel Derived Nanomaterials and Nanocrystalline Electroless Metals Coating

- **M. Tech., 1996, Materials Science and Engineering**
  Indian Institute of Technology Bombay (IIT-B), Mumbai, India
  Dissertation: Superplastic Deformation and Concurrent Microstructural Evolution in Zr-2.5 wt.% Nb Alloy

- **B.E., 1994, Metallurgy**
  Savitribai Phule Pune University, Pune, India
  Dissertation: Ferritic Nitrocarburizing of Mild Steel in Fluidized Bed Furnace

PATENTS GRANTED (# 11)

- **S.V. Shukla,** K.G.K. Warrier, B.V. Kishakkekillkoodayii, T. Shijitha, "Process for the Surface-modification of Flyash and Industrial Applications Thereof", Indian Patent No. 389782 (Granted on 20-February-2022).
- **S.V. Shukla,** H. Padinhattayil, H. Narayani, M. Jose, R. Karunakaran, **"**Semiconductor-Oxides Nanotubes-Based Composite Particles Useful for Dye-Removal and Process Thereof", U.S. Patent No. 10,661,265 (Granted on 26-May-2020).
- **S.V. Shukla,** H. Padinhattayil, H. Narayani, M. Jose, R. Karunakaran, **"**Semiconductor-Oxides Nanotubes Based Composite Particles Useful for Dye Removal and Process Thereof", Indian Patent No. 370789 (Granted on 30-June-2021); U.S. Patent No. 9,993,814 (Granted on 12-June-2018); Chinese Patent No. 201480002356.7 (Granted on 10-May-2017); Taiwan Patent No. I542564 (Granted on 21-July-2016).
- **S.V. Shukla,** K.G.K. Warrier, B.K. Babu, "A Process for Decomposition of Organic Synthetic-Dyes Using Semiconductor-Oxides Nanotubes via Dark-Catalysis", Indian Patent No. 293723 (Granted on 1-March-2018); Australian Patent No. 2013303756 (Granted on 7-December-2017); Japanese Patent No. (2015-527066 (Granted on 21-July-2017); Chinese Patent No. 104736485B (Granted on 31-May-2017); U.S. Patent No. 9,604,859 (Granted on 28-March-2017); German Patent No. EP2885251 (Granted on 3-August-2016).
- **S.V. Shukla**, K.G.K. Warrier, M.R. Varma, M.T. Lajina, N. Harsha, C.P. Reshmi, "Magnetic Dye-Adsorbent Catalyst", Indian Patent No. 276454 (Granted on 21-October-2016).
- S. Seal, **S.V. Shukla**, L. Ludwig, H.J. Cho, "Fabrication Method for A Room Temperature Hydrogen Sensor", U.S. Patent Number 8,034,650 (Granted on 11-October-2011).
- S. Seal, **S.V. Shukla**, L. Ludwig, H.J. Cho, "Room Temperature Hydrogen Sensor", U.S. Patent Number 7,791,150 (Granted on 7-September-2010).
- S. Seal, **S. Shukla**, "Crystalline Zirconia and Method of Synthesis", U.S. Patent Number 7,758,977 (Granted on 20-July-2010).
- S. Seal, **S. Shukla**, "Synthesis of Tetragonal Phase Stabilized Nano and Submicron Sized Particles", U.S. Patent Number 7,595,036 (Granted on 29-September-2009).
- S. Seal, **S. Shukla**, "Synthesis of Tetragonal Phase Stabilized Nano and Submicron Sized Particles", U.S. Patent Number 7,572,431 (Granted on 11-August-2009).
- S. Seal, **S. Shukla**, "Synthesis of Tetragonal Phase Stabilized Nano and Submicron Sized Particles", U.S. Patent Number 7,288,324 (Granted on 30-October-2007).

PUBLICATIONS (# 87)

(A) PEER REVIEWED JOURNALS (# 82)

ADVANCED OXIDATION PROCESSES (AOPs) / 1-D NANOSTRUCTURES (# 16)

- S. Mohammed, P. Sreelakshmi, D. Devika, R. Roy, **S. Shukla**, "Integration of surface plasmon resonance and photocatalytic activity with Fenton-like advanced oxidation process for effective regeneration of SiO_2-Ag nanocomposite in basic dye removal via adsorption", Chem. Eng. Sci, 2025, 312, 121649 **(IF=4.1)**
- S.M. Mohammed, K. P. Prathish, **S. Shukla**, "Treatment of Aqueous Solution Containing Mixed Binary Reactive Dyes via Integrated Advanced Oxidation Processes Involving Activation of Mixed Binary Oxidants", Desalin. Water Treat. 2024, 319, 100464 **(IF=1.0)**.
- S.M. Mohammed, K. P. Prathish, A. Jeeva, **S. Shukla**, "Integrated Fenton-like and ozonation based advanced oxidation processes for treatment of real-time textile effluent containing azo reactive dyes", Chemosphere 2024, 349, 140766 **(IF=8.1)**.
- S.M. Mohammed, **S. Shukla**, "Regeneration and Recycling of Hydrogen Titanate Nanotubes via Ozonation-based Advanced Oxidation Process as Methylene Blue Adsorbent", Water Air Soil Pollut. 2023, 234, 663 **(IF=3.8)**
- J. Shajeelammal, S. Mohammed, A. Asok, **S. Shukla**, "Removal of Methylene Blue and Azo Reactive Dyes from Aqueous Solution and Textile Effluent via Modified Pulsed Low Frequency Ultrasound Cavitation Process", Environ. Sci. Pollut. Res. 2023, 30, 29258-29280 **(IF=5.8)**
- J. Shajeelammal, S. Mohammed, K. P. Prathish, A,. Jeeva, A. Asok, **S. Shukla**, "Treatment of Real Time Textile Effluent Containing Azo Reactive Dyes via Ozonation, Modified Pulsed Low Frequency Ultrasound Cavitation, and Integrated Reactor", J. Hazard. Mater. Adv. 2022, 7, 100098 **(IF=5.4)**
- S. Mohammed, J. Shajeelammal, A. Asok, **S. Shukla**, "Autoclave and Pulsed Ultrasound Cavitation Based Thermal Activation of Persulfate for Regeneration of Hydrogen Titanate Nanotubes as Recyclable Dye Adsorbent", Environ. Sci. Pollut. Res. 2022, 29, 63304-63320 **(IF=5.8)**
- S. Sriram, F. Ajala, S. Mohammed, A. Asok, **S. Shukla**, "High adsorption and high catalyst regeneration kinetics observed for Flyash-Fe_3O_4-Ag magnetic composite for efficient removal of industrial azo reactive dyes from aqueous solution via persulfate activation", Appl. Surf. Sci. 2021, 548, 149265 **(IF=6.3)**
- H. Narayani, M. Jose, K. Sriram, **S. Shukla**, "Hydrothermal Synthesized Magnetically Separable Mesostructured $H_2Ti_3O_7$/γ-Fe_2O_3 Nanocomposite for Organic Dye Removal via Adsorption and Its Regeneration / Reuse Through Synergistic Non-Radiation Driven H_2O_2 Activation", Environ. Sci. Pollut. Res. 2018, 25, 20304-20319 **(IF=5.8)**.
- M. Jose, K. Sriram, R. Reshma, U. V. Vidya, **S. Shukla**, "Synergistic Persulfate Activation as an Efficient and Cost-Effective Approach for Removal of Organic Synthetic-Dyes from Aqueous Solutions using Magnetic Pd-Fe_3O_4-Flyash Composite Particles as Catalyst", J. Environ. Chem. Eng. 2018, 6, 3709-3717 **(IF=7.4)**.
- H. Narayani, R. Augustine, S. Sumi, M. Jose, K. Deepa Nair, M. Samsuddin, H. Prakash, **S. Shukla**, "Removal of Basic and Industrial Azo Reactive Dyes from Aqueous Solutions via Fenton-Like Reactions using Catalytic Non-Magnetic Pd-Flyash and Magnetic Pd-Fe_3O_4-Flyash Composite Particles", Sep. Purif. Technol. 2017, 172, 338-349 **(IF=8.1)**.
- M. Jose, N. Harsha, K. Suhailath, A. Peer Mohamed, **S. Shukla**, "Hydrogen Phosphate Anions Modified Hydrogen Titanate Nanotubes for Methylene Blue Adsorption from Aqueous Solution: Validating Novel Method of Predicting Adsorption Capacity", J. Environ. Chem. Eng. 2016, 4, 1295-1307 **(IF=7.4)**.
- **S. Shukla** and M.A. Oturan, "Dye Removal using Electrochemistry and Semiconductor Oxides Nanotubes", Environ. Chem. Lett. 2015, 13, 157-172 **(IF=15.0)**.
- M. Jose, M.P. Haridas, **S. Shukla**, "Predicting Dye-Adsorption Capacity of Hydrogen Titanate Nanotubes via One-Step Dye-Removal Method of Novel Chemically-Activated

Catalytic Process Conducted in Dark", J. Environ. Chem. Eng. 2014, 2, 1980-1988 **(IF=7.4)**.

- B.K. Babu, K.G.K. Warrier, **S. Shukla**, "Decolorization of Aqueous Solution Containing Organic Synthetic-Dye via Dark-Catalysis Process using Hydrothermally Synthesized Semiconductor-Oxides Nanotubes", Adv. Sci. Eng. Med. 2014, 6, 173-183 **(IF=Not Available)**.
- H. Narayani, H. Arayapurath, **S. Shukla**, "Using Fenton-Reaction as a Novel Approach to Enhance the Photocatalytic Activity of TiO_2-γ-Fe_2O_3 Magnetic Photocatalyst undergoing Photo-Dissolution Process without Silica Interlayer", Catal. Lett. 2013, 143, 807-816 **(IF=2.3)**.

ADSORPTION & AOPs / 1-D NANOSTRUCTURES (# 14)

- M. Jose, P.T. Aswathi, K. Sriram, P. Parakh, H. Prakash, **S. Shukla**, "Ion-Exchange Bonded $H_2Ti_3O_7$ Nanosheets-Based Magnetic Nanocomposite for Dye Removal via Adsorption and Its Regeneration via Synergistic Activation of Persulfate", RSC Adv. 2016, 6, 80133–80144 **(IF=3.9)**.
- N. Harsha, K.V. Swathi Krishna, N.K. Renuka, **S. Shukla,** "Facile Synthesis of γ-Fe_2O_3 Nanoparticles Integrated $H_2Ti_3O_7$ Nanotubes Structure as a Magnetically Recyclable Dye-Removal Catalyst", RSC Adv. 2015, 5, 30354-30362 **(IF=3.9)**.
- M. Jose, M. Kumari, R. Karunakaran, **S. Shukla**, ""Methylene Blue Adsorption from Aqueous Solutions using Undoped and Silver-Doped Nanotubes of Anatase-Titania Synthesized via Modified Hydrothermal Method", J. Sol-Gel Sci. Technol. 2015, 75, 541-550 **(IF=2.3)**.
- H. Padinhattayil, R. Augustine, **S. Shukla**, "Dye-Adsorption Capacity of High Surface-Area Hydrogen Titanate Nanosheets Processed via Modified Hydrothermal Method", J. Nanosci. Nanotechnol. 2013, 13, 3035-3045 **(IF=1.354)**.
- B.K. Babu, J.V. Purayil, H. Padinhattayil, **S. Shukla**, K.G.K. Warrier, "Silica-Based NTPC-Fly Ash for Dye-Removal Application and Effect of Its Modification", Int. J. Appl. Ceram. Technol. 2013, 10, 186–201 **(IF=1.8)**.
- H. Narayani, S.P. Kunniveetil, **S. Shukla**, "Effect of Solution-pH on Methylene Blue Dye-Adsorption on Hydrogen Titanate Nanotubes Processed via Hydrothermal Method", Adv. Sci. Eng. Med. 2013, 5, 63-72 **(IF=Not Available)**.
- P. Hareesh, K.B. Babitha, **S. Shukla**, "Processing Fly Ash Stabilized Hydrogen Titanate Nano-Sheets for Industrial Dye-Removal Application", J. Hazard. Mater. 2012, 229-230, 177-182 **(IF=12.2)**.
- N. Harsha, K.B. Babitha, **S. Shukla**, K.G.K. Warrier, "Comparing Effects of Silver and Iron Deposition on Dye-Adsorption in Dark Using Anatase-Titania Nanotubes Catalyst", Nanosci. Nanotechnol. Lett. 2011, 3, 809-814 **(IF=1.128)**.
- N. Harsha, R. Priya, K.R. Ranya, **S. Shukla**, S. Biju, M.L.P. Reddy, K.G.K. Warrier, "Morphology-Dependent Correlation between Photoluminescence and Photocatalytic Activity of Anatase-Titania Photocatalyst", Nanosci. Nanotechnol. Lett. 2011, 3, 503-508 **(IF=1.128)**.
- N. Harsha, R. Ranya, **S. Shukla**, S. Biju, M.L.P. Reddy, K.G.K. Warrier, "Effect of Silver and Palladium on Dye-Removal Characteristics of Anatase-Titania Nanotubes", J. Nanosci. Nanotechnol. 2011, 11, 2440-2449 **(IF=1.354)**.
- N. Harsha, K.R. Ranya, K.B. Babitha, **S. Shukla**, S. Biju, M.L.P. Reddy, K.G.K. Warrier, "Hydrothermal Processing of Hydrogen Titanate / Anatase-Titania Nanotubes and Their Application as Strong Dye-Adsorbents", J. Nanosci. Nanotechnol. 2011, 11, 1175-1187 **(IF=1.354)**.
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- **S. Shukla**, M.T. Lajina, Harsha N., Babitha K.B., “Novel Magnetic Dye-Adsorbent Catalyst”, (Oral Presentation) In: International Conference on Nano Science and Technology (ICONSAT-2012), International Advanced Research Center (ARCI) for Powder Metallurgy and New Materials, Hyderabad, India, 20-23 January 2012.
- **S. Shukla**, “Processing, Characterization, and Application of Magnetic Dye-Adsorbent Catalyst”, (Invited Oral Presentation) In: National Seminar on Current Trends in Chemistry (CTriC-2012), Department of Applied Chemistry, Cochin University of Science and Technology (CUSAT), Cochin, Kerala, India, 20-21 January 2012.
- N. Harsha, P.K. Shyama, **S. Shukla**, “Hydrothermally Processed Hydrogen Titanate Nano-Tubes and Their Dye-Adsorption Capacity”, (Poster Presentation) In: National Seminar on Current Trends in Chemistry (CTriC-2012), Department of Applied Chemistry, Cochin University of Science and Technology (CUSAT), Cochin, Kerala, India, 20-21 January 2012.
- P. Hareesh, K.B. Babitha, **S. Shukla**, “Processing Hydrogen Titanate Nano-Sheets via Novel Approach for Industrial Dye-Removal Application”, (Poster Presentation) In: National Seminar on Current Trends in Chemistry (CTriC-2012), Department of Applied Chemistry, Cochin University of Science and Technology (CUSAT), Cochin, Kerala, India, 20-21 January 2012.
- **S. Shukla,** “Dye-Adsorption Capacity of Silica-Based NTPC-Flyash”, (Oral Presentation) In: Platinum Jubilee Session of Indian Ceramic Society (InCerS), Agra, Uttar Pradesh, India 20-22 December 2011.
- Harsha N., Shyama P.K., Babitha K.B., **S. Shukla**, “Dye-Adsorption Characteristics of Hydrogen Titanate and Anatase-Titania Nanotubes”, (Poster Presentation) In: Platinum

Jubilee Session of Indian Ceramic Society (InCerS), Agra, Uttar Pradesh, India 20-22 December 2011 **(Best Poster Award)**.

- Manu J., Remya K., **S. Shukla**, "Processing Ag-Doped Hydrogen Titanate Nanotubes and Their Dye-Adsorption Capacity", (Poster Presentation) In: Platinum Jubilee Session of Indian Ceramic Society (InCerS), Agra, Uttar Pradesh, India 20-22 December 2011.
- Hareesh P., Harsha N., **S. Shukla**, "Surface Modifications and Treatments of NTPC-Flyash for Manufacturing Dye-Adsorbent", (Poster Presentation) In: Platinum Jubilee Session of Indian Ceramic Society (InCerS), Agra, Uttar Pradesh, India 20-22 December 2011.
- K.B. Babitha, K.B. Jaimy, **S. Shukla**, K.G.K. Warrier, "Dye-Removal Characteristics of Hydrothermally Processed Hydrogen Titanate and Anatase-Titania Nanotubes", (Oral Presentation) In: National Seminar on Current Trends in Chemistry (CTriC-2011), Department of Applied Chemistry, Cochin University of Science and Technology (CUSAT), Cochin, Kerala, India, 04-05 March 2011.
- N. Harsha, **S. Shukla**, K.G.K. Warrier, "Pure and Surface Functionalized Hydrothermally Processed Nanotubes of Anatase-Titania as Dye-Adsorbent", (Oral Presentation) In: National Seminar on Current Trends in Chemistry (CTriC-2011), Department of Applied Chemistry, Cochin University of Science and Technology (CUSAT), Cochin, Kerala, India, 04-05 March 2011.
- **S. Shukla**, "High Surface-Area Magnetic Dye-Adsorbent Nanocomposite", (Oral Presentation) In: 3rd Post Doctoral Research Symposium, Argonne National Laboratory, Argonne, Illinois, 08-September-2010.
- **S. Shukla**, M.R. Varma, K.G. Suresh, K.G.K. Warrier, "Magnetic Dye-Adsorbent Catalyst: A "Core-Shell" Nanocomposite", TechConnect Innovation Showcase Exhibition, TechConnect World Summit Conferences and Expo 2010, Anaheim, California, U.S.A., 21-24 June 2010.
- **S. Shukla**, M.R. Varma, K.G. Suresh, K.G.K. Warrier, "Magnetic Dye-Adsorbent Catalyst: A "Core-Shell" Nanocomposite", (Poster Presentation and Article) In: Proceedings of NanoTech Conference and Expo, a Part of TechConnect World Summit Conferences and Expo 2010, Anaheim, California, U.S.A., Vol. 1, pp. 830-833, 21-24 June 2010.
- K.B. Babitha, K.B. Jaimy, S. Anas, **S. Shukla**, K.G.K. Warrier, "Dye-Adsorption Behavior and Photocatalytic Activity of Platinum-Deposited Anatase-Titania and Hydrogen Titanate", (Poster Presentation) In: 73rd Annual Session of the Indian Ceramic Society (InCerS-2010), Thiruvananthapuram, India, 11-12 December 2009.

PHOTOCATALYSIS / 0-D NANOSTRUCTURES (# 9)

- J. Manu, K. Remya, N. Harsha, **S. Shukla**, "Effect of Acid Catalyst on Visible and Ultraviolet Photoactivity of Sol-Gel Derived Silver-Doped Nanocrystalline Anatase-Titania", (Poster Presentation) In: National Seminar on Current Trends in Chemistry (CTriC-2012), Department of Applied Chemistry, Cochin University of Science and Technology (CUSAT), Cochin, Kerala, India, 20-21 January 2012.
- A. Zachariah, K.V. Baiju, **S. Shukla**, K.S. Deepa, J. James, K.G.K. Warrier, "Synergy Effect Induced Enhanced Photocatalytic Activity of Mixed-Phase Nanocrystalline Titania", (Oral Presentation) In: 72nd Annual Session of the Indian Ceramic Society (InCerS-2009), Jaipur, India, 29-30 January 2009.
- R. Priya, K.V. Baiju, **S. Shukla**, S. Biju, M.L.P. Reddy, K.R. Patil, K.G.K. Warrier, "Photocatalytic Activity of Surface-Modified Nanocrystalline Titania under Ultraviolet and Solar Radiations", (Oral Presentation) In: 19th National Symposium on Catalysis (CATSYMP-19), Catalysis for Sustainable Energy and Chemicals, National Chemical Laboratory (NCL), Pune, India, 18-21 January 2009.
- K.V. Baiju, A. Zachariah, **S. Shukla**, K.S. Sandhya, J. James, K.G.K. Warrier, "Photocatalytic Activity of Mesoporous Nanocrystalline Titania Processed via Polymer Modified Sol-Gel", (Poster Presentation, **Selected as the Best Poster**) In: 71st Annual Session of the Indian Ceramic Society (InCerS-2008), 59th Annual Session of All India

Pottery Manufacturers' Association (AIPMA), 33rd Annual Session of Indian Institute of Ceramics, Bangalore, India, 9-11 January 2008.

- K.V. Baiju, **S. Shukla**, K.S. Sandhya, J. James, K.G.K. Warrier, "Photocatalytical Activity of Nanocrystalline Titania Processed via Conventional and Modified Sol-Gel", (Oral Presentation) In: International Conference on Advanced Materials and Composites (ICAMC-2007), Organized by National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram, Kerala, India, 24-26 October 2007.
- K.V. Baiju, **S. Shukla**, K.S. Sandhya, J. James, K.G.K. Warrier, "Photocatalytic Inversion Phenomenon Observed for Sol-Gel Derived Nanocrystalline Titania", (Oral Presentation) In: 10th International Conference on Advanced Materials, Organized by the International Union of Materials Research Societies (IUMRS), Bangalore, India, 8-13 October 2007.
- K.V. Baiju, **S. Shukla**, K.S. Sandhya, J. James, K.G.K. Warrier, "Significance of Crystallinity, Surface Area, and Nanocrystallite Size in Photocatalytic Behavior of Nanocrystalline Titania", (Oral Presentation) In: International Conference on Materials for the Millenium, MatCon 2007, Organized by Cochin University of Science and Technology, Kochi, India, 1-3 March 2007.
- K.V. Baiju, **S. Shukla**, K.S. Sandhya, J. James, K.G.K. Warrier, "Sol-Gel Derived Nanocrystalline Titania Powders as Photocatalysts", (Invited Presentation) In: National Conference on Emerging Trends in Engineering Materials, NCETEM-2007, Organized by School of Physics and Materials Science, Thapar Institute of Engineering and Technology (TIET), Patiala, India, 1-3 February 2007.
- K.V. Baiju, **S. Shukla**, K.S. Sandhya, J. James, K.G.K. Warrier, "Nanocrystalline Titania Powders via Sol-Gel Process for Photocatalytic Application", (Oral Presentation) In: CeraTech 2007, 70th Annual Session of the Indian Ceramic Society, 58th Annual Session of All India Pottery Manufacturers' Association (AIPMA), 32nd Annual Session of Indian Institute of Ceramics, Sponsored by Rashtriya Ispat Nigam Limited - Visakhapatnam Steel Plant and Co-Sponsored by Andhra University, College of Engineering – TEQIP, Andhra University, Visakhapatnam, India, 8-10 January 2007 **(Best Presentation Award)**.

HYDROGEN SENSOR / 2-D NANOSTRUCTURES (# 29)

- **S. Shukla**, "Focused Ion-Beam Milling: A Versatile Technique for TEM Sample Preparation", In: National Conference on Electron Microscopy and XXIX Annual Meeting of Electron Microscope Society of India (EMSI-2007), Organized by EMSI and Department of Physics and Astrophysics, University of Delhi, New Delhi, India, 26-28 November 2007.
- C. Drake, S. Deshpande, **S. Shukla**, D. Bernard, A. Amalu, S. Seal, "Nanocrystalline Doped Tin Oxide for Room Temperature Detection of Hydrogen; Recovery and Response Improvements", (Oral Presentation) Nuclear Engineering Division Program Session, American Institute of Chemical Engineers (AIChE), National Meeting, U.S.A., Spring 2006.
- **S. Shukla**, L. Ludwig, H. Cho, S. Seal, "Room Temperature MEMS-Based Hydrogen Sensor", (Oral Presentation) In: International Workshop on Hydrogen Energy: Production, Storage, and Application, Organized by Center for Non-Conventional Energy Resources, University of Rajasthan, Jaipur, India, Sponsored by Abdus Salam International Center for Theoretical Physics, Trieste, Italy, 5-9 November 2006.
- **S. Shukla**, E. Brinley, H.J. Cho, S. Seal, "Polymer Assisted Synthesis of Ceramic Oxide Nano and Submicron Fibers", (Oral Presentation and Article), 30th Annual Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites, Cocoa Beach, Florida, U.S.A., 2006.
- P. Zhang, **S. Shukla**, L. Ludwig, H.J. Cho, S. Seal, "A Room Temperature Hydrogen Sensor with High Sensitivity and Selectivity using Nanocrystalline Semiconductor Particles", (Oral Presentation and Article) In: Proceedings of IMECE 2005, ASME

International Mechanical Engineering Congress and Exposition, pp. 1-5, IMECE2005-82357, Orlando, Florida, U.S.A., 2005.

- **S. Shukla**, C. Drake, L. Ludwig, H.J. Cho, S. Seal, "Air-Pressure Effect on Room Temperature Hydrogen Sensitivity of Semiconductor Tin Oxide Based Thin Film Micro-Sensor", (Oral Presentation and Article) In: Surface Engineering – Proceedings of the 4th International Surface Engineering Conference, Vol. 2006, pp. 207-213, ASM International Surface Engineering Congress and Exhibition, St. Paul, Minnesota, U.S.A., 2005.
- **S. Shukla**, L. Ludwig, R. Agrawal, H.J. Cho, S. Seal, "Room Temperature Hydrogen Gas Sensitivity of Nanocrystalline Doped-Tin Oxide Sensor Incorporated into MEMS Device", (Oral Presentation and Article) In: Materials Research Society (MRS) Symposium Proceedings, Edited by S. Seal, M. Baraton, N. Muryama, and C. Parish, Vol. 828, pp. 51-57, MRS Proceedings ISBN No. 1-55899-776-8, Semiconductor Oxide Gas Sensing Symposium A, MRS 04, Fall Meeting, Pittsburgh, Pennsylvania, U.S.A., 2005.
- **S. Shukla**, L. Ludwig, S. Seal, "A Novel Theoretical Model for Semiconductor Oxides Gas Sensors", (Oral Presentation and Article) In: Materials Research Society (MRS) Symposium Proceedings, Edited by S. Seal, M. Baraton, N. Muryama, and C. Parish, Vol. 828, pp. 161-166, MRS Proceedings ISBN No. 1-55899-776-8, Semiconductor Oxide Gas Sensing Symposium A, MRS 04 Fall Meeting, Pittsburgh, Pennsylvania, U.S.A., 2005.
- **S. Shukla**, L. Ludwig, R. Agrawal, J. Duarte, H.J. Cho, S. Seal, "Room Temperature Hydrogen Sensitivity of Nanocrystalline Doped Tin Oxide Sensor under UV-Light", (Oral Presentation) Minerals, Metals and Materials (TMS) 134th Annual Meeting and Exhibition, San Francisco, California, U.S.A., 2005.
- **S. Shukla,** S. Seal, "Novel Single Crystal Model for Semiconductor Oxides Thin Film Gas Sensors", (Oral Presentation) Minerals, Metals and Materials (TMS) 134th Annual Meeting and Exhibition, San Francisco, California, U.S.A., 2005.
- **S. Shukla**, R. Agrawal, L. Ludwig, H.J. Cho, S. Seal, "Nano-Micro Integrated Highly Sensitive Room Temperature Hydrogen Detector", (Oral Presentation) Applied Surface Analysis, Annual Joint Symposium of Florida Chapter of the American Vacuum Society (AVS) and Florida Society for Microscopy (FSM), Orlando, Florida, U.S.A., 2005.
- **S. Shukla**, L. Ludwig, R. Agrawal, J. Duarte, H.J. Cho, S. Seal, "Photo-Deactivated Room Temperature Hydrogen Gas Sensitivity of Nanocrystalline Doped-Tin Oxide Sensor", (Oral Presentation and Article) In: Ceramic Engineering and Science Proceedings, Vol. 26, Issue 5, pp. 57-64, 29th Annual Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites, Cocoa Beach, Florida, U.S.A., 2005.
- **S. Shukla,** S. Seal, "Constitutive Equation for Semiconductor Oxides Thin Film Gas Sensors", (Oral Presentation) 29th Annual Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites, Cocoa Beach, Florida, U.S.A., 2005.
- E. Brinley, **S. Shukla,** C. Drake, J. Duarte, S. Deshpande, S. Seal, "FTIR Study of High Surface Area Nanomaterials for Gas Pollution Monitoring", (Best Poster Award) University of Central Florida (UCF) Graduate Forum, Engineering, Optics, Mathematics and Physical Sciences, Simulation and Modeling and other Centers), Orlando, Florida, 22-March-2005.
- **S. Shukla**, L. Ludwig, R. Agrawal, H.J. Cho, S. Seal, "Room Temperature Hydrogen Gas Sensitivity of Nanocrystalline Doped-Tin-Oxide Sensor Incorporated into MEMS Device", (Oral Presentation) Materials Research Society (MRS) Fall Meeting, Boston, Massachusetts, U.S.A., 2004.
- **S. Shukla**, L. Ludwig, S. Seal, "A Novel Theoretical Model for Semiconductor Oxides Gas Sensors", (Oral Presentation) Materials Research Society (MRS) Fall Meeting, Massachusetts, U.S.A., 2004.
- **S. Shukla**, S. Seal, R. Agrawal, J. Duarte, G. Alvero, H.J. Cho, L. Ludwig, C. Parish, M. Meyyappan, "Highly Selective Nano-MEMS Low Temperature Hydrogen Sensor",

(Oral Presentation) NASA Hydrogen Research at Florida Universities-Review Meeting, Florida Solar Energy Center (FSEC), Cocoa, Florida, U.S.A., 2004.

- A. Rajnikant, **S. Shukla**, S. Seal, H.J. Cho, "A Nanoparticle Based Microsensor For Room Temperature Hydrogen Sensor", (Oral Presentation and Article) In: Proceedings of IEEE Sensors, Vol. 1, pp. 395-398, 3rd IEEE Conference on Sensors, Vienna, Austria, 2004.
- S. Seal, **S. Shukla**, R. Agrawal, J. Duarte, G. Alvero, H.J. Cho, L. Ludwig, C. Parish, M. Meyyappan, "Challenges and Solutions For a Room Temperature Hydrogen Sensor Based on Nanotechnology", (Oral Presentation) NASA's Nanotechnology in Space Exploration, National Nanotechnology Initiative (NNI) Grand Challenge Workshop Series, Palo Alto, California, U.S.A., 2004.
- **S. Shukla**, J. Duarte, S. Seal, and C. Parish, "Nanostructured Functional Hydrogen Separation Membrane for Space Applications", (Oral Presentation) Florida Space Grant Consortium (FSGC) STD Awardees Meeting, Center for Space Education, Kennedy Space Center (KSC), Florida, U.S.A., 2004.
- **S. Shukla**, S. Seal, L. Ludwig, C. Parish, "Development of Low Temperature Hydrogen Sensor Based on Nanocrystalline Doped Tin Oxide", (Oral Presentation) Florida Chapter of the American Vacuum Society (AVS) and Florida Society for Microscopy (FSM)-Annual Symposium, Orlando, Florida, U.S.A., 2004.
- **S. Shukla**, S. Seal, L. Ludwig, C. Parish, "Low Temperature Hydrogen Sensing Behavior of Nanocrystalline Doped Tin Oxide Sensor", (Oral Presentation) 28th Annual Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites, Cocoa Beach, Florida, U.S.A., 2004.
- **S. Shukla**, S. Seal, L. Ludwig and C. Parish, "Improved H_2 sensing of Nanocrystalline Doped Tin-Oxide Sensor at Lower Temperature, In: Proceedings of Surface and Interfaces in Nanostructures Materials and 5th Global Innovations Symposium: Trends in LIGA, Miniaturization, and Nano-Scale Materials, MPMD and 5th Global Innovations Proceedings, Warrendale, PA, U.S.A., 2003, ISBN: 0-87339-566-2, 379-381, 2004.
- **S. Shukla**, S. Seal, L. Ludwig, C. Parish, "Modeling and Sensing Hydrogen at Lower Operating Temperatures using Nanocrystalline Tin Oxide Thin Films", (Oral Presentation) 204th Meeting of The Electrochemical Society (ECS), Co-Sponsored in Part by the Electronics Division of The American Ceramic Society, Orlando, Florida, U.S.A., 2003.
- **S. Shukla**, S. Patil, S. Kuiry, S. Seal, L. Ludwig, C. Parish, "Sol-Gel Derived Nanocrystalline Tin Oxide Based Hydrogen Gas Sensor", (Oral Presentation) Minerals, Metals and Materials (TMS) 132nd Annual Meeting and Exhibition, San Diego, California, U.S.A., 2003.
- **S. Shukla**, S. Patil, S. Kuiry, S. Seal, L. Ludwig, C. Parish, "Room Temperature Hydrogen Gas Sensor Based on Nanocrystalline Tin Oxide Thin Film", (Oral Presentation) 27th Annual Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites, Cocoa Beach, Florida, U.S.A., 2003.
- **S. Shukla**, S. Patil, S. Kuiry, S. Seal, Ludwig, C. Parish, "Development of Nanocrystalline Hydrogen Gas Sensors", (Oral Presentation) NASA Hydrogen Research at Florida Universities-Midterm Review Meeting, Tampa, Florida, U.S.A., 2003.
- **S. Shukla**, S. Patil, S. Kuiry, S. Seal, Ludwig, C. Parish, "Room Temperature Hydrogen Gas Sensor Based on Doped Metal Oxide Semiconductor Thin Film", (Poster Presentation) Florida Chapter of the American Vacuum Society (AVS) and Florida Society for Microscopy (FSM)-Annual Symposium, Orlando, Florida, U.S.A., 2003.
- S. Patil, **S. Shukla**, S. Kuiry, L. Ludwig, C. Parish, S. Seal, "Nanocrystalline Oxide Thin Films for Oxygen Sensor", (Poster Presentation, Honorable Mention) Florida Chapter of the American Vacuum Society (AVS) and Florida Society for Microscopy (FSM)-Annual Symposium, Orlando, Florida, U.S.A., 2003.

HYDROGEN SEPARATION MEMBRANE (# 4)

- **S. Shukla**, "Processing Novel Perovskite-Structured Cermet-Based Membranes with Aligned Metal Nanowires: A Feasibility Test", (Invited Poster Presentation) In: 1st Indo-US Research Fellows Conclave, Organized by the Indo-US Science and Technology Forum (IUSSTF) and the Department of Science and Technology (DST), India, Pune, 15-17 March 2013.
- **S. Shukla**, M. Elabaccouch, N. Mohajeri, S. Seal, A.T. Raissi, "Effect of Temperature and Spin-Coating Cycles on Microstructure Evolution of Tb-Substituted $SrCeO_3$ Thin Film Membrane", (Oral Presentation and Article) 30th Annual Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites, Cocoa Beach, Florida, U.S.A., 2006.
- M. Elbaccouch, **S. Shukla**, N. Mohajeri, S. Seal, A.T. Raissi, "Characterization of Spin-Coated Terbium-Doped Strontium Cerate Thin Film Membranes", (Poster Presentation and Article) In: Ceramic Engineering and Science Proceedings, Vol. 26, Issue 3, pp. 219-227, 29th Annual Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites, Cocoa Beach, Florida, U.S.A., 2005.
- J. Duarte, **S. Shukla**, S. Patil, S. Seal, "Microemulsion Derived Nanocrystalline Barium and Strontium Cerate Thin Films and Powders for Gas Sensing Application", (Poster Presentation) Applied Surface Analysis, Annual Joint Symposium of Florida Chapter of the American Vacuum Society (AVS) and Florida Society for Microscopy (FSM), Orlando, Florida, U.S.A., 2005.

PHASE STABILIZATION IN CERAMICS / 0-D NANOSTRUCTURES (# 8)

- **S. Shukla**, S. Seal, "Nanocrystalline Zirconia with Metastable Phase Structure via Modified Sol-Gel", (Oral Presentation) In: CeraTech 2007, 70th Annual Session of the Indian Ceramic Society, 58th Annual Session of All India Pottery Manufacturers' Association (AIPMA), 32nd Annual Session of Indian Institute of Ceramics, Sponsored by Rashtriya Ispat Nigam Limited - Visakhapatnam Steel Plant and Co-Sponsored by Andhra University, College of Engineering – TEQIP, Andhra University, Visakhapatnam, India, 8-10 January 2007.
- V.P. Oleshko, J.M. Howe, **S. Shukla**, S. Seal, "High-Resolution Analytical Electron Microscopy Investigation of Metastable Tetragonal Phase Stabilization in Undoped Sol-Gel Derived Zirconia Nanoceramics", (Poster Presentation and Article) Materials Research Society (MRS) Symposium – Proceedings, Vol. 788, pp. 171-176, MRS Fall Meeting, Boston, Massachusetts, U.S.A., 2003.
- **S. Shukla** and S. Seal, "Metastable-Tetragonal Phase Stabilization in Nanocrystalline and Sub-Micron Sized Undoped Zirconia", (Oral Presentation) 204th Meeting of The Electrochemical Society (ECS), Co-Sponsored in Part by the Electronics Division of The American Ceramic Society, Orlando, Florida, U.S.A., 2003.
- **S. Shukla**, S. Seal, "Synthesis of Sterically Stabilized Zirconia Nanoparticles", (Oral Presentation and Article) In: Proceedings of Minerals, Metals and Materials (TMS) Annual Meeting 2003, Edited by S. Seal, N.B. Dahotre, J. Moore, A. Agarwal, and S. Suryanarayana, pp. 31-40, TMS 132nd Annual Meeting and Exhibition, San Diego, California, U.S.A., 2003.
- S. Seal, **S. Shukla**, R. Viz, S. Bandyopadhya, "TEM, Raman and AFM Studies of Polymer Surfactant Incorporated Ceramic Oxide Nanoparticles", (Oral Presentation) NANO 2002, May 17-21, 2002, Orlando, Florida, U.S.A..
- **S. Shukla**, S. Seal, R. Vanfleet, R. Vij, S. Bandyopadhyay, "Sol-Gel Derived Zirconia Nanoparticles" (Poster Presentation, Honorable Mention) Florida Chapter of the American Vacuum Society (AVS) and Florida Society for Microscopy (FSM)-Annual Symposium, Orlando, Florida, U.S.A., 2002.

- **S. Shukla,** S. Seal, "Sol-Gel Synthesis of Sterically Stabilized Zirconia Ceramic Nanoparticles", (Oral Presentation) 26th Annual International Conference on Advanced Ceramics and Composites, Cocoa Beach, Florida, U.S.A., 2002.
- **S. Shukla**, S. Seal, "Synthesis and Characterization of Nanocrystalline Zirconia Powder by Modified Sol-Gel Technique", (Poster Presentation) Florida Chapter of the American Vacuum Society (AVS) and Florida Society for Microscopy (FSM)-Annual Symposium, Orlando, Florida, U.S.A., 2001.

ELECTROLESS METAL COATING OF CERAMIC OXIDES / 2-D NANOSTRUCTURES (# 1)

- **S. Shukla,** S. Seal, "Electroless Technique for Manufacturing Metal-Ceramic Composites for EMI Shielding and Gas Sensor Applications" (Oral Presentation) In: 26th Annual International Conference on Advanced Ceramics and Composites, Cocoa Beach, Florida, U.S.A., 2002.

METAL-METAL SULFIDE PARTICLES / 0-D NANOSTRUCTURES (# 5)

- **S. Shukla,** S. Seal, "Cluster Size Effect Observed for Gold Nanoparticles Synthesized by Sol-Gel Technique as Studied by X-Ray Photoelectron Spectroscopy", (Oral Presentation) American Vacuum Society (AVS) 47th International Symposium, Boston, Massachusetts, U.S.A., 2000.
- **S. Shukla,** S. Seal, "Cluster Size Effect Observed for Gold Nanoparticles Synthesized by Sol-Gel Technique as Studied by X-Ray Photoelectron Spectroscopy", (Poster Presentation) Florida Chapter of the American Vacuum Society (AVS) and Florida Society for Microscopy (FSM)-Annual Symposium, Orlando, Florida, U.S.A., 2000.
- **S. Shukla,** S. Seal, "Application of X-Ray Photoelectron Spectroscopy in Nanotechnology", (Oral Presentation) In Surface Interface Analysis Conference, Milwaukee, Wisconsin, U.S.A., 1999.
- **S. Shukla**, S. Seal, S. Mishra, "Synthesis and Characterization of Silver Sulfide Nanoparticles Containing Sol-Gel Derived HPC-Silica Film for Ion-Selective Electrode Application", (Poster Presentation) Minerals, Metals and Materials (TMS) 128th Annual Meeting and Exhibition, San Diego, California, U.S.A., 1999.
- S. Seal, L. Bracho, **S. Shukla**, J. Morgiel, "Processing and Characterization of HPC-Silica Films Containing Copper Sulfide Nanoparticles", (Poster Presentation) In: American Vacuum Society (AVS) 45th International Symposium, Seattle, Washington, U.S.A., 1998.

INVITED PRESENTATIONS / SEMINARS (# 45)

- **S. Shukla**, "Treatment of Aqueous Solution Containing Mixed Binary Azo Reactive Dyes via Integrated Advanced Oxidation Processes involving Activation of Mixed Binary Oxidants", **Invited Lecture,** In: International Conference on Water: From Pollution to Purification, Organized by the Inter University Instrumentation Centre (IUIC), International Centre for Polar Studies (ICPS), School of Environmental Sciences, Mahatma Gandhi University, Kottayam, Kerala and Society for Environmental Chemistry and Allied Sciences (SECAS), 12-15 December 2024.
- **S. Shukla**, "Textile Wastewater to Clean Water for Green Hydrogen Energy", **Invited Lecture (On-line)** Faculty Development Program (FDP) on Energy, Sustainability, and Climate Resilience in Modern World, Organized by the Department of Electrical and Electronics Engineering, Vidya Academy of Science and Technology - Technical Campus (VAST-TC), Thiruvananthapuram, Kerala, India; Sponsored by All India Council for Technical Education (AICTE) Training and Learning Academy (ATAL), New Delhi, 2-December-2024.

- **S. Shukla**, "Textile Wastewater Treatment via Integrated Advanced Oxidation Processes", **Distinguished Speaker** in the National Seminar on Advanced Oxidation Processes, Organized by the Inter University Instrumentation Centre (IUIC), Mahatma Gandhi University, Kottayam and Society for Environmental Chemistry and Allied Sciences (SECAS), Kerala, 16-17 February 2024.
- **S. Shukla**, "Textile Wastewater Treatment via Advanced Oxidation Processes", **Invited Lecture** in Short Term Training Program (STTP) on "Persistent Organic Pollutants – Continuous, Outrageous, Recalcitrant Neo Contaminants" organized by the Department of Civil Engineering, National Institute of Technology (NIT) Calicut, Kerala, 7-November-2023.
- **S. Shukla**, "Textile wastewater treatment via ozonation pre-treated with ultrasound cavitation and Fenton-like advanced oxidation processes", **Plenary Speaker (Virtual Mode)** in World Congress on Sustainable Waste Management (WC-SWM) held in New York, U.S.A., Organized by the Sustainable Waste Management Event Contact Desk, Conference Series LLC LTD Conferences, London, U.K., 20-21 June 2023.
- **S. Shukla**, "Autoclave and pulsed low frequency ultrasound cavitation based thermal activation of persulfate for regeneration of hydrogen titanate nanotubes as recyclable dye adsorbent", **Distinguished Speaker (Virtual Mode)** in 4th Edition of Advanced Chemistry Word Congress (Adv. Chemistry 2023) held in Barcelona, Spain, Organized by Peers Alley Media, Vancouver BC, Canada, 27-28 March 2023.
- **S. Shukla**, "Haber-Weiss Reaction: A Missing Link In Understanding Ultrasound Cavitation Treatment of Wastewaters Containing Organic Dyes'", Oral Presentation In: International Conference on Water: Pollution to Purification (ICW-2023), Organized by Inter University Instrumentation Centre (IUIC), School of Environmental Sciences, Advanced Centre of Environmental Studies and Sustainable Development (ACESSD), Mahatma Gandhi (M. G.) University, Kottayam, Kerala, and Society of Environmental Chemistry and Allied Sciences (SECAS), 9-12 February 2023.
- **S. Shukla,** "Persulfate Activation using Flyash-Fe_3O_4-Ag/Cu Magnetic Composite Particles for Abatement of Industrial Azo Reactive Dyes from Aqueous Solutions", Oral Presentation (On-line) In: International Conference on Water: From Pollution to Purification (ICW-2020), 12-14 December 2020, Organized by Inter University Instrumentation Centre (IUIC); School of Environmental Sciences; Advanced Centre of Environmental Studies and Sustainable Development (ACESSD); and Society of Environmental Chemistry and Allied Sciences (SECAS) Mahatma Gandhi University, Kottayam, Kerala, India; Mahatma Gandhi (MG) University, Kottayam, Kerala, 13-December-2020.
- **S. Shukla,** "Advanced Oxidation Processes based Hybrid Dark and Solar-stimulated Pre-treatment Ecofriendly Reactors for Nanofiltration of Textile Effluents", Oral Presentation (On-line) In: CSIR Thematic Proposal Presentations to the Subject Expert Committee Members, Ecology, Environment, Earth & Ocean Sciences, and Water (E3OW), Organized by CSIR-NGRI, Hyderabad, 28-May-2020.
- **S. Shukla,** "Dark-Catalytic and Planar Solar-Concentrator Based Reactors for Removal of Organic Pollutants from Textile Effluents", Oral Presentation In: (i) Project Interaction Meeting, 1-June-2020 and (ii) One Day Meet with Industry Partners, 6-March-2020; under DST-TMD(OWUIS) Project Activities, CSIR-NIIST, Thiruvananthapuram.
- **S. Shukla,** "Recent Developments in Advanced Oxidation Processes for Removal of Organic Dyes from Aqueous Solutions", International Workshop on Catalysis and Applications (IWCA-2020), Organized by International and Inter University Centre for Nanoscience and Nanotechnology and School of Pure and Applied Physics Under the SPARC Scheme of MHRD, Government of India, Mahatma Gandhi University, Kottayam, 29-January-2020.
- **S. Shukla** and **A. Adersh,** "Dark-Catalytic and Planar Solar-Concentrator Based Reactors for Removal of Organic Pollutants from Textile Effluents", Proposal Denfense Presentation, Expert Committee Meeting, Organized by DST-Technology Mission Divion

(TMD) / Optimal Water Use in Industrial Sector (OWUIS), Indian Institute of Technology (IIT) Delhi, New Delhi, 23-April-2019.

- **S. Shukla**, "Efficient Electronic and Gas Chromic H_2 and CH_4 Detectors for GAIL (India) Limited", White Paper (Proposal) Defense Presentation, Gas Authority of India Limited (GAIL), New Delhi, 12-March-2019.
- **S. Shukla**, "$H_2Ti_3O_7/\gamma$-Fe_2O_3 Magnetic Nanocomposites for Organic Dye Removal from Aqueous Solutions via Adsorption and Advanced Oxidation Process", 3rd International Conference on Nanomaterials: Synthesis, Characterization and Application (ICN 2018), Jointly Organized by International and Inter University Centre for Nanoscience and Nanotechnology (IIUCNN), Mahatma Gandhi University, Kottayam, Kerala, India; Mahatma Gandhi (M. G.) University, Kottayam, Kerala, India; Department of International Exchanges & Cooperation, Beijing University of Chemical Technology, P. R. China; Gdansk University of Technology, Department of Polymer Technology, Poland; M. G. University, Kottayam, Kerala, India; 11-13 May 2018.
- **S. Shukla**, "Magnetic Nanocomposites for Removal of Organic Synthetic-Dyes from Aqueous Solutions and Industry Wastewaters via Dark-Catalysis", One Day Golden Jubilee National Seminar on "Nanomaterials for Energy, Environment and Health (NEEH-2018), Organized by Department of Nanoscience and Technology, University of Calicut, Kozhikode, Kerala, 16-March-2018.
- **S. Shukla,** "Catalytic Non-Magnetic Pd-Flyash and Magnetic Pd-Fe_3O_4-Flyash Composite Particles for Removal of Basic and Industrial Azo Reactive Dyes from Aqueous Solutions via Fenton-Like Reactions", One Day International Symposium on "Frontiers of Advanced Materials and their Applications – FAMA'2018", Organized by the Department of Chemistry, Bishop Heber College (Autonomous), Tiruchirappalli, Tamil Nadu, India, 9-January-2018.
- **S. Shukla,** "Removal of Organic Synthetic-Dyes from Aqueous Solution using H_2TiO_3/γ-Fe_2O_3 Magnetic Nanocomposites via Integrated Adsorption / Advanced Oxidation Processes", 3rd National Conference on Advanced Oxidation Processes (AOP-2017), Organized by the Department of Chemistry, Bharathidasan Institute of Technology (BIT Campus), Anna University, Tiruchirappalli, Tamil Nadu, in association with the Society of Environmental Chemistry and Allied Sciences (SECAS), 17-19 December-2017.
- **S. Shukla,** "Recent Developments in Organic Dye Removal from Aqueous Solutions and Industry Wastewaters", Inter-Disciplinary Courses in Materials Sciences, Organized by University Grant Commission-Human Resource Development Center (UGC-HRDC), Kannur University Campus, Thavakara, Kerala, 20-July-2017.
- **S. Shukla,** ""Recent Developments in Removal of Organic Dyes from Aqueous Solutions", **Oral Presentation** in **Hindi Language**,", Hindi Week Celebration, CSIR-NIIST, Thiruvananthapuram, 19-September-2016.
- **S. Shukla,** "Dye-Removal from Aqueous Solutions and Industry Effluents via Novel Dark-Catalysis using Nanotubes / Nanosheets / Nanoparticles-Based Adsorbents", Nano Science Advisory Committee (NSAG) Meeting, Nano Mission, Department of Science and Technology (DST), Jawaharlal Nehru Center for Advanced Scientific Research (JNCASR), Bengaluru, India, 17-November-2014.
- **S. Shukla,** "Development of Innovative Methods for Removal of Organic-Synthetic-Dyes from Aqueous Solutions and Industry Effluents", Divisional Meeting, CSIR-NIIST, Thiruvananthapuram, India, 1-August-2014.
- **S. Shukla,** "Nanoparticles Integrated Magnetic Composites and Industrial Application Thereof", Patent Application Review Meeting, CSIR-NIIST, Thiruvananthapuram, India, 1-April-2014.
- **S. Shukla**, "Semiconductor Oxides Nanotubes-Based Magnetic / Non-Magnetic Dye-Adsorbent Catalysts", **Keynote Lecture** In: 2nd International Congress on Advanced Materials (AM 2013), Jointly Organized by the Jiangsu University, University of Jinan, State Key Laboratory of Bioreactor Engineering, and Hengyang Normal University,

P.R. China; Jiangsu University, Zhenjiang, Jiangsu Province, P.R. China, 16-19 May 2013.

- **S. Shukla,** "Dark-Catalysis: Novel Approach For Industrial Dye-Removal", CSIR-NIIST, Colloquium Series, 26-November-2013.
- **S. Shukla,** "Decomposing Dyes and Recycling Dye-Adsorbents via Dark-Catalysis", Patent Application Review Meeting, CSIR-NIIST, Thiruvananthapuram, India, 3-April-2012.
- **S. Shukla,** "Development of Magnetic Dye-Adsorbent Catalyst", Indian Academy of Sciences, Bangalore, 29-September-2011.
- **S. Shukla,** "Magnetic Dye-Adsorbent Catalyst", Patent Application Review Meeting, CSIR-NIIST, Thiruvananthapuram, India, 24-July-2009.
- **S. Shukla,** "One- and Three-Dimensional Nano-Titania as Photocatalyst", Invited Presentation in National Seminar on "Recent Trends in Chemistry (RTC-3)", Organized by the Jayaraj Annapackiam College for Women (Autonomous), Periyakulam, Tamil Nadu, Sponsored by Council of Scientific and Industrial Research (CSIR), New Delhi, India, 26-February-2009.
- **S. Shukla,** "Smart Ceramic Oxides for Gas Leak Detection and Dye Removal From Industrial Waste Water", Invited Presentation in "Smart Materials – Opportunities and Challenges", a Short Term Course for Engineering College Teachers, Organized by Government College of Engineering (GEC), Barton Hill, Thiruvananthapuram, India, 13-January-2009.
- **S. Shukla,** "Semiconductor Nanocrystalline Titania as Photocatalyst", National Seminar on Special Purpose, Strategic and Futuristic Materials for High Technology Sectors, organized by Indian Institute of Metals (IIM), Thiruvananthapuram, Kerala Chapter, 16-17 October 2008.
- **S. Shukla**, "High-Lights of My Research Activities", Invited Presentation (for Winning CSIR Young Scientist Award in Engineering Sciences 2008), [1]Third Research Council Meeting, National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), 18-September-2008; [2]National Chemical Laboratory (NCL-CSIR), Pune, 9-September-2008.
- **S. Shukla**, "Enhanced Photocatalytic Activity of Mixed-Phase Nanocrystalline Titania as a Synergy Effect" in National Seminar entitled "Aryabhateeya 2008" organized by Swadeshi Science Movement, Kerala Chapter of Vijnana Bharati, Thiruvananthapuram, 5-6 September 2008.
- **S. Shukla**, "Novel Membrane Materials and Methods for Separating Hydrogen", Invited Presentation, Proposal Review Meeting, CSIR Head Quarters, New Delhi, 20-March-2008.
- **S. Shukla**, "Photocatalytic Activity of Single and Mixed Phase Titania", Invited Presentation, Central Glass and Ceramic Research Institute (CGCRI), Kolkata, 13-February-2008.
- **S. Shukla,** "Sol-Gel Derived Nanocrystalline Titania as a Photocatalyst", [1]Invited Presentation, National Chemical Laboratory (NCL), Pune, India, May 18, 2007; [2]Invited Presentation, In: National Seminar on Current Trends in Materials Research, Department of Physics, Scott Christian College, Nagercoil, Tamil Nadu, 15-16 February 2007.
- **S. Shukla**, "MEMS-Based Hydrogen Detector", Invited Presentation, Liquid Propulsion System Center (LPSC), Indian Space Research Organization (ISRO), Mahendragiri, Tamil Nadu, India, 2006.
- **S. Shukla**, "Room Temperature Hydrogen Detection Using Nano-Micro Integrated Sensor", Invited Presentation, [1]Vikram Sarabai Space Center (VSSC), Indian Space Research Organization (ISRO), Thiruvananthapuram, Kerala, India, 2006; [2]Regional Research Laboratory (RRL), Council of Scientific and Industrial Research (CSIR), Thiruvananthapuram, Kerala, India, 2006.
- **S. Shukla**, "Nano-Scaled Materials", Invited Presentation, [1]National Seminar on Nanotechnology, Sponsored by University Grants Commission (UGC), Organized by

Departments of Physics and Chemistry, All Saints' College, Thiruvananthapuram, Kerala, India, September 2006, [2]CSIR Program on Faculty Training and Motivation, Regional Research Laboratory (RRL), Thiruvananthapuram, Kerala, India, 2006.

- **S. Shukla**, "Relevance of Organic Polymer in Synthesizing Nano Ceramic and Semiconductor Oxides", Invited Presentation, Annual Day Celebration, Materials Research Society of India (MRSI), Thiruvananthapuram Chapter, India, 7-July-2006.
- **S. Shukla**, "Sol-Gel Derived Nanocrystalline Oxides: Properties and Applications", Invited Presentation, Indian Institute of Science (IISc), Bangalore, Karnataka, India, 2003
- S. Seal, **S. Shukla**, V.P. Oleshko, J.M. Howe, "Phase Stabilization in Nanophase Zirconia", NN 2003, Crete, Greece, August 2003.
- **S. Shukla**, "Sol-Gel Synthesis of Sterically Stabilized Nanocrystalline Zirconia and Its Phase Evolution Behavior", Seminar, University of Central Florida (UCF), Orlando, Florida, U.S.A., 2001.
- **S. Shukla**, "Electroless Metals Coating of Ceramic Substrates", Invited Presentation, Indian Institute of Technology (IIT), Mumbai, India, 2000.
- **S. Shukla**, "Synthesis and Characterization of Sulfide and Metal Nanoparticles Dispersed in Hydroxypropyl Cellulose-Silica Films", Invited Presentation, National Chemical Laboratory (NCL), Pune, India, 2000.
- **S. Shukla**, "Computer Simulation Study: Nanoparticles Synthesis by Microemulsion Technique", Seminar, University of Central Florida (UCF), Orlando, Florida, U.S.A., 2000.
- **S. Shukla,** "Grain Size Dependence of Structural and Thermal Characteristics of Nanocrystalline Gold Studied by X-Ray Diffraction", Seminar, University of Central Florida (UCF), Orlando, Florida, U.S.A., 1999.
- **S. Shukla,** "Dynamic Recrystallization", Seminar, Indian Institute of Technology (IIT), Mumbai, India, 1996.
- **S. Shukla,** "Diffusion Bonding of Al and Al-Alloys", Seminar, Indian Institute of Technology (IIT), Mumbai, India, 1995.

REVIEWERSHIP (# 38)

- ACS Applied Materials and Interfaces
- ACS Omega
- Applied Catalysis A
- Applied Catalysis B
- Applied Surface Science
- Australian Journal of Chemistry
- Catalysis Today
- Chemical Communication
- Chemical Engineering Journal
- Conference Proceedings (30th Annual Cocoa Beach Conference and Exposition on Advanced Ceramics and Composites, Cocoa Beach, Florida, U.S.A., 2006)
- Current Nanoscience
- Electrochimica Acta
- Environmental Science and Technology
- Environmental Technology
- Industrial and Engineering Chemistry Research
- IEEE Sensor Journal
- Indian Journal of Applied Physics
- Journal of Catalysis
- Journal of Environmental Chemical Engineering
- Journal of Environmental Management
- Journal of Hazardous Materials

- Journal of Industrial and Engineering Chemistry
- Journal of Materials Chemistry A
- Journal of Materials Engineering and Performance
- Journal of Nanomaterials and Molecular Nanotechnology
- Journal of Sol-Gel Science and Technology
- Journal of Solid State Chemistry
- Journal of the Taiwan Institute of Chemical Engineers
- Langmuir
- Materials Research Bulletin
- Materials Science and Engineering B
- RSC Advances
- Science of Advanced Materials
- Sensors and Actuators B
- Sustainable Environment Research
- Synthetic Metals
- The Journal of Physical Chemistry C
- Water Resources and Industry

MEMBERSHIP / LIFE MEMBERSHIPS (# 8)

- **American Chemical Society (ACS)** (2015-2018)
- **Indian Ceramic Society (InCerS)** (Membership # SL-198; Since 2007)
- **Electron Microscope Society of India (EMSI)** (Membership # LM-388; Since 28-November-2007))
- **Materials Research Society of India (MRSI)** (Membership # LM B 1180; Since 23-June-2009)
- **Indian Institute of Ceramics (IICeram)** (Membership # Not Available; Since 19-September-2009)
- **Indian Institute of Metals (IIM)** (Membership # TO2-LM-46722; Since 31-March-2011)
- **Society of Environmental Chemistry and Allied Sciences (SECAS)** (Membership # 130; Since 8-October-2012)
- **Academy of Microscope Science and Technology (AMST)** (Membership # LM-0065; Since 2013)

PAST STUDENTS

- **Ph.D.**

  (1) Manu Jose
  Academy of Scientific and Innovative Research (AcSIR)
  Thesis Title: Titania, Titanate, and Flyash Based Nanostructures and Nanocomposites for Organic Dye Removal from Aqueous Solutions
  Thesis Defended On: 26-July-2017
  Present Status: Joined the Post-Doctoral Position at West Pomeranian University of Technology Szczecin, Poland under the OPUS Project Financed by National Science Centre (NCN), Poland.

  (2) Harsha Narayani
  Academy of Scientific and Innovative Research (AcSIR)
  Thesis Title: Magnetic Nanocomposites for Organic Dye Removal from Aqueous Solutions
  Thesis Defended On: 6-February-201

- **M.Sc. / *M. Tech.**

(1) Avishna S.
Kannur University (March-May 2024)
Thesis: Regeneration of Hydrogen Titanate Nanotubes via Persulfate based Advanced Oxidation Process Integrated with Photocatalytic Activity

(2) Sreelaksmi P.
Kannur University (January-April 2023)
Thesis: Regeneration of SiO2/Ag/Ag2O Nanocomposite particles based dye Adsorbent via Combination of Surface Plasmon Resonance and Advanced Oxidation Process under Solar and Visible Light Irradiation

(3) Devika D.
University of Kerala (April-July 2022)
Thesis: Removal of Methylene Blue Dye from Aqueous Solution by using Plasmonic Resonance of Silver Nanoparticles Supported on Nano-Silica under Solar and Visible Irradiation

(4) Pavithra S.K. (April-July 2022)
University of Kerala
Thesis: Advanced Oxidation Processes for Decomposition of Solid Sludge Formed via Herbal Treatment of Textile Effluent

(5) Sandhya P.
Calicut University (April-June 2019)
Thesis: Visible-light Induced Photocatalytic Activity of Silver-deposited Nanocrystalline Anatase Titania

(6) Sruthi E.
Kannur University (January-May 2018)
Thesis Title: Mechanism of Regenration of Magnetic/Non-Magnetic Mixed Hydrogen Titanate/Anatase-Titania Nanotubes in Organic Dye Removal Application via Fenton-Like Activation

(7) Lekshmi S.K.
University of Kerala (April-June 2018)
Thesis Title: Regeneration and Recycling of Hydrothermal Synthesized Hydrogen Titanate Nanotubes in Dye-Removal Application using Persulfate as Oxidant

(8) Athira M.
University of Calicult (April-June 2018)
Thesis Title: Application of Peroxymonosulfate as Oxidant in Dye-Removal Application for Regeneration and Recycling of Hydrothermal Synthesized Hydrogen Titanate Nanotubes

(9) Sooryamol T.S.
University of Calicut (April-June 2017)
Thesis Title: Removal of Methylene Blue and Azo Reactive Dyes from Aqueous Solutions via Advanced Oxidation Process involving Anodized Titania and Flyash-Fe_3O_4-Ag as Catalyst

(10) Revathy R.
University of Kerala (April-June 2017)
Thesis Title: Industrial Dye Removal from Aqueous Solution via Advanced Oxidation Process using Anodized CuO-ZnO and Flyash-Fe_3O_4-Cu Magnetic Nanocomposite

(11) Anusree K.
Kannur University (January-April 2017)
Thesis Title: Industrial Dye-Removal from Aqueous Solution via Adsorption and Advanced Oxidation Process using Flyash-Fe_3O_4-Magnetic Nanocomposite Synthesized via Inverse Co-Precipitation Technique

(12) Reshma R.
University of Kerala (April-July 2016)
Thesis Title: Dye-Removal using Activated Carbon and Fe_3O_4/Oxidized Activated Carbon Magnetic Nanocomposite

(13) Vidya U.V.
University of Kerala (April-July 2016)
Thesis Title: Dye-Removal using Activated Carbon and Pd/Oxidized Activated Carbon Nanocomposite

(14) Anjana V.L.
University of Kerala (April-July 2015)
Thesis Title: Degradation of Methylene Blue Dye in Aqueous Solution via In-Situ Generation of Hydrogen Peroxide using Palladium / Flyash Composite

(15) Aswathi P.T.
Cochin University of Science and Technology (CUSAT) (January-May 2015)
Thesis Title: Synthesis of γ-Fe_2O_3 Nanoparticles Integrated Hydrogen Titanate Nano-Sheets as a Magnetically Separable Dye-Removal Catalyst

(16) Swathi Krishna K.V.
Mahatma Gandhi (M.G.) University (January-May 2014)
Thesis Title: Development of Self-Integrated γ-Fe_2O_3/$H_2Ti_3O_7$ Nano-Structures and Their Dye-Adsorption Characteristics

(17) *Rimesh A.
Cochin University of Science and Technology (July-2012 to June-2013)
Thesis Title: Dye-Adsorption Capacity of Hydrogen Titanate Nanosheets and Industrial Dye-Removal using Micro-Nano Integrated Flyash-Based Composite

(18) *Manoj P.H.
Cochin University of Science and Technology (July-2012 to June-2013)
Thesis Title: Dye Removal Using Hydrothermally Processed Hydrogen Titanate Nanotubes Derived From Sol-Gel Anatase-TiO_2 Precursor

(19) Sumi S.
University of Kerala (March-May 2013)
Thesis Title: Surface-Modification of flyash Using Magnetite via Reverse Co-Precipitation Method

(20) Suhailath K.
Calicut University (March-May 2013)
Thesis Title: Effect of Solution-pH on Methylene Blue Dye Adsorption using Phosphate Modified Hydrogen Titanate Nanotubes Processed via Hydrothermal Method

(21) Mahitha Kumari K.
Kannur University (January-March 2013)
Thesis Title: Dye-Removal Using Hydrothermally Synthesized Anatase-TiO_2-Based Dye-Adsorbents

(22) Hajara A.
Kannur University (January-May 2012)
Thesis Title: Synthesis and Characterization of Titania/Iron Oxide and Titania/Silica/Iron Oxide Magnetic Photocatalysts and Their Photocatalytic Activity

(23) Shyama P.K.
Kannur University (January-May, 2011)
Thesis Title: Hydrogen Titanate Nanotubes via Hydrothermal and Their Dye-Adsorption Capacity

(24) Jeena V.P
University of Kerala (January-May, 2011)
Thesis Title: Determination of Dye-Adsorption Characteristics of Fly Ash

(25) *Babitha K.B.
Cochin University of Science and Technology (July-2009 to June-2010)
Thesis Title: Dye-Removal Characteristics of Nanocrystalline Particles and Nanotubes of Anatase-Titania and Hydrogen Titanate

(26) Ranya K.R.
University of Calicut (April-June 2009)
Thesis Title: Photocatalytic Activity of Surface-Functionalized Hydrothermal Processed Anatase-Titania Nanotubes

(27) Rakhi T.G.
University of Calicut (April-June 2009)
Thesis Title: Dye-Adsorption Using Hydrothermal Processed Titania-Coated Silica-Cobalt Ferrite Composite Particles

(28) Harsha N.
Kannur University (January-April, 2009)
Thesis Title: Surface-Functionalized Hydrothermal Processed Nanotubes of Anatase Titania as Dye-Adsorbent

(29) Lajina M.T.
Kannur University (January-April, 2009)
Thesis Title: Processing Titania/Silica/Cobalt Ferrite Nanocomposite as a Magnetic Dye-Adsorbent Catalyst

(30) Shijitha T.
Kannur University (January-April, 2008)
Thesis Title: Electroless Copper Coating of Flyash using Titania Photocatalyst as a Surface-Sensitizer

(31) Priya R.
Kannur University (January-April, 2008)
Thesis Title: Photocatalytic Activity of Surface-Modified Sol-Gel Titania

- **Project Assistant (PA) / Project Associate-I (PA-I) / Junior Research Fellow (JRF)**

  (1) Riona Roy (PA-I, January-2024 to March-2025)

  (2) Megha T. Kuriakose (PA-I, January-October 2023)

  (3) Jishnu Thomas (PA-I, August-December 2022)

  (4) Shajeelammal J. (PA, December-2019 to March-2022)

  (5) Sreeram K. (PA, April-2016 to March-2017)

  (6) Hareesh P. (PA, June-2011 to September-2012)

  (7) Remya K. (JRF, January-May, 2011)

- **International**

  (1) Faten Ajala (November-2016 to April-2017)
  Country: Tunisia, Africa
  Program: CSIR-TWAS Sandwich Post-Graduate Fellowship

COURSES OFFERED UNDER ACADEMY OF SCIENTIFIC AND INDUSTRIAL RESEARCH (AcSIR)

- Advanced Materials Science (Full Course)
- Advanced Materials Characterization (In Part)
- Advanced Materials Processing (In Part)

AWARDS / HONOURS

- Recognized as an **Outstanding Reviewer** by the **Editors, RSC Advances, 2018**.
- Joined New RSC Advances **Reviewer Panel**, 2015.
- **Recognized Reviewer Status,** Awarded by the Elsevier, Amsterdam, The Netherlands, February 2014.
- **Keynote Lecture,** presented in 2nd International Congress on Advanced Materials (AM 2013), Jointly Organized by the Jiangsu University, University of Jinan, State Key Laboratory of Bioreactor Engineering, and Hengyang Normal University, P.R. China; Jiangsu University, Zhenjiang, Jiangsu Province, P.R. China, 16-19 May 2013.
- **Selected in Top 60 Innovations/Technologies,** by the DST-Lockheed Martin India Innovation Growth Program, 2010.
- **India-US Science and Technology Forum (IUSSTF) Research Fellowship Award,** Engineering Sciences, 2009
- **CSIR Young Scientist Award,** Engineering Sciences, 2008.
- **Best Poster Award,** in 71st Annual Session of the Indian Ceramic Society (InCerS-2008), 59th Annual Session of All India Pottery Manufacturers' Association (AIPMA), 33rd Annual Session of Indian Institute of Ceramics, Bangalore, India, 9-11 January 2008.
- **Best Presentation Award,** in 70th Annual Session of the Indian Ceramic Society (InCerS-2008), 58th Annual Session of All India Pottery Manufacturers' Association (AIPMA), 32rd Annual Session of Indian Institute of Ceramics, Visakhapatnam, India, 8-10 January 2007.
- **As a Session Chair,** in [1]National Seminar on Current Trends in Chemistry (CTriC-2011), organized by the Department of Applied Chemistry, Cochin University of Science and Technology (CUSAT), Cochin, Kerala, India, March 04-05 2011; [2]National Conference on Emerging Trends in Engineering Materials, NCETEM-2007, Organized by School of

Physics and Materials Science, Thapar University, Patiala, India, 1-3 February 2007; [3]Applied Surface Analysis, Annual Joint Symposium of Florida Chapter of the American Vacuum Society (AVS) and Florida Society for Microscopy (FSM), Orlando, Florida, U.S.A. 2005; [4]Materials Research Society (MRS) Conference, Fall Meeting, Boston, Massachusetts, 2004.

- **Honorary Award ($700.00),** for Review Article, International Materials Reviews (IMR), 2005.
- **Honorable Mention,** for Poster Presentation, Florida Chapter of the American Vacuum Society and Florida Society for Microscopy-Annual Symposium, Orlando, Florida, U.S.A., 2002.
- **Dorothy-Hoffman Award,** AVS 47th International Symposium, Boston, Massachusetts, U.S.A., 2001.
- **Graduate Student Award,** University of Central Florida (UCF), Orlando, Florida, U.S.A., 2001.
- **Certificate of Recognition,** for Volunteer Work in Surface Analysis Conference, Wisconsin, Milwaukee, U.S.A., 1999.

OTHER ACTIVITIES

- Nominated by the Director, CSIR-NIIST to attend the 2nd International Conference on Green Hydrogen (ICGH-2024) organized by the Ministry of Natural and Renewable Energy (MNRE) and Office of the Principal Scientific Advisor (PSA) in association with the Ministry of Petroleum and Natural Gas (MPNG) in association with the Department of Science and Technology (DST), and Department of Scientific and Industrial Research (DSIR), India, Bharat Mandapam, New Delhi, 11-13 September 2024.
- Acted as a Chair in a session of National Seminar on Advanced Oxidation Processes" Organized by the Inter University Instrumentation Centre (IUIC), Mahatma Gandhi University, Kottayam and Society for Environmental Chemistry and Allied Sciences (SECAS), Kerala, 16-17 February 2024.
- Served as an Expert Committee Member for the selection of Post Doctoral Candidates under the Chief Minister's Nava Kerala Post-Doctoral Fellowships (CM-NK-PDF) for the Inter University Instrumentation Centre (IUIC) at the Mahatma Gandhi (MG) University, Kottayam, Kerala, 29-November-2023.
- Participated on One-Week-One-Lab (OWOL) Program organized by CSIR-NIIST during 13-18 March 2023 as the member of Feedback Committee under the General Committee.
- Acted as a Chair in a session of an International Conference on Water: Pollution to Purification (ICW-2023), Organized by Inter University Instrumentation Centre (IUIC), School of Environmental Sciences, Advanced Centre of Environmental Studies and Sustainable Development (ACESSD), Mahatma Gandhi (M. G.) University, Kottayam, Kerala, and Society of Environmental Chemistry and Allied Sciences (SECAS), 9-12 February 2023.
- Attended one-day Workshop on the Hydrogen Valley in Kerala at the Mascot Hotel, Thiruvananthapuram on 15-February-2023 organized by the Indian Institute of Technology (IIT) Palakkad, Kerala in collaboration with the Department of Science and Technology (DST), New Delhi, India.
- Conducted 6 hour on-line course, entitled "Removal of organic dyes from aqueous solutions and textile wastewaters", under the Skill Development Program organized by CSIR-NIIST, 4-5 July 2022.
- Organized the guest lecture by Prof. B. Neppolian, Dean (Research), SRM Institute of Science and Technology, Chennai at CSIR-NIIST, 27-May-2022.
- Conducted 6 hour on-line course, entitled "Removal of organic dyes from aqueous solutions and textile wastewaters", under the Skill Development Program organized by CSIR-NIIST, 21-22 October 2021.

- Served as a Micro-observer in the Votes Counting of Kerala State Legislative Assembly Elections, for the Vamanpuram Constituency, held at the Mar Ivanois College, Thiruvananthapuram, Kerala, 2-May-2021.
- Served as a Presiding Officer in the Kerala State Legislative Assembly Elections, for the Parasala Constituency, held at the LMS UPS (North Portion) Perimbakonam Polling Station, Kerala, 6-April-2021.
- Visited Kerala Industrial Infrastructure Development Corporation (KINFRA), Kannur on 23-January-2020.
- Served as Convener for Organizing 8^{3rd} Annual Session of Indian Ceramic Society (InCerS) entitled "National Conference on **In**novations and **Te**chnologies for **C**eramics (InTeC-2019)" which was held during 11-12 December 2019 at CSIR-NIIST, Thiruvananthapuram.

  Description: The National Conference (InTeC-2019) was organized by the InCerS-KC in association with CSIR-NIIST, Thiruvananthapuram, during 11-12 December 2019, as the part of 83rd Annual Session of InCerS. The objective of the Annual Session was to provide a common forum and an opportunity for a large number of delegates, working in the various fields related to ceramics, glass, refractories, and allied materials to exchange and intake ("InTeC") the enriched thoughts and ideas. Dr. V. K. Dadhwal, Director, Indian Institute of Space Science and Technology (IIST), Thiruvananthapuram was the Chief Guest during the Inaugural Session of the National Conference. The annual event brought together around 200 delegates, involving the young researchers, scientists, and industrialists to discuss and exchange innovations and technologies, thus creating an environment for collaborative endeavors in multi as well as interdisciplinary areas related to ceramics. About 100 participants from various parts of India presented results from their respective areas, explaining new findings and discussing future R&D strategies. There were 2 Memorial Lectures, 2 Plenary Lectures, 5 Keynote Lectures, 8 Invited Lectures, 1 Special Lecture, 7 Contributed Lectures, 6 Students' Lectures, and 68 Poster Presentations. Total 6 best presentations awards (which included cash prize, certificate, and memento) were provided for the Students' Lecture and Poster Sessions. Some of the well established ceramic industries put up the exhibition stalls to display their traditional as well as advanced ceramic products during the National Conference. The ceramics fraternity honored Dr. K.G.K. Warrier, (Retd.) Chief Scientist and Former Head, Materials Science and Technology Division (MSTD), CSIR-NIIST, on the occasion, for his lifetime work spanning over 41 years in the allied fields. Overall, InTeC-2019 was a highly successful event which was primarily sponsored / supported by the major ceramic industries within India as well as by the Government Organizations such as DRDO and CSIR. **(Total Budget = Indian ₹ 18.00 Lakh)**



- Acted as an Assistant Supervisor for the CSIR-UGC JRF-NET Examination (2019, 2018, 2017 and Before)
- Served as an Organizing Committee Member in the National Conference on Emerging Trends in Science, Technology and Application of Electron Microscope (STAEM - 2018) and 5th Annual Meeting of the Academy of Microscope Science and Technology (AMST), Jointly Organized by CSIR-National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram and Academy of Microscope Science and Technology (AMST) held at CSIR-NIIST, Thiruvananthapuram, 19-21 December 2018.
- Attended One-Day R&D Industry Meet held at CSIR-NIIST, Thiruvananthapuram, 23-February-2018.
- Served as a Technical Committee Member in the National Conference on Luminescence and its Applications (NCLA), Jointly Organized by Luminescence Society of India (LSI) and CSIR-NIIST, held at CSIR-NIIST, Thiruvananthapuram, 14-16 February 2018.
- Served as a member of referee panel for judging the Student Oral Presentation Competition in the 4th International Conference on Advanced Oxidation Processes (AOP-2016), Organized by Birla Institute of Technology and Science (BITS), Pilani, Goa Campus in association with the Society of Environmental Chemistry and Allied Sciences (SECAS), Goa, India, 17-20 December-2016.
- Served as a Micro Observer in the Kerala State Legislative Assembly Elections, for the Attingal Constituency, held at the Vellalloor Polling Station, 16-May-2016.
- Acted as a host for the visit of Dr. Long Lin, Professor and Head, Department of Colour Science, University of Leeds, U.K., 17-18 December 2015.
- Acted as a host for the visit of Dr. Halan Prakash, Associate Professor, Birla Institute of Technology and Science (BITS) – Pilani, Goa Campus, under the Industry Immersion Program of BITS-Pilani, 22-June-2015 to 9-July-2015.
- Member of the Organizing Committee of International Conference on Science, Technology and Applications of Rare Earths (STAR 2015), Organized by Rare Earth Association of India (REAI) in Collaboration with the National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), Thiruvananthapuram, 22-25 April 2015, Thiruvananthapuram, Kerala, India.

- Attended “National Workshop on Engineering Failure Analysis” Organized by The Indian Institute of Metals (IIM), Trivandrum Chapter, National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), Thiruvananthapuram, and Society for Failure Analysis, Hyderabad, 21-March-2015.
- Served as a member of referee panel for judging the Student Oral Presentation Competition in the International Conference on Advanced Oxidation Processes (AOP), Organized by Society of Environmental Chemistry and Allied Sciences (SECAS) and School of Environmental Sciences, Mahatma Gandhi University, Kottayam, Kerala, Munnar, Kerala, 25-28 September 2014.
- Attended an interactive session with H.H. Sri Sri Ravi Shankar entitled “The Convergence – Symbiosis of Traditional and Modernity for Social Engineering” Organized by the Swadeshi Science Movement, Kerala, 10-January-2013.
- Conducted 2 days classes as a part of the course entitled “Introduction to Ceramics Technology” at the Department of Chemical Sciences, Kannur University, Payynur Campus, Kerala for the years 2008, 2009, and 2011.
- Served as a Presiding Officer in the Kerala State Legislative Assembly Elections, for the Nedumangad Constituency, held at the Karichara Polling Station, 13-April-2011.
- Invited Participation in Technology Commercialization Workshop Organized by the Department of Science and Technology (DST), India and Lockheed Martin, U.S.A. India Innovation Growth Program, New Delhi, India, 29-30 March 2010.
- One of the Team Members for Installing the High-Resolution Transmission Electron Microscope (300 kV, Tecnai G^2, FEI Netherlands) at CSIR-NIIST, India.
- Attended One-Day National Seminar on “Nanotechnology – The Technology of the Future”, Sponsored by All India Council for Technical Education (AICTE), New Delhi, Organized by Department of Mechanical Engineering, Government Engineering College, Barton Hill, Thiruvananthapuram, Kerala, India, 28-March-2007.
- Attended One-Day Symposium on “Nanomaterials: Technology, Characterization, and Applications” Organized by Indian Society of Analytical Scientists (ISAS-Kochi Chapter), Cochin, Kerala, India, 9-December-2006.
- Attended the Orientation Course on “Mineral Characterization and Beneficiation Practices”, Organized by Regional Research Laboratory (RRL), Bhubaneswar, Orissa, India, and Indian Institute of Mineral Engineers (IIME), India, 23-28 October 2006.