

Nitin Machchhindra

Flat No.-101, Manas Darshan, Sector-8, Khanda Colony, New Panvel(W), India

Mob: +91 9833061410

Skype: nitinmk26

Email: nitinmk80@gmail.com/nitinmk26@rediffmail.com

DOB: 26/08/1980

PROFILE:

- Extensive research on metal, semiconductor, insulator.
- Extensive experience with high vacuum systems & deposition methodologies (e.g. PVD(Sputter, Evaporation & Co-evaporation), Sol-gel, Polymer derived Coatings)
- **Experience of designing, modeling and characterizing optical system or devices (2D structure).**
- **Good hand on various surface sciences characterization techniques includes optical Microscopy, scanning electron microscope (SEM), Scanning probe Microscopy (AFM), XPS, Ellipsometry fluorescence Spectroscopy etc.**
- LASER Material interaction system (Pump probe technique) Indigenous development.
- **Ability to analyze and interpret data, test results and use them to improve products and methodologies (simulation work i.e. Fitting, Optimization).**
- Experience in high temperature protection coatings(Corrosion resistance coatings), including development/preparation of feedstock materials, production of coatings and investigations of coating properties

PROFESSIONAL EXPERIENCE:

Autonomous University of Madrid, (CSIC), Madrid

Aug 2018 – Aug 2020

**Alexander Dubček University of
Trenčín, Slovakia**

Researcher

Extensive work on environmental barrier coatings for protection of metallic substrates using polymer derived ceramic (PDC)coatings

Amity University, Mumbai, India

Feb 2015 – July 2018

Assistant Professor

Practical's, Projects, theory lectures

ASHAPURA MINECHEM LTD., Mumbai, India

March 2014 – Dec 2014

Senior R&D Executive (Analytical)

Involved with the analytical characterization of various mining products used in paper, oil and color industries and analyze and interpret data, test results and use them to improve products and methodologies

D. J. SANGHVEE COLLEGE, Mumbai, India

July 2013 – March 2014

Assistant Professor

Lab Practical's, Projects, theory lectures

BHABHA ATOMIC RESEARCH CENTRE, Mumbai, *Jun 2011 – Dec 2012*
India

Research Scholar

- Design, development and characterization of composite thin films by PVD techniques for optical coating applications
- Setting up of laser material interaction facility at BARC, Mumbai.
- Handled responsibilities related to design, development and characterization of various optical devices such as high reflecting mirrors, beam splitters, narrow band filters, beam combiners, anti-reflecting coatings etc.

Research Achievements:

Educational Credentials:

- M. Sc. (Physics) University of Mumbai (2003) 1st Class
- B. Sc. (Physics) University of Mumbai (2001) 1st Class

Ph. D., (Material Science) Physics – Dec. 2012, Bhabha Atomic Research Center (University of Mumbai)

Dissertation Title: “Engineered oxide composite thin films for optical coating applications”

Research Outcome: Design, development and Characterizations of interference modulated optical multilayer devices and thin films.

Publications:

Scientific Journals: 13 (Contribution: Planning & executions of experimental work, most of the characterization of samples)

National/international Conferences: 23 (Contribution: Planning & executions of experimental work, most of the characterization of samples)

International Project:

Researcher, HORIZON 2020, WIDESPREAD-01-2016-2017-TeamingPhase2, Centre for functional and surface-functionalized glasses, 3/2017 – 2/2024.

SKILLS:

OPERATIONAL PROFICIENCY AND SKILLS ON INSTRUMENTS

- ✓ Familiar with design, development and characterization of optical thin films.
- ✓ Fine hand in characterization techniques, like

- Spectroscopic techniques like UV-visible Spectrophotometer, ellipsometer, and Grazing incidence Reflectometer, Fourier Transform Infrared Spectroscopy (FTIR), Micro Raman Spectroscopy
- Microstructure and Morphology characterization by grazing incidence X-ray reflectivity (GiXR), atomic force microscopy (AFM), Scanning Electron Microscopy (SEM)
- Compositional characterization by Energy Dispersive X-ray Spectroscopy (EDXS), X-Ray Photoelectron Spectroscopy (XPS).
- Laser Induced Damage Studies (LiDT).
- Expertise in handling of XRD, XRF
- Expertise in processing, analyzing and interpreting the spectroscopic data to understand optical, morphological, structural properties of optical thin films.

ADDITIONAL SKILLS

Well versed with Windows operating system. Familiar with software like MS office, Adobe Acrobat, C/C++ scientific programming etc. Expertise in handling optical thin film related software, like TFCal., Ellipsometer Software, GiXR Software, AFM Software, XPS related software XPS PEAK-FIT, Origin, etc.

Postdoctoral Work:

Due to the increasing costs for metals, there is currently a need to enhance the performance and lifetime of steel, for example, those employed in exhaust systems, waste incineration plants, metal or glass casting and forming or for applications in the chemical industry. Recently polymer derived ceramics (PDCs) have gained attention. PDC exhibits a relatively low-cost and easy approach to produce polymeric and ceramic coatings. The coatings are mainly based on silicon containing precursors. These coatings combine the processing ease of polymer derived ceramics and the favorable properties of the resulting ceramics like thermal stability, thermal shock resistance, high temperature strength or oxidation and corrosion resistance. In the present study, a novel environmental barrier coating system for steel consisting of a perhydropolysilazane (PHPS) bond coat and a polysilazane-based glass/ceramic composite top coat has been developed. After stabilizing the coating slurries, double layers were applied on mild and stainless steel substrates by the dip-coating technique. Parameters like pre-treatment of the steel substrates, filler systems, and particle size of the fillers or coating thickness were varied to optimize the coatings. The thermal treatment was performed in air at temperatures up to 1000 °C. A uniform, well adherent, dense and crack-free coating system with a noteworthy thickness up to few μm was achieved. Even after cyclic oxidation tests on coated samples at 1000 °C the coating system was still undamaged and no oxidation occurred on the mild steel substrates.

REFERENCES

Prof. I. M. Dharmadasa
Head of Electronic Materials & Sensors
Group

Materials and Engineering Research Institute
Sheffield Hallam University, United
Kingdom

E-mail: dharme@shu.ac.uk

Tel: +44 (0)114 225 6910

Fax: +44 (0)114 225 6930

Dr. Vivek Parkar,
Scientific Officer, Nuclear Physics Division,

Bhabha Atomic Research Centre,
Trombay, Mumbai – 400085, INDIA

E-mail: parkarvivek@gmail.com

Ph.(Office): +912225596783

Mob: +919869744403

Dr. Shirish Chodankar
Physicist,

National Synchrotron Light Source II
Brookhaven National Laboratory,
Upton, NY 11973

E-mail: schodankar@bnl.gov

Tel: 631 344 2731

Dr. R. R. Deshmukh
Professor, Registrar

Institute of Chemical Technology Matunga,
Mumbai-400 019, India

E-mail: rajedeshmukh@rediffmail.com

Tel: +919960588675

Dr. Akshat Shetty,
Core Labs,
Qatar environment & Energy research institute (QEERI),
Doha, Qatar
E-mail: akshathshetty@gmail.com
Mobile: +97466431719

Selected Publications:

- I. NM Kamble, RB Tokas, A Biswas, S Thakur, D Bhattacharyya, NK Sahoo. Determination of the optical constants of $\text{HfO}_2\text{-SiO}_2$ composite thin films through reverse fitting of transmission spectra, Vacuum, 2011, 86, p422-428.
- II. NC Das, NK Sahoo, D Bhattacharya, S Thakur, NM Kamble, D Nanda, S Hazra, JK Bal, JF Lee, YL Tai, CA Hsieh. Correlation between local structure and refractive index of e-beam evaporated ($\text{HfO}_2\text{-SiO}_2$) composite thin films, J. Appl. Phys, 2010, 108, p023515-1.
- III. PR Sagdeo, DD Shinde, JS Misal, NM Kamble, RB Tokas, A Biswas, AK Poswal, S Thakur, D Bhattacharya, NK Sahoo, SC Sabharwal. Deposition and characterization of titania-silica optical multilayers by asymmetric bipolar pulsed dc sputtering of oxide target, J. Phys. D: Appl. Phys, 2010, 43, p045302.
- IV. S Jena, RB Tokas, NM Kamble, S Thakur, NK Sahoo. Optical properties and laser damage resistance of $\text{HfO}_2\text{-SiO}_2$ mixed composite thin films, Applied Optics, 2014, 53, p850-860.

"I hereby declare that the details furnished above are true and correct to the best of my knowledge."

Yours Sincerely,
Nitin M Kamble