PROFORMA FOR BIO-DATA

1**. Name and full correspondence address**: Dr. Satish Anandrao Mahadik,

Department of Physics, Sanjay Ghodawat University, Kolhapur, India.

2. **Email(s) and contact number(s):** satish.mahadik@sanjayghodawatuniversity.ac.in, Superhydrophobicmaterial2100@gmail.com

+919822946226.

3. **Institution:** Sanjay Ghodawat University, Kolhapur.

4**. Gender:** Male

5. **Category:** General

6**. Academic Qualification**

S. No.	Degree	Year	Subject	University/Institution	% of marks
1	B.Sc.	2005	Physics	Shivaji University Kolhapur.	69 %
2	M.Sc.	2008	Physics	Shivaji University Kolhapur.	61 %
3	Ph.D	2012	Physics	Shivaji University Kolhapur.	-

7. Ph.D thesis title:

SYNTHESIS AND CHARACTERIZATION OF TRANSPARENT SUPERHYDROPHOBIC SILICA THIN FILM USING SPIN, DIP AND SPRAY COATINGS.

Guide Name: Prof: A. Venkateswara Rao.

Department of physics Shivaji university Kolhapur

Year of Award. 14 May 2012.

***8. Research Interest:**

- Development of Functional nano materials for Agriculture Application
- Multifunctional Superhydrophobic Sol-Gel Coating
- Silica aerogels for insulating applications
- Anticorrosion and antibacterial Coatings

9. Work experience

S. No.	Positions held	Name of the Institute	From	To
1	University teaching assistant	Department of physics, Shivaji university Kolhapur	2008	2013
2	Post-doctorate researcher (Erasmus mundus European commission, Brussels)	LASIE laboratory (CNRS), la Rochelle university, la Rochelle, France.	2013	2014
3	Assistant professor	Adarsh Institute of Technology & Research Centre Vita.	2015	2016
4	Post-doctoral researcher –	University of Seoul, Seoul south Korea.	2017	2018
5	Assistant professor	Krishna mahavidyalaya Rethare, Shivaji university Kolhapur.	2019	2021
6	Assistant Professor	Sanjay Ghodawat University, Kolhapur.	2021	Still date

10. Professional Recognition/ Award/ Prize/ Certificate, Fellowship received by the applicant.

S. No.	Positions held	Name of the Institute
1	Post-doctorate fellowship (selected)	Université du Québec à Chicoutimi, Qubec, Canada (2019)
2	Post-Doctorate Fellowship (UOS, south korea)	University of Seoul, Seoul, South Korea. (2017-18)
3	Post-Doctorate (Erasmus Mundus Post Doctorate fellow – European	LaSIE Laboratory (CNRS) La Rochelle University, La Rochelle, France. (2013-14)

	Commission)	
4	Research Fellowship in Sciences for Meritorious Students – (UGC New Delhi, India)	Department of physics, Shivaji University, Kolhapur. -416004, India. (2008-2012)

11. Publications

S. No.	Author(s)	Title	Name of Journal	Volume	Page	Year
1	**Satish A. Mahadik,** Sonkawade, RG. Fernando PD	Enhancing photoelectrochemical performance through surface engineering of CdSe and Al-doped CdSe nanoparticles on ZnO/FTO photoanodes	International Journal of Hydrogen Energy (**IF:7.2**)	51	676-689	2024
2	**Satish A. Mahadik,** Thakur S, Fernando P D	Designing polyaniline films with tailored thermal, optical, and hydrophobic properties via gold nanoparticle integration	Journal of Industrial and Engineering Chemistry (**IF:6.1**)	130	382-391	2024
3	**Satish A. Mahadik,** Mahadik SS	Surface properties of chlorophyll-sensitized TiO_2 nanorods for dye-sensitized solar cells applications.	Colloid and Interface Science Communications Volume, (**IF:4.91**)	46	100558	2022
4	**Satish A. Mahadik,** Mahadik SS	Surface morphological and topographical analysis of multifunctional	Ceramic International (**IF: 5.2**)	47(20)	29475-29482	15 2021

		superhydrophobic sol-gel coatings				
5	**Satish A. Mahadik**, Mahadik SS	Surface morphological and topographical analysis of multifunctional superhydrophobic sol-gel coatings	Ceramic International (**IF:5.2**)	47(20)	29475-29482	15 2021
6	Relekar BP, **Mahadik SA**, Jadhav ST,	Effect of Electrodeposition Potential on Surface Free Energy and Supercapacitance of MnO2 Thin Films	J Electron Mater. (**IF:2.52**)	47(5)	2731-1-8	2018
7	Gawali SA, **Mahadik SA**, Pedraza F, Pathan HM, Jadkar SR.	Synthesis of zinc oxide nanorods from chemical bath deposition at different pH solutions and impact on their surface properties	J Alloys Compd. (**IF: 6.67**)	704	788-1-7	2017
8	**Mahadik SA**, Pedraza F, Mahadik SS.	Comparative studies on water repellent coatings prepared by spin coating and spray coating methods	Prog Org Coatings (**IF: 7.01**)	104	217-1-6	2017
9	**Mahadik SA**, Pedraza F, Mahadik SS.	Biocompatible superhydrophobic coating material for biomedical applications. .	J Sol-Gel Sci Technol. **(IF: 2.6**)	81(3)	791-1-6	2017
10	**Mahadik**	Synthesis and	J Sol-Gel Sci	78(3)	475-	2016

	SA, Pedraza FD, Parale VG,	characterization of superhydrophobic–superoleophilic surface.	Technol. (**IF: 2.6**)		1-7	
11	Mahadik DB, **Mahadik SA**, Park H-H.	Monolithic and shrinkage-free hydrophobic silica aerogels via new rapid supercritical extraction process.	J Supercrit Fluids. (**IF: 3.9**)	107	84-1-8	2016
12	**Mahadik SA,** Pedraza F, Vhatkar RS	Silica based superhydrophobic coating for long-term industrial and domestic applications.	J Alloys Compd. (**IF: 6.371**)	663	487-1-7	2016
13	**S.A. Mahadik**, F.D. Pedraza,	Synthesis and characterization of superhydrophobic–superoleophilic surface,	J Sol-Gel Sci Technol. (**IF: 2.6**)	78	475-1-7	2016
14	**Mahadik SA**, Pedraza F, Parale VG, Park H-H	Organically modified silica aerogel with different functional silylating agents and effect on their physico-chemical properties.	J Non Cryst Solids. (**IF: 3.81**)	453	164-1-8	2016
15	Pedraza F, **Mahadik SA**, Bouchaud B.	Synthesis of ceria based superhydrophobic coating on Ni20Cr substrate via cathodic electrodeposition.	Phys Chem Chem Phys. (**IF: 3.95**)	17(47)	31750-1-8	2015
16	**Mahadik**	Recoverable and	J Sol-Gel Sci	62(3)	490-	2012

	SA, Rao AV	thermally stable superhydrophobic silica coating.	Technol. (**IF: 2.6**)		1-5	
17	**Mahadik SA**, Fernando PD, Wagh PB,	Durability and restoring of superhydrophobic properties in silica-based coatings.	J Colloid Interface Sci.(**IF: 9.9**)	405	262-1-7	2013
18	**Mahadik SA**, Vhatkar RS	Superhydrophobic silica coating by dip coating method	Applied Surface Science (**IF: 7.15**)	277	67-1-6	2013
19	Parale VG, Kavale MS, **Mahadik SA**, Rao AV, Mullens S.	Sol-gel preparation of PTMS modified hydrophobic and transparent silica coatings.	J Porous Mater. (**IF: 2.52**)	20(4)	733-1-7	2013
20	Parale VG, **Mahadik SA**.	OTES modified transparent dip coated silica coatings.	Ceram Int. (**IF: 5.2**)	39(1)	835-1-6	2013
21	Parale VG, **Mahadik SA**, Kavale MS, Rao AV,	Wettability study of surface modified silica aerogels with different silylating agents.	J Sol-Gel Sci Technol. (**IF: 2.6**)	63(3)	573-1-6	2012
22	**Mahadik SA**, Mahadik DB, Kavale MS.	Thermally stable and transparent superhydrophobic sol-gel coatings by spray method	J Sol-Gel Sci Technol. (**IF: 2.6**)	63(3)	580–586	2012

23	Kavale MS, **Mahadik SA**, Mahadik DB,	Enrichment in hydrophobicity and scratch resistant properties of silica films on glass by grafted microporosity of the network.	J Sol-Gel Sci Technol (**IF: 2.6**)	64(1)	9–16	2012
24	Ganbavle V V,, **Mahadik SA**, Rao A.V.	Self-cleaning silica coatings on glass by single step sol–gel route	Surface and Coatings Technology (**IF: 5.6**)	205(23-24)	5338-1	2011
25	Rao A.V, **Mahadik, S A** Charles Kappenstein	Mechanically stable and corrosion resistant superhydrophobic sol–gel coatings on copper substrate	Applied Surface Science (**IF: 7.15**)	257(13)	5772-1	2011
26	**Mahadik SA**, Mukherjee SK, Rao A V.	Transparent superhydrophobic silica coatings on glass by sol-gel method	Applied Surface Science (**IF: 7.15**)	257(2)	333-1	2010

12. Research project

S. No.	Title of Project	Source of Funds	Amount	Duration
1	Development of Superhydrophobic coating for anti-corrosion Applications	Sanjay Ghodawat University, Kolhapur	1,50,000	2023-24
2	Development of Climate-Proof Superhydrophobic Sol-Gel Coating for Hygienic Public Health in India	BIRAC, India With Global Co- PI Prof. Fernando PEDRAZA, France.	8000000	Under review

3	Development of Durable, Transparent Epoxy-nano Portable Spray for Robust Superhydrophobic Auto Parts Application	Bharat seats polymer tech grants , venture center, Pune	900000	Under review
4	Bharat seats polymer tech fellows	Venture center, Pune	100000	Submitted

13. Books/Reports/Chapters/General articles etc.

S. No.	Title	Author's name	Publisher	Year of Publication
1	Sol-Gel based Superhydrophobic Multifunctional Coatings and its Tribological Properties	Satish.A. Mahadik, F. Pedraza, Sarika. S. Mahadik	Tribology in Coatings and Surface Treatment: Technology, Properties, and Applications, IGI Global, an international publisher of progressive academic research. DOI: 10.4018/978-1-7998-9683-8.ch012	2022

14. Any other Information (maximum 500 words)

(1) Research Accomplishments:

My scientific research began in material science during my studies toward a Master of Science degree and Ph.D at Shivaji University Kolhapur where I was a UGC Meritorious fellow in 2006-2012. I studied the sol-gel formulation of ORMOSIL, with the goal of superhydrophobic coating for various industrial applications. Sol-gel formulations of ORMOSIL based coatings to provide multifunctionality have been successfully extrapolated to self-cleaning with long-term durability, anti-corrosion, mechanical robustness, scratch resistance, reversible superhydrophobicity, transparency, superhydrophobicity-superoleophobicity, acid resistance, photocatalytic self-cleaning, bio-compatibility, superoleophobicity, thermal stability at higher temperatures (300-1200

°C). These coatings are mostly based on ORMOSIL based materials, and inorganic compound including ZnO, CeO_2, TiO_2, they deposited with different methods including spray, spin, dip, layer by layer depositions, Chemical bath deposition, & electro-chemical deposition. The superhydrophobicity and multi-functionalities they confer has been clearly described in our previous publications. Their dual scale morphology makes them susceptible to superhydrophobicity. However, fundamental results have shown the great dependency on the surface engineering that result in multifunctionality of the surfaces as shown in fig.1 below.

All above novel results were developed in co-operation with various leading international and national reputed institutes including Shivaji University, Kolhapur, India, University of La Rochelle, France, BARC, Mumbai, India, University of Seoul, Yonsei University, Seoul, Korea, University of Poitiers, Poitiers, France, Flemish Institute for Technological Research, Boeretang, Belgium, NCL, Pune, CSIR- National Aerospace laboratory, Bangalore, India, GSSC, Savitribai Phule Pune University, Pune, Bursa Technical University, Turkey and AITRC, India have been further explored during 2008-2019 by developing a systematic study on the Multifunctional Coatings. However, the influence of outdoor conditions, corrosion, mechanical damage, acid resistance on the final properties of these superhydrophobic coatings shall be studied as they have been shown to change both the chemical composition and the microstructure of the coatings. More precisely, the goal is to correlate the chemical composition/ microstructure /morphology/wettability/ surface roughness with surface energy properties to provide “lotus effect” to the Multifunctional Coatings in the presence of organic or inorganic contents.

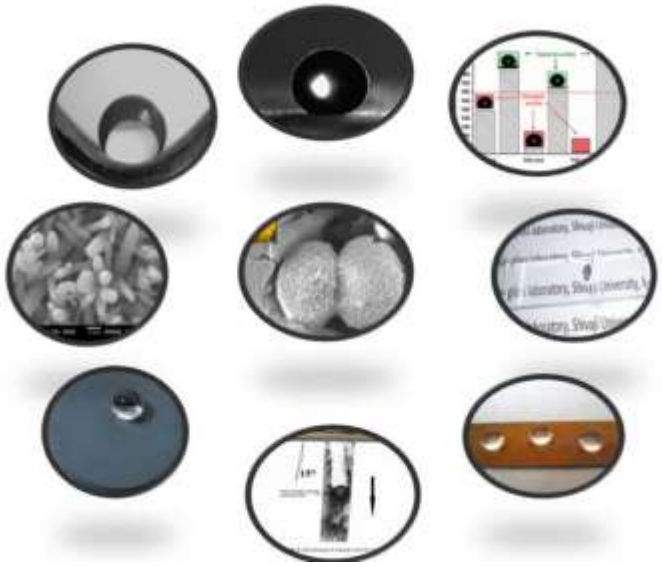

Fig.1 Some our exciting results on Multifunctional Coatings

Nanostructured materials have been developed for various applications including superhydrophobic silica aerogels for insulation and addressing oil spills, as well as photo-catalytic coatings for volatile organic compound degradation and supercapacitors. Sol-gel-based nanostructured ORMOSIL materials with multifunctional properties could potentially serve as anti-corrosion coatings for diverse substrates. However, detailed exploration of such coatings is limited. The aim is to understand how to customize compositions and microstructures of multifunctional coatings for effective corrosion protection.