# Dr. Prvan Kumar Katiyar



***PhD (IIT- Kanpur, Materials Science & Engineering)***
Date of Birth: April 15, 1989
Citizenship: Indian
Email ID: prvan26350@gmail.com
Contact number: +91-7652029017
***Research area:*** *Heat treatment, Microstructures, Corrosion, Coatings, Electrometallurgy, Extractive metallurgy*

## EDUCATION

28/06/2019-25/12/2013: **Research Scholar**, Department of Materials Science & Engineering, Indian Institute of Technology, Kanpur (India).

***Research Area:***

- Corrosion analysis of reinforced steel bar in concrete and simulated solution.
- Comparative corrosion behavior of different steel microstructures.
- Effect of different cooling rates on the corrosion behavior of high carbon pearlitic steel (Rail steel).
- Corrosion behavior of annealed steels with different carbon contents (0.002% C, 0.17% C, 0.43% C, and 0.7% C) and their corrosion mechanisms.
- PhD Thesis: "***Comparative corrosion behavior of carbon steels with varying composition and microstructures in and outside concrete***".
  Year of Awarded: (June 28, 2019)

07/2011-08/2013: **Master in Technology,** (Metallurgical Engineering) in Extractive Metallurgy from Centre of Advanced Studies, Indian Institute of Technology (BHU), Varanasi.

***Research Area:***

- Anodic dissolution behavior of tungsten carbide scraps in ammoniacal media and deposition of Cobalt.
- Modes of failure of cemented tungsten carbide tool bits (WC/Co): A study of wear parts.
- Corrosion behavior of WC-Co tool bits in simulated solutions.
- Master's Thesis "***Electrochemical dissolution of tungsten and cobalt from waste tungsten carbide material***".

07/2006-05/2010: **Bachelor in Technology,** Materials Science & Metallurgical Engineering, University Institute of Technology, Kanpur, India

***Research Area:***

- Mixed ionic and electronic conducting material".

## PUBLICATIONS

1. **Prvan Kumar Katiyar**, A comprehensive review on synergy effect between corrosion and wear of cemented tungsten carbide tool bits: A mechanistic approach, Published in International Journal of Refractory Metals and Hard Materials. https://doi.org/10.1016/j.ijrmhm.2020.105315.

2. **Prvan Kumar Katiyar**, B. Bhushan, and K. Mondal, Relook at the mechanisms of spheroidization of 0.7 wt% C steel by potentiodynamic polarization, Metallography, Microstructure, and Analysis 2019**,** https://doi.org/10.1007/s13632-019-00588-3-3.

3. **Prvan Kumar Katiyar**, P K Behera, Sudhir Misra, and K. Mondal, Comparative corrosion behavior of five different microstructures of rebar steels in simulated concrete pore solution with and without chloride addition, Journal of Materials Engineering and Performance, Volume 28, Issue 10, pp 6275-6286, 2019, https://doi.org/10.1007/s11665-019-04339-x,

4. **Prvan Kumar Katiyar**, Sudhir Misra, and K. Mondal, Corrosion behavior of annealed steels with different carbon contents (0.002%, 0.17%, 0.43%, and 0.7% C) in freely aerated 3.5% NaCl solution, Published in Journal of Materials Engineering and Performance, Volume 28, Issue 7, pp, 2019, https://doi.org/10.1007/s11665-019-04137-5.

5. **Prvan Kumar Katiyar**, P K Behera, Sudhir Misra, and K. Mondal, Effect of Microstructures on the Corrosion Behavior of Reinforcing Bars (Rebar) Embedded in Concrete, Published in Metals and Materials International, Volume 25, Issue 5, pp 1209-1226, 2019, https://doi.org/10.1007/s12540-019-00288-1.

6. **Prvan Kumar Katiyar**, Sudhir Misra, and K. Mondal, Comparative Corrosion Behavior of Five Microstructures (Pearlite, Bainite, Spheroidized, Martensite, and Tempered Martensite) Made from a High Carbon Steel, Published in Metallurgical and Materials Transactions A, Volume 50, Issue 3, pp 1489-1501, 2019, https://doi.org/10.1007/s11661-018-5086-1.

7. **Prvan Kumar Katiyar**, Sudhir Misra, and K. Mondal, Effect of different cooling rates on the corrosion behavior of high carbon pearlitic steel, Published in Journal of Materials Engineering and Performance Volume 27, Issue 4, pp 1753-1762, 2017, https://doi.org/10.1007/s11665-018-3256-3.

8. **Prvan Kumar Katiyar**, N. S. Randhawa, Corrosion behavior of WC-Co tool bits in simulated (concrete, soil, and mine) solutions with and without chloride additions, Published in International Journal of Refractory Metals and Hard Materials Volume 85, December 2019, pp 1050-1062. https://doi.org/10.1016/j.ijrmhm.2019.105062.

9. **Prvan Kumar Katiyar**, P. K. Singh, R. Singh, A. lava Kumar, Modes of failure of cemented tungsten carbide tool bits (WC/Co): A study of wear parts. Published in International Journal of Refractory Metals and Hard Materials, Volume 54, January 2016, pp 27-38, https://doi.org/10.1016/j.ijrmhm.2015.06.018.

10. **Prvan Kumar Katiyar**, N. S. Randhawa, A comprehensive review on recycling methods for cemented tungsten carbide scraps highlighting the electrochemical techniques, International Journal of Refractory Metals & Hard Materials Volume,90, 2020, 105251, https://doi.org/10.1016/j.ijrmhm.2020.105251

11. **Prvan Kumar Katiyar**, N. S. Randhawa, J. Hait, R. K. Jana, K. K. Singh and T. R. Mankhand Presented a paper on "Anodic dissolution behaviour of tungsten carbide scraps in ammoniacal media" Advanced Materials Research**,** 828, 2014, pp 11-20**.** https://doi.org/10.4028/www.scientific.net/AMR.828.11

12. Neetu , **Prvan Kumar Katiyar** , S. Sangal , K. Mondal, Effect of various phase fraction of bainite, intercritical ferrite, retained austenite and pearlite on the corrosion behavior of multiphase steels, Corrosion Science, 2020.

13. P K Behera, **Prvan Kumar Katiyar**, Sudhir Misra, and K. Mondal Effect of Pre-induced Plastic Strains on the Corrosion Behavior of Reinforcing Bar in 3.5 pct NaCl Solution. Metall Mater Trans A (2021). https://doi.org/10.1007/s11661-020-06088-2

14. Abdul Rahim Siddiqui, Rita Maurya, **Prvan Kumar Katiyar**, Kantesh Balani, Superhydrophobic, self-cleaning carbon nanofiber CVD coating for corrosion protection of AISI 1020 steel and AZ31 magnesium alloys, Surface and Coatings Technology, 2020.

15. N. S. Randhawa and **Prvan Kumar Katiyar,** Potentiodynamic polarization behavior and microscopic examination of tungsten carbide hard metal materials in supported ammoniacal medium, Portugaliae Electrochimica Acta, volume 38(3), 2018, , pp 185-200, https://doi.org/10.4152/pea.202003185.

16. H.S.Maharana, **Prvan Kumar Katiyar,** K Mondal, Structure dependent super-hydrophobic and corrosion resistant behavior of electrodeposited Ni-MoSe2-MWCNT coating, Applied Surface Science, Volume 478, 1 June 2019, pp 26-37, https://doi.org/10.1016/j.apsusc.2019.01.166.

17. Pragya Tripathi, **Prvan Kumar Katiyar**, Janakarajan Ramkumar, Kantesh Balani, Synergistic Role of Carbon Nanotube and Yttria Stabilised Zirconia Reinforcement on Wear and Corrosion Resistance of Cr-Based Nanocomposite Coatings, Surface and Coatings Technology, *SURFCOAT*-D-19-03983, January, 2020, published. https://doi.org/10.1016/j.surfcoat.2020.125381

18. B. Bhushan**, Prvan Kumar Katiyar,** B.S. Murty**,** K. Mondal, Synthesis of Hydrophobic Ni-VN Alloy Powder by Ball Milling, Advanced Powder Technology, Volume 30, Issue 8, August 2019, pp 1600-1610, https://doi.org/10.1016/j.apt.2019.05.007.

19. B. Bhushan, Kousar Jahan, **Prvan Kumar Katiyar**, B.S. Murty, K. Mondal, Evolution of ZnO flowerets from dealloying of Cu-Zn alloy powder, Advanced Powder Technology**.** https://doi.org/10.1016/j.apt.2020.05.031.

20. Kuntal Sarkar**,** P.K.Rai, **Prvan Kumar Katiyar,** Biswajeet Satapathy, Abhishek Subhash Pathak**,** Monojit Dutta, Atanu Banerjee, K. Mondal, Composite (glass + crystalline) coatings from blast furnace pig iron by high velocity oxy-fuel (HVOF) process and their electrochemical behavior, Surface and Coatings Technology, Volume 372, August 2019, pp 72-83, https://doi.org/10.1016/j.surfcoat.2019.05.025.

21. Rita Maurya, Abdul Rahim Siddiqui, **Prvan Kumar Katiyar**, Kantesh Balani, Mechanical, tribological and anti-corrosive properties of polyaniline/graphene coated Mg-9Li-7Al-1Sn and Mg-9Li-5Al-3Sn-1Zn alloys, Published in Journal of Materials Science & Technology, Volume 35, Issue 8, August 2019, pp 1767-1778, https://doi.org/10.1016/j.jmst.2019.03.028.

22. Prince Kumar Singh, **Prvan Kumar Katiyar**, A.Lava Kumar et al., Agglomeration behavior of solid waste materials in steel plants, Published in Emerging Materials Research Volume 5 Issue EMR1, https://doi.org/10.1680/jemmr.15.00014.

23. Prince Kumar Singh, Kumar Avala Lava, **Prvan Kumar Katiyar**, Rita Maurya, Agglomeration behaviour of steel plants solid waste and its effect on sintering performance, Published in Journal of Materials Research and Technology, Volume 6, 2017, pp 289-296, https://doi.org/10.1016/j.jmrt.2016.11.005.

## PATENT

- Filed patent: (Application No.: 201811045364) ***Ni-VN Hydrophobic Alloy Powder***, (***Agency/Country:*** SIDBI Innovation and Incubation Centre Indian Institute of Technology Kanpur) Dr. Bharat Bhushan, **Dr. Prvan Kumar Katiyar**, Dr. Kallol Mondal and Dr. B.S. Murty.

## PRESENTATION/CONFERENCE

1. **Prvan Kumar Katiyar,** S. Misra and K. Mondal, Presented a paper on "Corrosion behaviour of newly developed TMT steel rebars" ICAMP ADMAT-SkyMat, Thiruvananthapuram, 14-16 Dec, 2017.
2. **Prvan Kumar Katiyar,** S. Misra and K. Mondal, Presented a paper on "Comparative corrosion behavior of different steel microstructures under salt fog test" Asia Steel International Conference, Bhubaneswar, 6-9 Feb, 2018.
3. **Prvan Kumar Katiyar**, N. S. Randhawa, J. Hait, R. K. Jana, K. K. Singh and T. R. Mankhand, Presented a paper on "Electrodissolution of tungsten carbide scrap: potentiodynamic studies" in "Exploration of Lean Grade Ore, Ore Fines and Urban ores: Challenges, Problems and solutions (LGO-2013)" at CSIR-NML, Jamshedpur during 22-23 Jan 2013.

4. P. K. Behera, **Prvan Kumar Katiyar**, S. Misra, and K. Mondal, (2018). "Nature of the corrosion products in tensioned reinforcing bars," Maintenance and Rehabilitation, 17th International Symposium on New Technologies for Urban Safety of Mega Cities in Asia (USMCA), Hyderabad, India, 12-14 December, p.47.
5. **Prvan Kumar Katiyar**, N. S. Randhawa, J. Hait, R. K. Jana, K. K. Singh and T. R. Mankhand Presented a paper on "Anodic dissolution behaviour of tungsten carbide scraps in ammoniacal media" in Oral Presentation in Seventeenth International Conference on Nonferrous Metals to be held on 5-6 July, 2013 in Ranchi, Jharkhand.
6. **Prvan Kumar Katiyar**, N. S. Randhawa, J. Hait, R. K. Jana, K. K. Singh and T. R. Mankhand Presented a paper on "An overview on different processes for recovery of valuable metals from tungsten carbide scrap." in Poster Presentation in 18$^{th}$ International Conference on Nonferrous Metals to be held on 11-12 July, 2014 in Nagpur, India.
7. **Prvan Kumar Katiyar**, N. S. Randhawa, J. Hait, R. K. Jana, K. K. Singh and T. R. Mankhand Presented a paper on "Electrochemical processing of tungsten carbide hard metal scrap for the recovery of tungsten and cobalt'' in Oral Presentation in 51st National Metallurgists' Day (Under the aegis of Ministry of Steel, Government of India) and 67th Annual Technical Meeting of The Indian Institute of Metals, November 12-15, 2013.
8. Prince Kumar Singh, **Prvan Kumar Katiyar,** A. Lava Kumar Bharava Chaithnya, S. Pramanik, Effect of Sintering Performance of the Utilization of Blast Furnace Solid Wastes as Pellets, International conference on Advances in manufacturing and materials engineering, AMME 2014 Procedia Materials Science, Volume 5, 2014, Pages 2468-2477

## PROFESSIONAL EXPERIENCE

07/2012-06/2013: **M Tech (Trainee),** Council of Scientific & Industrial Research-National Metallurgical Laboratory, Jamshedpur (India)

07/2013-12/2013: **Assistant Professor** (on contract)**,** Department of Material science and Metallurgical Engineering, Maulana Azad National Institute of Technology, Bhopal (**MANIT)** Bhopal MP.

07/2014-10/2014: **Teaching Assistance**, Manufacturing Process, **MSE** Department, **IIT-Kanpur**

06/2019-07/2019: **Project Scientist, MSE** Department, **IIT-Kanpur**

07/2019-12/2019 **Assistant Professor** (on contract)**,** Department of Material science and Engineering, National Institute of Technology, **Hamirpur**.

09/2019-2021: **Assistant Professor** (on contract)**,** Department of Material science and Engineering, National Institute of Technology, **Hamirpur**.

## EXTRA CURRICULAR ACTIVITIES/ACHIEVEMENTS

- Third prize in the Research Scholar Day "Padarth-2019" organized by the Department of Materials Science and Engineering, IIT-Kanpur on April 6$^{th}$, 2019.
- Best poster award for the paper: "Corrosion behavior of newly developed TMT steel rebars" Authored by **Prvan Kumar Katiyar**, S. Misra and K. Mondal, ICAMP ADMAT-SkyMat, Thiruvananthapuram, 14-16 Dec, 2017.
- Consolation prize for the paper on "Electrodissolution of tungsten carbide scrap: potentiodynamic studies" in "Exploration of Lean Grade Ore, Ore Fines and Urban ores: Challenges, Problems and solutions (LGO-2013)" at CSIR-NML, Jamshedpur, 22-23 Jan 2013.
- Qualified GATE-2011 examination (Metallurgical Engineering) and secured all India rank 474 with a gate score of 302.