PERSONAL INFORMATION

Dr. Ketan P. Gattu

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Sex Male | Date of birth 03/08/1986 | Nationality Indian

WORK EXPERIENCE

01/05/2017–Present

Assistant Professor

Department of Nanotechnology, Dr. Babasaheb Ambedkar Marathwada University Chhatrapati Sambhajinagar (India)

Courses Taught (M.Sc. Nanotechnology)

NANO 112 - Solid State- I, NANO 223 Solid State- II

NANO 334 Advances in Nanotechnology-I, NANO 445 Advances in Nanotechnology-II

NANO 449 Practical- II, NANO 339 Project I NANO 450 Project II

01/01/2022-06/09/2022

Research Associate

Marathwada Institute of Technology, Chhatrapati Sambhajinagar (India)

Design and Development of Nanomaterials using Microreactor technology

09/07/2011–31/03/2015

Project Fellow

UGC-DAE-CSR Project: Simple and Economic Biosynthesis of SnO_2 thin films for sensor applications.

Department of Nanotechnology, Dr. Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajinagar (India)

EDUCATION AND TRAINING

01/01/2022–06/09/2022

Research Associate

Marathwada Institute of Technology, Chhatrapati Sambhajinagar (India)

Project Title: Design and Development of Nanomaterials using Microreactor technology

The project aimed at creating new and innovative ways to produce nanomaterials with improved properties. The team used microreactor technology to design and develop various types of nanomaterials, including metals, metal oxides, and carbon-based materials. By the use microreactor, we were able to control the size and shape of the nanomaterials, which helped improve their properties and performance. The nanomaterials were characterized using various techniques, including X-ray diffraction, transmission electron microscopy, and scanning electron microscopy, to analyze their structural and morphological properties. The project's outcomes showed that the use of microreactor technology can be an effective method for producing high-quality nanomaterials with improved properties, which can have various applications in fields such as energy storage, catalysis, and biomedicine.

01/07/2013–29/04/2017

Ph. D. (Nanotechnology)

Dr. Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajinagar (India)

Ph. D Title: Bio-synthesis of Tin Oxide Nanoparticles Thin Film and its Engineering for Technological Application

Pure and doped SnO_2 nanoparticles have been synthesized using remnant water (ideally kitchen waste) collected from soaked Bengal gram beans (*Cicer arietinum* L.) extract. The synthesized nanoparticles

were initially investigated for their structural morphological and electronic properties. The DFT calculations were performed to understand and correlate the structural changes with electronic properties due to doping in SnO_2 lattice. For the doped samples the size decrease for Copper and Nickel doping while for Cobalt and Gold the increased. The change in size after doping is attributed to the ionic radius of the doped metal ion and was further confirmed by literature reports and DFT investigation. The UV-Vis spectroscopy study revealed the reduction of bandgap with metal doping, Raman and DFT studies confirmed the generation of structural defects and oxygen vacancies due to bio-green synthesis and incorporation of metal ions in SnO_2 lattice. Subsequently, the pure and doped biosynthesized SnO_2 nanoparticles were coated onto the glass substrate using doctor blade method to form thin films. These thin films were investigated for their gas sensing properties and were found to be highly sensitive to different gases. The synthesis method described in this work is facile and versatile, providing opportunities to control the morphology of various other semiconducting metal oxides, with particular promise for application in gas sensors.

01/07/2009–30/05/2011

M. Sc. Nanotechnology

Dr. Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajinagar (India)

M. Sc. Project: Optoelectronic Study of CdS Thin Films Ultrasonically Intercalated by Silver Nanoparticles

Silver nanoparticles were synthesized using a chemical technique. These were then ultrasonically intercalated in annealed CdS thin films. The optoelectronic properties of the films were studied and were found to be enhanced.

RESEARCH EXPERIENCE

On-going Projects

1. Design and Development of Nanomaterials using Microreactor technology
2. Bio-Green Synthesis of Carbon Composites for Energy Storage application
3. Development of Ultrasensitive Room Temperature Gas Sensor Array.

Completed Projects

Simple and Economic Biosynthesis of SnO_2 thin films for sensor applications (July 2011-March 2015)

Journal Referee

- Journal of Energy Storage
- IOP- Nanotechnology
- Materials Chemistry and Physics
- Material Research Express
- ACS Omega
- Journal of Solid-State Electrochemistry
- Energy Reports
- Journal of Physics D: Applied Physics
- New Journal of Chemistry
- Bioinspiration & Biomimetics
- Nano Express
- Physica Scripta
- Materials Today Communication
- Sensors and Actuators: B Chemical

Journal Editor

- Journal of Nanomaterials and Devices
- Synthesis, Characterization and Processing of New Materials for Innovative Applications (SCPNMIA)

EXPERIMENTAL TECHNIQUES

Instruments handled

- Ultra High Vacuum DC Sputter coating Unit (Hind high Vac)
- Ultra High Vacuum PVD Unit (Hind high Vac)
- Ultraviolet-vis spectrophotometer (Perkin Elmer Lambada 25),
- Powder X-ray diffraction (Bruker D8 Advance)
- Photoluminescence Spectroscopy, Fluorescence Spectroscopy (Avantes spec with fiber optic)
- Infrared Spectroscopy (Bruker, Germany Model: Vertex 70 spectrometer)
- Brunauer Emmett Teller (BET) Surface Area analyzer (Quantachrome, Autosorb iQ)
- Electrochemical Workstations: CHI 660E, Gamry Interface 1000
- Keithley Source meter 2400
- Scanning Electron Microscopy (MIRA II LMH from TESCAN)
- Transmission Electron Microscopy (TEM) (Familiar with Tecnai-G2 20 TEM)
- Thermogravimetry Analysis Differential Scanning Calorimeter, Differential Thermal Analysis (TA

Instruments SDT-Q600,)

- Raman Spectroscopy (STR-150 series, Japan)
- Dynamic light scattering (Zetasizer Nano series, Malvern Panalytical)
- Gas Sensing Unit (Home built system)

PERSONAL SKILLS

Digital skills

-Efficient in using software for computer interface devices
viz. Gamry interface 1000, CHI600, Keithley 2400
- Efficient in using *MedeA 2.0 for Density functional theory Calculations*
- Efficient in using research software viz. Origin, Endnote, Fullprof, WSxM, Xpert Highscore.
- Efficient in using Microsoft Office (MS-Word, Ms-Powerpoint, Ms-Excel, etc)
- Efficient in Programming using C and C++

Communication skills

-Good English language skills acquired during education from primary school to Ph.D. with English as the medium of instructions.

-Excellent communication skills acquired through teaching experience as a lecturer for post-graduate (Master of Science) course and through presentations and participation in various National and International Conferences, Seminars, Workshops.

-Excellent contact skills gained through mentoring masters students and organizing events (workshops, lecture series, etc)

ADDITIONAL INFORMATION

Patents

1. "A microreactor arrangement for conversion of CO_2 into ethanol in combination with nanolayer and nanomaterial-based electrodes and process thereof" **Indian Patent Grant Number 433237**
2. "Synthesis of Spinel ferrite quantum dots using subsequent alternating electro-magnetic field assisted pressurised micro fluidic system" **Patent application # 202221029926** (filed)

Invited Talk

Ketan P. Gattu, Green-Economic Strategies of Nanomaterial Synthesis for Technological Application - RSRI CRSET, Goa, 23 June 2018

Ketan P. Gattu, Careers in Nanotechnology, Shiv Chhatrapati College, Chhatrapati Sambhajinagar, 20th Jan. 2020

Ketan P. Gattu, The Magic of Nanotechnology: Gateway to Limitless Opportunities, Shri. Dr. R. G. Rathod Arts & Science College, Murtizapur, Dist-Akola, 28th Feb 2024

Ketan P. Gattu, The Magic of Nanotechnology: Gateway to Limitless Opportunities, Late Rajkamalji Bharti Arts, Commerce and Smt. Sushilabai R. Bharti Science College, Arni Dist - Yavatmal (M.S.), 28th Feb 2024

Publications

1) **Ketan P. Gattu**, Dipak A. Tonpe, Vishnu V. Kutwade, Sung-Hwan Han, Bhaskar Sathe & Ramphal Sharma, Stable next generation Na-S_xSe_y hybrid battery: effect of vinylene carbonate (VC) additives (Under preparation)
2) Kalidas B Gaikwad, **Ketan P Gattu**, Chaitali V More, Hasan Ogul, Pravina P Pawar, Gamma-ray shielding features of $Co_{1-x}Cu_xFe_2O_4$ ferrite: A combined experimental, theoretical and simulation investigation, Radiation Physics and Chemistry, 224 (2024) 111996
3) Makrand E Sonawane, **Ketan P Gattu**, Dipak A Tonpe, Vishnu V Kutwade, Ibrahim MS Mohammed, Faizan M Khan, Prakash S Gajbar, Sumaiyya F Shaikh, Ramphal B Sharma, MoS_2 augmentation in CZTS solar cells: Detailed experimental and simulation analysis, Nano-Structures & Nano-Objects, 39 (2024) 101268.
4) Makrand E Sonawane, **Ketan P Gattu**, Vishnu V Kutwade, Dipak A Tonpe, Faizan M Khan, Sumaiyya Shaikh, Prakash S Gajbar, Ramphal B Sharma, Ni doping in CZTS solar cells: a path to enhanced photovoltaic performance, Indian Journal of Physics, (2024) 1.
5) V.A. Mane, D.V. Dake, N.D. Raskar, R.B. Sonpir, **K.P. Gattu**, M.D. Shirsat, B.N. Dole, Harnessing the synergistic effects of graphene oxide based Sn/Fe codoped Bi_2O_3 nanocomposites for superior supercapacitor performance, Journal of Energy Storage, 96 (2024) 112636.
6) N.D. Raskar, D.V. Dake, V.A. Mane, R.B. Sonpir, H.A. Khawal, V.D. Mote, M. Vasundhara, K. Asokan, **K.P. Gattu**, B.N. Dole, Nanoengineered reduced graphene oxide-Fe doped α-MnO_2: A

multifunctional smart material for energy storage and environmental remediation, Journal of Energy Storage, 86 (2024) 111206.

7) K.B. Gaikwad, **K.P. Gattu**, C.V. More, P.P. Pawar, Physical, structural and nuclear radiation shielding behavior of Ni–Cu–Zn Fe_2O_4 ferrite nanoparticles, Applied Radiation and Isotopes, 207 (2024) 111244.
8) **Ketan P. Gattu**, Dipak A. Tonpe, Vishnu V. Kutwade, Sung-Hwan Han, Bhaskar Sathe & Ramphal Sharma, ZnO-PANI Nanocomposite: Enhanced Electrochemical Performance towards Energy Storage, Journal of Energy Storage, 81 (2024/03/15/ 2024): 110434.
9) Gaikwad, Kalidas B., **Ketan P. Gattu**, Chaitali V. More, M. I. Sayyed, Kanchan R. Niras, and Pravina P. Pawar. "Experimental Evaluation of Gamma Radiation Attenuation Properties of $Ni_{0.2}Mg_xZn_{0.8-x}Fe_2O_4$." Optical Materials 148 (2024/02/01/ 2024): 114807.
10) Sumaiyya Shaikh, Vishnu V. Kutwade, **Ketan P. Gattu**, Faizan Khan, Prakash Gajbar, Makrand Sonawane, Dipak A. Tonpe, Mahesh Sharma, Deepak Singh Rajawat, and Ramphal Sharma. "Formulation of Microwave Assisted Z-Scheme Mos2@Tio2: Explored Physicochemical Properties and Photodegradation of Mo Dye." Journal of Dispersion Science and Technology, 1-14.
11) Rashed, Shukri, Vishnu V. Kutwade, **Ketan P. Gattu**, Ghamdan M. M. Gubari, and Ramphal Sharma. "Growth and Exploration of Inorganic Semiconductor Electron and Hole Transport Layers for Low-Cost Perovskite Solar Cells." Trends in Sciences 20, no. 10 (2023): 5839-39.
12) H. Jang, H.T. Bui, J. Han, M. Sung, V.V. Kutwade, **K.P. Gattu**, M.C. Sharma, S.-H. Han, R. Sharma, Investigating the influence of vinylene carbonate concentrations on battery stability: role of electrode/electrolyte interfaces, Journal of Solid State Electrochemistry, (2023).
13) Vishnu V Kutwade, Ketan P Gattu, Faizan Khan, Prakash Gajbar, Sumaiyya Shaikh, Ramphal Sharma, Exploration of ZnMgS loaded with biosynthesized TiO2 as an efficient photocatalyst for solar energy mediated MB degradation, J. Mater. Sci. -Mater. Electron, 34 (2023) 1-18.
14) Madhuri Patil, Hyungil Jang, Sung-Hwan Han, **Ketan P. Gattu**, Dipak A. Tonpe, Vishnu V. Kutwade & Ramphal Sharma, Electrochemical performance of low-cost PANI-anchored CuS electrode for lithium-ion batteries, Applied Physics A, 129 (2023) 142.
15) Shankar D. Birajdar, Atul R. Saraf, Aruna P. Maharolkar, **Ketan P. Gattu**, Nilesh G. Patil, Rushikesh B. Chavan, Mangesh V. Jamkar, Yuvraj S. Mundhe, Ravindra N. Kambale, Ravindra C. Alange, Intrinsic defect-induced magnetism and enhanced photocatalytic activity in $Zn_{1-x}Zr_xO$ ($0.0 \leqslant x \leqslant 0.07$) nanoparticles for spintronic device and photocatalytic application, J. Alloy. Compd., 929 (2022) 167272.
16) Deepak S. Upadhye, Avinash S. Dive, Ravikiran B. Birajadar, Sagar B. Bagul, **Ketan P. Gattu**, Ramphal Sharma, Low-concentration ammonia gas sensing using polyaniline nanofiber thin film grown by rapid polymerization technique, J. Mater. Sci. -Mater. Electron, 33 (2022) 23016-23029.
17) Dipak A Tonpe, **Ketan P Gattu**, Vishnu V Kutwade, Makrand E Sonawane, Mahesh C Sharma, Hyungil Jang, Sung-Hwan Han, Ramphal Sharma-"ZnS-PANI nanocomposite with enhanced electrochemical performances for lithium-ion batteries", J. Mater. Sci. -Mater. Electron, 33 (2022) 18452 (https://doi.org/10.1007/s10854-022-08698-5)
18) Vishnu V Kutwade, **Ketan P Gattu**, Makrand E Sonawane, Faizan Khan, Dipak A Tonpe, Mohammad Balal, Sudipta Roy Barman, Ramphal Sharma- "Growth and exploration of visible-light-driven enhanced photocatalytic activity of $Cu_{1-x}Cr_xS$/CdS heterojunction thin film for active dye degradation" Applied Physics A, 128 (2022) 625 (https://doi.org/10.1007/s00339-022-05757-w)
19) Vishnu Kutwade, **Ketan Gattu**, Dipak Tonpe, Makrand Sonawane, Manoj Mishra, and Ramphal Sharma – "Theoretical modelling and optimization: Cd-free CTS/Zn(O,S)/ZnO thin film solar cell"; Material Today Communications, (Nov 2021)
20) Vishnu Kutwade, **Ketan Gattu**, Dipak Tonpe, Makrand Sonawane, Manoj Mishra, and Ramphal Sharma – "Contribution in PCE enhancement: numerical designing and optimization of SnS thin film solar cell"; Journal of Nanoparticle Research, 23 (2021) 146 (https://doi.org/10.1007/s11051-021-05259-5).
21) Vishnu V. Kutwade; Ketan **P. Gattu**; Avinash S. Dive; Makrand E. Sonawane; Dipak A. Tonpe; Ramphal Sharma, Enhanced photosensing by Mg-doped ZnO hexagonal rods via a feasible chemical route, J. Mater. Sci. -Mater. Electron 32, pages6475–6486 (2021).
22) Dipak A. Tonpe; **Ketan P. Gattu**; Vishnu V. Kutwade; Makrand E. Sonawane; Avinash S. Dive; Ramphal Sharma, Development of organic/inorganic PANI/ZnO 1D nanostructured hybrid thin-film solar cell by soft chemical route, J. Mater. Sci. -Mater. Electron 30, 16056-16064 (2019).
23) **Ketan P. Gattu**, Anil A. Kashale, Kalyani Ghule, Vijay H. Ingole, Ramphal Sharma, Nishad G. Deshpande, Anil V. Ghule, NO_2 sensing studies of bio-green synthesized Au-doped SnO_2, J. Mater. Sci.- Mater. Electron 28(17) (2017) 13209-13216.
24) Avinash S. Dive, Nanasaheb P. Huse, **Ketan P. Gattu**, Ramphal Sharma, "Soft Chemical Growth

of $Zn_{0.8}Mg_{0.2}S$ One Dimensional Nanorod Thin films for Efficient Visible Light Photosensor" Sensors Actuators A: Physical 266 (2017) 36-45.

25) Avinash S. Dive, **Ketan P. Gattu,** Nanasaheb P. Huse, Ramphal Sharma, "Single-step chemical growth of ZnMgS nanorod thin film and its DFT study" Materials Science and Engineering: B 288 (2018) 91-95.

26) Nanasaheb P. Huse, Avinash S. Dive, **Ketan P. Gattu**, Ramphal Sharma, An experimental and theoretical study on soft chemically grown CuS thin film for photosensor application, Mat Sci Semicon Proc 67 (2017) 62-68.

27) Anil A. Kashale, Kalyani A. Ghule, **Ketan P. Gattu**, Vijay H. Ingole, Swapnali S. Dhanayat, Ramphal Sharma, Yong-Chien Ling, Jia-Yaw Chang, Madagonda M. Vadiyar, Anil V. Ghule, Annealing atmosphere dependent properties of biosynthesized TiO_2 anode for lithium-ion battery application, J. Mater. Sci. - Mater. Electron. 28(2) (2017) 1472-1479.

28) Avinash S. Dive, Nanasaheb P. Huse, **Ketan P. Gattu**, Ravikiran B. Birajdar, Devesh R. Upadhyay, Ramphal Sharma, Theoretical and experimental investigations of intermediate bands in ZnS–Mg nanocrystalline thin film photosensor, J. Mater. Sci. - Mater. Electron. 28(2) (2017) 15161–15167.

29) Anil A. Kashale, **Ketan P. Gattu**, Kalyani Ghule, Vijay H. Ingole, Swapnali Dhanayat, Ramphal Sharma, Jia-Yaw Chang, Anil V. Ghule, Biomediated green synthesis of TiO_2 nanoparticles for lithium-ion battery application, Compos Part B-Eng 99 (2016) 297-304.

30) Vijay H. Ingole, Kamal H. Hussein, Anil A. Kashale, **Ketan P. Gattu**, Swapnali S. Dhanayat, Aruna Vinchurkar, Jia-Yaw Chang, Anil V. Ghule, Invitro Bioactivity and Osteogenic Activity Study of Solid State Synthesized Nano-Hydroxyapatite using Recycled Eggshell Bio-waste, Chemistryselect 1(13) (2016) 3901-3908.

31) **Ketan P. Gattu**, Kalyani Ghule, Anil A. Kashale, Vikas B. Patil, D. M. Phase, R. S. Mane, S. H. Han, Ramphal Sharma, Anil V. Ghule, Bio-green synthesis of Ni-doped tin oxide nanoparticles and its influence on gas sensing properties, Rsc Adv 5(89) (2015) 72849-72856.

32) **Ketan P. Gattu**, Kalyani Ghule, Anil A. Kashale, R. S. Mane, Ramphal Sharma, D. M. Phase, S. H. Han, Anil V. Ghule, Room Temperature Ammonia Gas Sensing Properties of Biosynthesized tin Oxide Nanoparticle Thin Films, Curr Nanosci 11(2) (2015) 253-260.

Conference proceedings

1) Kalidas B Gaikwad, **Ketan P Gattu**, Shamsan S Obaid, Pravina P Pawar, Comparative study of radiation shielding parameters for $NiFe_2O_4$ and $CoFe_2O_4$ nanoparticles, AIP Conference Proceedings 3149 (2024) 020014

2) Soni B. Tarwate, Swati S. Wahule, **Ketan P. Gattu**, Anil V. Ghule, Ramphal Sharma, Hydrothermal synthesis of MnO_2 thin film for supercapacitor application, AIP Conference Proceedings 1953 (1) (2018) 030052

3) **Ketan P. Gattu**, Kalyani Ghule, Nanasaheb P. Huse, Avinash S. Dive, Sagar B. Bagul, Renuka V. Digraskar, Ramphal Sharma, Anil V. Ghule, Bio-green synthesis of Fe doped SnO_2 nanoparticle thin film, AIP Conference Proceedings 1832(1) (2017) 050162.

4) Nanasaheb P. Huse, Avinash S. Dive, **Ketan P. Gattu**, Ramphal Sharma, One step synthesis of kestarite Cu_2ZnSnS_4 thin film by simple and economic chemical bath deposition method, AIP Conference Proceedings 1832(1) (2017) 080082.

5) Avinash S. Dive, Nanasaheb P. Huse, **Ketan P. Gattu**, Ramphal Sharma, A high visible light ZnMgS nanorod thin film photosensor by solution growth technique, AIP Conference Proceedings 1832(1) (2017) 120007.

6) Dipak A. Tonpe, **Ketan P. Gattu**, Ganesh V. More, Deepak S. Upadhye, Sandip V. Mahajan, Ramphal Sharma, Synthesis of $CuFeS_2$ thin films from acidic chemical baths, AIP Conference Proceedings 1728(1) (2016) 020676.

7) Pawan P. More, Swapnali S. Dhanayat, **Ketan P. Gattu**, Sandeep V. Mahajan, Deepak S. Upadhye, Ramphal Sharma, Annealing effect on Cu_2S thin films prepared by chemical bath deposition, AIP Conference Proceedings 1728(1) (2016) 020489.

8) Renuka V. Digraskar, **Ketan P. Gattu**, Bhaskar R. Sathe, Anil V. Ghule, Ramphal Sharma, Temperature dependent fabrication of cost-effective and nontoxic Cu_2ZnSnS_4 (CZTS) thin films for solar cell, AIP Conference Proceedings 1728(1) (2016) 020326.

9) Yogesh A. Jadhav, **Ketan P. Gattu**, Anil Ghule, Ramphal Sharma, Structural morphological and optoelectronic study of titania and gold doped titania nanoparticles grown by sol-gel technique, AIP Conference Proceedings 1512(1) (2013) 332-333.

Honours and awards

IOP Trusted Reviewer Certificate by Institute of Physics (IOP), 12th December, 2023.

Best Young Researcher Award by REST Society for Research International, 23rd June 2018, Goa.

University Scholar Fellow, Dr. Babasaheb Ambedkar Marathwada University Chhatrapati Sambhajinagar (April 2015 to April 2017)

University Topper, M. Sc Nanotechnology (2009-2011), Dr. B. A. M. University, Chhatrapati Sambhajinagar.

Membership

Life Member of The Indian Science Congress Association (ISCA) (*Membership No. L30593*)

OTHER ACADEMIC ACTIVITIES

- Serving as examiner for Nanotechnology,
- Serving as subject expert in Nanoscience
- Designed syllabus for the Department of Nanotechnology, Dr. Babasaheb Ambedkar Marathwada University.
- Serving as internal examiner- Department of Nanotechnology, Dr. Babasaheb Ambedkar Marathwada University
- Served as paper setter-Department of Nanotechnology, Dr. Babasaheb Ambedkar Marathwada University

EXPERIENCE OF GUIDING M.Sc. RESEARCH PROJECTS

1. **Rushikesh Here,** Synthesis of Graphene oxide, MnO and Go doped in MnO Nanocomposite. ***MS Student,*** Dept of Nanotechnology, 2022
2. **Sandhya Khajekar**, Synthesis and Characterization of Copper Oxide by Reflux, Coprecipitation and Green Synthesis Method, ***MS Student,*** Dept of Nanotechnology, 2022
3. **Shubhangi Jadhav**, Nickel Oxide Nanoparticles as a Photocatalyst for Solar Energy-Mediated MB Degradation, ***MS Student,*** Dept of Nanotechnology, 2023
4. **Roshani Mohod,** $NiCo_2O_4$ Nanowires with High Capacitance and Long Cycle Life for Supercapacitor Application, ***MS Student,*** Dept of Nanotechnology, 2023
5. **Diksha Lihnar,** Synthesis of SnS_2 Nanomaterial by Chemical Bath Deposition for Photocatalytic Application, ***MS Student,*** Dept of Nanotechnology, 2023
6. **Pratima Salve**, Photocatalytic Activity of Hydrothermally Synthesized MoS_2 Nanostructures Under Visible Light Irradiation, ***MS Student,*** Dept of Nanotechnology, 2023

References

Dr. Anil V. Ghule

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