

Professor Vineet Kumar Rai

1. Books/Reports/Chapters/General articles etc.:

A. Books: 01

Book Title: Upconverting nanoparticles- From fundamentals to applications, Editor: Vineet K. Rai, Published by WILEY- VCH, ISBN: 978-3-527-83487-7 (e-book); ISBN 978-3-527-34965-4 (Print); ISBN: 978-3-527-83488-4 (O-book), First published 11 May 2022. DOI: 10.1002/9783527834884.

B. Editor of the conference proceedings:

(01) One

Edited one conference proceedings of National conference on Advances in lasers and Spectroscopy (ALS-2012). ISBN 978-81-8424-806-7; Allied Publishers Pvt. Ltd., New Delhi, India. Edited by Vineet Kumar Rai, Pankaj Mishra and Kaushal Kumar.

C. Reports/Chapters/General articles, etc.:

S. No.	Title	Authors Name	Publisher	Year of publication
1	Book title: Advanced Nanomaterials for Solution-Processed Flexible Optoelectronic Devices; Chapter title: Advanced Nanomaterials for the Deposition of All Layers Solution-Processed Photovoltaic Devices; Edited By: Manjeet Singh, Ashish Kumar Singh ISBN: 978-1-032-96050-0 (ebk)	Lakshmi Mukhopadhyay and Vineet Kumar Rai	Taylor and Francis, CRC publishers Chapter 6, pg. no. 120-141, 2025, DOI: 10.1201/9781032960500	2025
2	Book title: Layered Nanomaterials for Solution-Processed Optoelectronics (1 st Edition) Chapter title: MXene as a Co-catalyst for photoelectrochemical devices for H ₂ production; edited by Manjeet Singh, Ashish Kumar Singh, Balaram Pani; EBook: ISBN 9781003509509	Manoj Hazarika and Vineet Kumar Rai	Taylor and Francis, CRC publishers Chapter 4, pg. no. 62-83, 2025, https://doi.org/10.1201/9781003509509	2025
3	Book title: Upconversion nanoparticles for functional applications Chapter title: Upconversion luminescence sensitized pH-nanoprobes	Vishab Kesarwani and Vineet Kumar Rai	Springer Nature ISBN:978-981-99-3912-1	2023
4	Book Title: Upconverting nanoparticles- from fundamentals	Manisha Mondal, Vineet Kumar Rai	Wiley-VCH GmbH, Print ISBN:978352734	2022

	to applications Chapter title: Introduction to Upconversion and Upconversion Nano particles.		9654, Online ISBN:978352783 4884, Pages 1-30.	
5	Book Title: Upconverting nanoparticles- from fundamentals to applications Chapter title: Synthesis protocol of upconversion nanoparticles.	Lakshami Mukhopadhyay, V. K. Rai	Wiley-VCH GmbH, Print ISBN:978352734 9654, Online ISBN:978352783 4884, Pages 31-65.	2022
6	Book Title: Upconverting nanoparticles- from fundamentals to applications Chapter title: Fundamental aspects of up converting nano-particles (UCNPs) based on their properties.	Sushil Kumar Ranjan, Sasank Pattnaik, Vishab Kesarwani, V. K. Rai	Wiley-VCH GmbH, Print ISBN:978352734 9654, Online ISBN:978352783 4884, Pages 117-140.	2022
7	Book Title: Upconverting nanoparticles- from fundamentals to applications Chapter title: Frequency upconversion in UCNPs containing transition metal ions.	Manisha Prasad, V. K. Rai	Wiley-VCH GmbH, Print ISBN:978352734 9654, Online ISBN:978352783 4884, Pages 141-169.	2022
8	Book Title: Upconverting nanoparticles- from fundamentals to applications Chapter title: Frequency upconversion in UCNPs containing rare earth ion.	Sasank Pattnaik, V. K. Rai	Wiley-VCH GmbH, Print ISBN:978352734 9654, Online ISBN:978352783 4884, Pages 171-219.	2022
9	Book Title: Upconverting nanoparticles- from fundamentals to applications Chapter title: UC NPs in detection of fungicides and plant viruses.	Vishab Kesarwani, V. K. Rai	Wiley-VCH GmbH, Print ISBN:978352734 9654, Online ISBN:978352783 4884, Pages 493-516.	2022

10	Book title: Laser and its applications for Material Science and Nanotechnology Chapter title: Rare earth earth doped upcoming phosphors for display and temperature sensing applications	Astha Kumari, Abhishek Kumar Soni and Vineet Kumar Rai	Material Focus (American Scientific publisher) Vol-5, pp.1-8.	2016
11.	Book title: Spectroscopic Techniques for Security, Forensic and Environmental Applications. Chapter title: Rare Earth Doped Materials for temperature Sensors	Anurag Pandey and Vineet Kumar Rai	Published by Nova Science Publishers, Inc. New York, USA, ISBN: 978-1-63117-404-9	2014
12	Book title: Nanotechnology in Polymers, Studium Press LLC, P.P. Box 722200, Huston, Texas 77072, USA. Chapter title: Doped polymers, Polymer Nano- Fibers and Density Functional Theory	Pankaj Mishra and Vineet Kumar Rai	ISBN 1-933699-90-6	2012
13	Book title: Solid State Laser Chapter title: Frequency upconversion in rare earth ions in Rare Earth Ions	Vineet Kumar Rai	ISBN 978-953-51-0086-7	2012

D) Publications during last seven years:

1. Vijay Singh, **Rai V. K.**, N. Singh, M. S. Pathak, M. Rathaiah, V. Venkatramu, Pramod K. Singh, S. J. Dhoble (2017): Spectrochimica Acta Part A, 171, 229–235.
2. Renuka Bokolia.; Manisha Mondal; **Rai, V. K.**; K. Sreenivas (2017): J. Appl. Phys., 121, 084101.
3. Tamilmani, Vairapperumal; Kumari, Astha; **Rai, V.K.**; Unni Nair, Balachandran; Sreeram, Kalarical Janardhanan (2017): Journal of Physical Chemistry, 121, 4505–4516.
4. A. Dubey, A. K. Soni, Astha Kumari, Riya dey, **Rai, V. K.** (2017): J. Alloys and Compounds, 693, 194–200.
5. Shriya Sinha, Manoj K. Mahata, **Rai, V. K.**, K. Kumar (2017): Spectrochimica Acta Part A, 173, 369-375.
6. Manisha Mondal; Rai, V. K.; Chandan Srivastava (2017): Chemical Engineering Journal, 327, 838–848.
7. Sushil K. Ranjan; A. K. Soni; **Rai, V. K.** (2017): Methods and Applications in Fluorescence, 5, 035004.
8. Mohd Azam, **Rai, V. K.** (2017): Solid State Sciences, 66, 7-15.

9. Manisha Mondal; **Rai, V. K.**; Chandan Srivastava, S. Sarkar, Akash R. (2016): J. Appl. Phys., 120, 233101.
10. Abhishek Kumar Soni, **Rai, V. K.** (2017): Chemical Physics Letters, 667, 226–232.
11. Anita Kumari; A. K. Soni; **Rai, V.K.** (2017): Infrared Physics & Technology, 81, 313–319.
12. Dey Riya, **Rai, V. K.** (2017): Methods and Applications in Fluorescence, 5, 015006.
13. Abhishek Kumar Soni, **Rai, V. K.**, Manoj K. Mahata (2017): Materials Research Bulletin, 89, 116-124.
14. Lakshmi Mukhopadhyay, **Rai, V. K.**, R. Bakolia, K. Sreenivas (2017): J. Luminescence, 187, 368–377. New Journal of Chemistry, **41**, 7650 - 7661.
15. Mohd Azam; **Rai, V. K.**, D. K. Mohanty (2017): Methods and Applications in Fluorescence, 5, 035005.
16. Tamilmani, Vairapperumal; A. K. Soni; **Rai, V.K.**; Unni Nair; Balachandran; Sreeram, Kalarical Janardhanan (2017): Journal of Chemical Sciences, 129, 1929–1940.
17. Joydip Dutta, **Rai, V. K.** (2018): Methods and applications in fluorescence, **6**, 025003.
18. Anita Kumari; Manisha Mondal; **Rai, V.K.**, S. N. Singh (2018): Methods and Applications in Fluorescence, 6, 015003.
19. Manisha Mondal; **Rai, V. K.** (2018): Journal of Industrial and Engineering Chemistry, 60, 125-132.
20. V. Singh, N. Singh, M. S. Pathak, Hakyung Jeong, S. Watanabe, T. K. Gundu Rao, V. Dubey, **Rai, V.K.** (2018): Journal of Materials Science: Materials in Electronics, 29, 3006–3013.
21. Manglesh Yadav, Manisha Mondal, L. Mukhopadhyay, **Rai, V. K.** (2018): Methods and Applications in Fluorescence, 6, 025001.
22. Mohd Azam; **Rai, V. K.** (2018): Methods and Applications in Fluorescence, 6, 025002.
23. Sushil K. Ranjan; A. K. Soni; **Rai, V. K.** (2018): Luminescence: The Journal of Biological and Chemical Luminescence, 33, 647-653.
24. Manisha Mondal; **Rai, V. K.** (2018): J. Alloys & Comp., 750, 304-311.
25. A.K. Soni; Rai, V. K. (2018): J. Rare Earths, 36, 1256-1263, DOI: 10.1016/j.jre.2018.03.034.
26. K. Janani; S. Ramasubramanian; A. K. Soni; Rai, V. K.; P. Thiagarajan (2018): Optik, 169, 147-155.
27. Sushil K. Ranjan; Manisha Mondal; **Rai, V. K.** (2018): Materials Research Bulletin, 106, 66-73.
28. Lakshmi Mukhopadhyay, **Rai, V. K.** (2018): New J. Chemistry, **42**, 13122-13134.
29. Anita Kumari; Lakshmi Mukhopadhyay; **Rai, V.K.** (2019): $\text{Er}^{3+}/\text{Yb}^{3+}/\text{Li}^{+}/\text{Zn}^{2+}$: Journal of Rare Earths, 37, 242-247
30. Mitesh Chakraborty, **Rai, V. K.**, Knutal Mitra (2019): Pramana – J. Phys., **92**, 46.
31. Joydip Dutta, **Rai, V. K.** (2019): IEEE, Sensor, **19**, 3609-3615.
32. Anita Kumari; Lakshmi Mukhopadhyay; **Rai, V.K.** (2019): New J. Chemistry, **43**, 6249 - 6256, DOI: 10.1039/C9NJ00463G.
33. Joydip Dutta, **Rai, V. K.**, M. Mdurai, R. Thangavel (2019): IEEE Journal of Photovoltaics, **9**, 1040-1045, DOI: 10.1109/JPHOTOV.2019.2912719.
34. Mohd Azam; **Rai, V. K.** (2019): ACS Omega, **4** (15) 16280-16291.
35. Vairapperumal Tamilmani; Mukhopadhyay Lakshmi; **Rai, V. K.**; Sreeram, Kalarical Janardhanan; Mishra Ashok (2020) J. Luminescence, **217**, 116761.
36. Lakshmi Mukhopadhyay, **Rai, V. K.** (2020): Materials Research Bulletin, **121**, 110628.

37. Sasank Pattnaik, **Rai, V. K. (2020)**: Materials Research Bulletin, **125**, 110761.
38. Sonali Biswas, Lakshmi Mukhopadhyay, Manisha Mondal, **Rai, V. K. (2021)**: J. Rare Earths, **39**, 291-296.
39. Manisha Prasad, **Rai, V.K. (2020)**: J. Alloys and Compounds, **837**, 155289.
40. Manisha Mondal; **Rai, V. K. (2020)**: Optics and Laser Technology, **130**, 106341.
41. Manisha Mondal; **Rai, V. K. (2020)**: J. Alloys and Compounds, **844**, 155914.
42. Tamilmani, Vairapperumal; Mondal Manisha; **Rai, V.K.**; Mishra, A. K. (2021): J. Alloys and Compounds, **857**, 157575.
43. Joydip Dutta, Mitesh Chakraborty, **Rai, V.K. (2021)**:Optik, **233**, 166558.
44. Joydip Dutta, **Rai, V.K. (2021)**:Optics and Laser Technology, **140**, 107087.
45. Lakshmi Mukhopadhyay, **Rai, V. K. (2021)**: J. Alloys and Compounds, **878**, 160351.
46. Sasank Pattnaik, **Rai, V. K. (2021)**:Materials Science & Engineering B, **272**, 115318.
47. Mohd Azam, Deepak Kumar Mohanty, **Rai, V. K.**, K. Singh (2021):J. Luminescence, **239**, 118319.
48. Vishab Kesrwani, **Rai, V. K. (2022)**: Optics and Laser Technology, **146**, 107535.
49. Sasank Pattnaik, Rai, V. K. (2022): Methods Appl. Fluoresc., **10**, 034002.
50. Manisha Prasad, **Rai, V.K. (2022)**: J. Alloys & Compounds, **911**, 164968.
51. Sasank Pattnaik, M. Mondal, Lakshmi Mukhopadhyay, Susmita Basak, Rai, V. K., R. Giri, Vijay Singh (2022): New J. Chemistry, **46**, 10897-10906.
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55. Sasank Pattnaik, **Rai, V. K. (2022)**: Journal of Alloys and Compounds, **929**, 167237.
56. Sushri Sangita Nandaa, Priyanka Nayaka, Sasank Pattnaik, **Rai, V. K. (2023)**: Journal of Alloys and Compounds, **934**, 167732.
57. Priyanka Nayaka, Sushri Sangita Nandaa, Sasank Pattnaik, **Rai, V. K.**, R.K. Sharma, S. Dash (2023):Optics and Laser Technology, **159**, 108990.
58. Vishab Kesrwani, **Rai, V. K. (2023)**: Journal of Non-Crystalline Solids, **603**, 122129.
59. Manisha Prasad, **Rai, V.K. (2023)**: Materials Research Bulletin, **160**, 112116.
60. Manisha Prasad, **Rai, V.K. (2023)**: New J. Chem., **47**, 7381-7390.
61. Manisha Prasad, Vishab Kesrwani, **Rai, V.K. (2023)**:RSC Adv., **13**, 15833-15842.
62. Manisha Prasad, **Rai, V.K. (2023)**: RSC Advances, **13**, 20342 - 20350.
63. Tamilmani Vairapperumal, Sasank Pattnaik, **Rai, V.K.**, Balakumar Subramanian (2023): Materials Today Communications, **36**, 106500.
64. Lakshmi Mukhopadhyay, Sasank Pattnaik, **Rai, V. K. (2023)**: RSC Advances, **13**, 21096.
65. Vishab Kesrwani, **Rai, V. K. (2023)**: Materials Research Bulletin, **167**, 112445.
66. Joydip Dutta, Mitesh Chakraborty, **Rai, V.K. (2023)**: RSC Advances, **13**, 23386-23395.
67. Mohd Azam, **Rai, V.K.**, Savidh Khan, Kulvir Singh (2024):Methods Appl. Fluoresc. **12**, 035008, DOI 10.1088/2050-6120/ad5075.
68. Manoj Hazarika, Lutukurthi D. N. V. V. Konda, **Rai, V.K. (2024)**: Journal of Alloys and Compounds **1002**, 175453.
69. Sonali Tomar, Neeraj Kumar Mishra, Vishab Kesarwani, **Rai, V.K.**, Kaushal Kumar, Chikkadasappa Shivakumara, (2024): ACS Appl. Opt. Mater., **2**, 1965–1984. Cite this: <https://doi.org/10.1021/acsaom.4c00306>.
70. Abhishek Kumar Soni, **Rai, V. K. (2024)**: J. Alloys and Compounds, **1008**, 176773.
71. Abhishek Kumar Soni, Sandeep Kumar, Navratan Parihar, **Rai, V.K. (2025)**: Journal of Molecular Structure, **1322**, 140555.

72. Lakshmi Mukhopadhyay, **Rai, V. K.** (2025): J. Industrial and Engineering Chemistry (accepted).

E. M.Sc. / B. Tech Engg. Physics Dissertation

1. Photoluminescence study in $\text{Er}^{3+}\text{-Yb}^{3+}\text{-W}^{6+}$ YNbO_4 phosphors-Sonali, Guided by Dr. V. K. Rai at Department of Applied Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2017).
2. Upconversion emission studies in $\text{Tb}^{3+}\text{-Yb}^{3+}$ codoped BaZrO_3 phosphors-Manisha Prasad, Guided by Dr. V. K. Rai at Department of Applied Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2017).
3. Synthesis and characterization of $\text{Er}^{3+}\text{-Yb}^{3+}\text{:ZnWO}_4$ phosphors-Sonali Biswas, Guided by Dr. V. K. Rai at Department of Applied Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2018).
4. Intense blue upconversion emission and intrinsic optical bistability in $\text{Tm}^{3+}\text{/Yb}^{3+}\text{/Zn}^{2+}$ tridoped phosphors-Manglesh Yadav (B.Tech. Engg. Physics), Guided by Dr. V. K. Rai at Department of Applied Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2018).
5. Photoluminescence study in $\text{Er}^{3+}\text{-Yb}^{3+}$ doped $\text{NaGd}(\text{MoO}_4)_2$ phosphors, Susmita Basak (2019), Guided by Dr. V. K. Rai at Department of Applied Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2019).
6. Yb^{3+} sensitized $\text{Er}^{3+}\text{:Ba}_2\text{MgWO}_6$ upconverting phosphors for colour tunable display devices, Devendra Pal Singh (2019) Guided by Dr. V. K. Rai at Department of Applied Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2019).
7. Intense yellowish green upconversion emission in $\text{Ho}^{3+}\text{-Yb}^{3+}\text{:GdVO}_4$ phosphors, Kunal Mishra (2019) Guided by Dr. V. K. Rai at Department of Applied Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2019).
8. Upconversion spectral performance in $\text{Er}^{3+}\text{/Yb}^{3+}\text{: NaY}(\text{WO}_4)_2$ phosphors, Priyanka Mandal (2020) Admission no: 18MS0027, Guided by Professor V. K. Rai at Department of Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2020).
9. Basic understanding of upconversion emission properties in inorganic materials, Mahendra Kumar Yadav (2020), B. Tech in Engineering Physics, Admission no:16JE002120 Guided by Professor V. K. Rai at Department of Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2020).
10. Photophysical studies on near infrared sensitive lanthanide doped $\text{Bi}_4\text{Ti}_3\text{O}_{12}$ phosphors, Shivam Dubey (2020), M.Sc. (Adm No. 18MS0006), Guided by Professor V. K. Rai at Department of Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2020).
11. A study and upconversion performance on Er^{3+} doped $\text{NaY}(\text{WO}_4)_2$ phosphor, Srishti Kashyap, B. Tech. Engineering Physics (Admission No.:17JE002873), Guided by Professor V. K. Rai at Department of Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2021).
12. Experimental Realization of Quantum Teleportation of Single and Two-qubit arbitrary states via Hypergraph state, Atmadev Rai (Admission NO; 19MS0020), M.Sc. Physics, Guided by Professor V. K. Rai at Department of Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2021).
13. Impact of non-lanthanide ions on the structural and luminescence properties of upconverting phosphors, Debojyoti Ray Chawdhury, M. Sc. Physics (Admission no:

- 19MS0032), Guided by Professor V. K. Rai at Department of Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2021).
14. Optoelectronic properties of materials, Shivam Agrwal, M. Sc. Physics (Admission no: 20MS0120), Guided by Professor V. K. Rai at Department of Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2022).
 15. Green upconversion emission in Er^{3+} doped $\text{NaY}(\text{MoO}_4)_2$ Phosphor under 980 nm excitation, Prakhar Mishra, M. Sc. Physics (Admission no: 21MS0099), Guided by Professor V. K. Rai at Department of Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2023).
 16. Optical spectroscopy of Tungstate based phosphor, Himanshi, M. Sc. Physics (Admission no: 21MS0058), Guided by Professor V. K. Rai at Department of Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2023).
 17. Preparation of machine learning model for predicting rock and mine using SONAR, Bugatha Harshith Sai, B. Tech. Engg. Physics (admission no. 20JE0280) Guided by Professor V. K. Rai at Department of Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2024).
 18. Green upconversion emission studies of Er^{3+} - Yb^{3+} codoped SrWO_4 phosphor, Morye Tanuja Dattaram, M. Sc. Physics (Admission no. 22MS0167) Guided by Professor V. K. Rai at Department of Physics, Indian Institute of Technology (Indian School of Mines), Dhanbad (2024).