

BIO DATA

Dr. RINA SINGH

Principal Scientist

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Areas of Interest: Plasmonics, Smart Materials, Nanocatalysts, Environmental Nanotechnology

Work Experience:

Grade/Post	From	To	Institute
Principal Scientist	07.03.2017	Till date	CSIR-Central Road Research Institute
Sr. Scientist	07.03.2013	06.03. 2017	CSIR-Central Road Research Institute
Scientist	07.03.2009	06.03.2013	CSIR-Central Road Research Institute
Jr. Scientist	19.10.2007	06.03.2009	CSIR-Central Road Research Institute
Jr. Scientist	07.03.2005	18.10.2007	CSIR-Central Fuel Research Institute

Educational Qualifications:

Degree	University	Year	Remarks
PhD (Physics)	Indian Institute of Technology Delhi	2008-2013	Synthesis and Plasmonic Properties of Aluminium based Nanocomposites
M. Tech (Material Science)	Indian Institute of Technology Banaras Hindu University	2004	Awarded President Gold Medal
MSc (Inorganic Chemistry)	Banaras Hindu University	2002	First division
BSc (PCM)	Banaras Hindu University	2000	First division

Membership to Professional Bodies:

1. Indian Roads Congress
2. Materials Research Society Singapore

Awards and Achievements:

- Biography selected for 'Who's Who in the World' 2016 (33rd Edition) and International Biographical Center (IBC), Cambridge University Award.
- Awarded third prize for the technical paper 'सिविल इंजीनियरिंग अनुप्रयोगों के लिए नैनो तकनीक'.
- Editor of STM Journals
 - International Journal of Polymer Science and Engineering.
 - International Journal of Composite and Constituents-Materials.
 - International Journal of Ceramics and Ceramic Technology.
 - International Journal of Composite Material and Matrices
 - Journal of Advances in Applied Physics (JAAP), ISAAC Scientific Publishing.
 - Advanced Physics Research Reports (The American Publishing House)
- Reviewer of SCI Journals: Journal of Nanoparticles Research, Material Chemistry Physics, Applied Physics A, Journal of colloid and Interface Science, RSC Advances, Current Nanoscience
- Member of DRC (Divisional Research Committee) of AcSIR Ph.D Students
- Awarded President Gold medal for standing first in M. Tech (Materials Science) from IIT BHU.
- GATE qualified in 2002
- Awarded Senior Research Fellow by UGC, Govt of India (2004-2005)

Research Projects:

Sl. No	Title of Project	Project Category	Participating Agencies	Your Role as defined
1	Pilot Study for the Development of Surface Enhanced Raman Scattering (SERS) based Sensors for the Detection of Environmental Pollutants (Air/Water/Soil)	OLP	CSIR-CRRI	Project leader Development of SERS sensors to monitor the toxic substances in air.

2	Study of Benzene and VOCs in Different Corridors of Delhi	OLP-455 R&D	In-house (Completed 2015)	Project Leader Objectives: to assess concentration of benzene in different locations such as petrol pumps, residential areas and other traffic road side corridors and to understand the relation of benzene with other pollutants such as NOx, and particulate matter with meteorological parameters
3	Studies of Non Methane Hydrocarbons in the Atmospheric Environment of Delhi Region	GAP 4478 R&D	DST Project	Team Member
4	Sustainable Ground Water Management: Assessment of Pollution Loads from Road runoff	12 th FYP Project (ESC 0306)	Network Project	Team Member Project proposed based on the needs of our society. The expected output of this project for XII FYP has both direct and indirect significance for the benefit of society

Research Papers Published in Scientific/ Referred Journals:

1. Deepa P, Meena Laad, Sangita, **Rina Singh** (2019), An overview of use of nanoadditives in enhancing the properties of pavement construction binder bitumen, World Journal of Engineering, DOI:10.1108/WJE-04-2018-0136)
2. **Rina Singh**, Manisha Gaur and Anuradha Shukla (2016) Seasonal and Spatial Variation of BTEX in Ambient Air of Delhi, Journal of Environmental Protection, 7, 670-688. doi: 10.4236/jep.2016.75060.
3. Manisha Gaur, **Rina Singh** and Anuradha Shukla (2016), Variability in the Levels of BTEX at a Pollution Hotspot in New Delhi, Journal of Environmental Protection, 07(10), 1245-1258.
4. Manisha Gaur, **Rina Singh** and Anuradha Shukla (2016), Volatile Organic Compounds in India: Concentration and Sources, Journal of Civil & Environmental Engineering, 6 (05), 251.

5. Kirti Bhandari, **Rina Singh**, Anuradha Shukla (2016), Site-Specific Variation Study of Particulate Matter with Traffic, Indian Journal of Air Pollution Control, (Vol XVI, No.2 & Vol XVII, No. I, pp 21 - 36
6. **Rina Singh** and R.K.Soni (2015) Synthesis of rattle-type Ag@Al₂O₃ nanostructure by laser-induced heating of Ag and Al nanoparticles, Applied Physics A, 121(1), 261-271. DOI: 10.1007/s00339-015-9429-0.
7. Vandana Tare, Sangita, Saurabh Bhargava, **Rina Singh** (2015) Rheological Properties and Storage Stability of EPE Modified Bitumen and EPE/montmorillonite Modified Bitumen, Indian Highways, 43 (12), 33-37.
8. **Rina Singh** & R.K.Soni (2014) Improved catalytic activity of laser generated bimetallic and trimetallic nanoparticles, Journal of Nanoscience and Nanotechnology, 14(9), 6872-6879.
9. **Rina Singh** & R.K.Soni (2014) Plasmonics Properties of Trimetallic Al@Al₂O₃@Ag@Au and Al@Al₂O₃@AuAg nanostructures, Applied Physics A, 116 (3), 955-967. DOI: 10.1007/s00339-014-8455-7.
10. **Rina Singh** & R.K.Soni (2014) Laser Generation of Aluminium Nanoparticles in Biocompatible Polymer Solution, Applied Physics A, 116(2), 689-701. DOI 10.1007/s00339-014-8487-z.
11. Sippy Kalra Chauhan, Anuradha Shukla, **Rina Singh**, Vikram Singh (2014) Source Apportionment for Lower Non methane hydrocarbons in the ambient air of Delhi – a mega city in India, Indian Journal of Environmental Protection, 34(8) 682 – 688.
12. **Rina Singh** & R.K.Soni (2012) Aluminium-Gold Nanocomposites Prepared by Pulsed Laser Ablation, Journal of Nanoscience letters, 3,11.

Hindi Publications:

1. **रीना सिंह**, नेहा चौधरी, अनुराधा शुक्ला (2017), सिविल इंजीनियरिंग अनुप्रयोगों के लिए नैनो तकनीक, Sadak Darpan, 15, 33-42
2. **रीना सिंह**, मनीषा गौर, अनुराधा शुक्ला (2016) दिल्ली की परिवेशी वायु में मौसमी और BTEX की स्थानिक विभिन्नता, Sadak Darpan, 13, 22-30

Conference Proceedings:

1. **Rina Singh** (2017), Hybridized Plasmon modes and Electric Field Enhancement around Plasmonic Nanostructures / Nanoshells: A Systematic Investigation for SERS sensing', Keynote Lecture, International Conference in Small Science (ICSS), San Sebastian, Spain, 9 to 13th May 2017. pp 38-39
2. Manisha Gaur, **Rina Singh** & Anuradha Shukla (2016). VOCs Concentration in an Area with Heterogeneous Traffic: A Pilot Study. Paper published in an International Conference on "Trends and Recent Advances in Civil Engineering" Amity University, Noida, 11 and 12th August 16. Amity University, Noida, pp, 36-40.
3. **Rina Singh** and R. K. Soni (2017), Laser Ablated Multimetallic Nanocomposites and their Morphological Analysis, Oral Paper presented for 'Asia-Pacific Congress on Catalysis (APCAT – 7)' International Conference, Institute of Chemical Technology (ICT), Mumbai, 17-21 Jan 2017.
4. **Rina Singh**, Dr. Sangita, Saurabh Bhargava & Vandana Tare (2016) 'Nanostructural Characteristics and Interfacial Properties of Nanoclays in Polymer Modified Bitumen Matrix', Abstract published in the proceedings of International Conference on Materials Science & Technology 2016, Delhi University, 1-3 March, DOI: 10.5185/icmtech.2016.
5. **Rina Singh** and R.K.Soni (2015) 'Effect of Polymer-Metal Particle Interaction on the Morphology of Aluminium Nanoparticles', Abstract Published in the Proceedings of International conference on Nanoscience and Nanotechnology 2015 (NANO-15), Centre for Nanoscience and Nanotechnology, KSR College of Engineering, 7-10th Dec 2015, Tamilnadu, India
6. **Rina Singh** and R.K.Soni (2015) 'Nucleation and Growth Kinetics in Laser Ablated Multimetallic Nanocomposites, Paper accepted for an oral talk in the International Conference on Materials of Advanced Technologies (ICMAT 2015), 28.06.2015 to 03.07.2015, Singapore, Symposium Z (Surfaces/Interfaces Modification by Molecules).
7. **Rina Singh** and R.K. Soni (2014) 'Bimetallic Nanocomposites for Surface Enhanced Raman Spectroscopy' Presented paper at an International conference 7th Bangalore INDIA NANO, 5 to 6 Dec 2014. The abstract has been published in the proceedings, pp-56.
8. **Rina Singh** and R.K. Soni (2014) 'Laser Assisted synthesis of Hollow Aluminium Micro/Nanoparticles in Polymer Matrix', Paper presented at an International Conference, Recent Advances in Nanoscience and Nanotechnology, JNU, 15th-16th, Dec 2014. The abstract has been published in the proceedings.

9. **Rina Singh** and R.K.Soni, 'Plasmonics Properties of Trimetallic Al@Al₂O₃@Ag@Au and Al@Al₂O₃@AuAg nanostructures', Abstract published in the proceedings of International Conference on Materials of Advanced Technologies (ICMAT), 29.06.2013 to 05.07.2013, Singapore, Symposium V, pp-174.
10. **Rina Singh** and R.K.Soni, 'The architecture of laser generated nanostructure and their catalytic activity', Abstract published in the proceedings of International Conference on Materials of Advanced Technologies (ICMAT), 29.06.2013 to 05.07.2013, Singapore, Symposium H, pp-84
11. **Rina Singh** & R.K.Soni, Bimetallic Al-Ag and Al-Au Nanocomposites for Surface Enhanced Raman Spectroscopy, International Conference on Nanoscience and Nanotechnology (ICAONSAT 2012), ARCI, Hyderabad, 20-23 Jan 2012.
12. **Rina Singh**, Naresh Kumar, Jyoti Katyal and R.K. Soni, 'Plasmonic Sensing of Oxidation in Aluminium Nanoparticles', Paper presented in International Conference and Workshop on Nanostructured Ceramics and other Nanomaterials (ICWNCN 2012), Delhi University, March 2012, p-110.
13. **Rina Singh** & R.K.Soni, Synthesis of Aluminium Nanoparticles in Polymer Matrix using Pulsed Laser Ablation in Liquid, 2nd International Conference on Laser Ablation and Nanoparticle Generation in Liquids (ANGEL 2012), 22nd-24th May, 2012, Sicily, Italy.
14. Navas MP, **Rina Singh**, and R.K.Soni, 'Laser generation of Zn-Al nanocomposites and their photocatalytic properties', Abstract published in the proceedings of International Conference on Materials Science and Technology (ICMST 2012) June 2012, Kerela, p-167.
15. **Rina Singh** & R.K.Soni, 'Aluminium-gold Nanocomposite in Polymer Matrix by Laser Irradiation', International Conference of Young researchers on Advanced Materials (ICYRAM 2012), 1-6 July 2012, Singapore.
16. **Rina Singh** and Jyoti Katyal, 'Plasmonic properties of aluminium nanoparticles', R.K. Soni, National Symposium on Pulsed Laser Deposition of Thin Films and Nanostructured Materials (PLD 2011), Nov 2011, IISc Bangalore, Invited paper, p-22.
17. **Rina Singh** and R.K. Soni, 'Aluminium-Gold Nanocomposites in PVP matrix Prepared by Pulsed Laser Ablation', National Symposium on Pulsed Laser Deposition of Thin Films and Nanostructured Materials (PLD 2011) Nov 2011, IISc Bangalore, p-70.
18. **Rina Singh** and R.K. Soni, 'Plasmonic properties of Aluminium nanoparticles', Abstract published in the proceedings of International conference on 'International Conference on Materials Advanced Technologies (ICMAT 2011), June 2011, Singapore, p-46.
19. **Rina Singh** and R.K. Soni, 'Hollow aluminium nanoparticle formation by pulsed laser ablation in solution', Paper presented at International Conference

on Current Development in Atomic and Molecular Physics (CDAMOP) Delhi University, December 2011,p-133.

20. **Rina Singh** and R.K. Soni, 'Studying Optical Properties of metallic nanoparticles for Surface Enhanced Raman Spectroscopy', Paper published in the proceedings of International conference on 'Nanomaterials and Nanotechnology (NANOCON-2010), October 2010.
21. **Rina Singh** and R.K. Soni, 'Plasmonic properties of Nanomaterials and Surface Enhanced Raman Spectroscopy', Paper published in the proceedings of International conference on 'Nanomaterials and Nanotechnology (NANO-2010), December 2010, McMillan Advanced Research Series, pp 81-86.

Book Chapters:

1. **Rina Singh** (2019), Understanding the role of hydration water and nano C-S-H colloids in concrete, Smart nanoconcretes and cement based materials: properties, modelling and application. June 2019 ISBN: 978-0-12-817854-6, Elsevier, Editor: Prof Tuan Anh Nguyen
2. **Rina Singh & R. K. Soni** (2018)' Laser-induced heating synthesis of hybrid nanoparticles, Noble Metal-Metal Oxide Hybrid Nanoparticles: Fundamentals and Applications (Micro & Nano Technology Books: Advanced Nanomaterials Series). Elsevier, Editor: Prof Tuan Anh Nguyen
3. **Rina Singh & R.K.Soni** (2010) ' Plasmonic properties of Nanomaterials and Surface Enhanced Raman Spectroscopy' in a book chapters under the category 'Energy and Environment' December 2010,Mc Milan Advance Research Series, pp 81-86
4. **Rina Singh & R.K. Soni** 'Hollow aluminium nanoparticle formation by pulsed laser ablation in solution' to be published in book chapter NAROSA series publications.

Magazine Articles:

1. **Rina Singh** (2018), Importance of Nanoscience in Pavement Engineering and Environment Sector, Nanodigest, 10 (4), 28-34.
2. **Rina Singh & Anuradha Shukla** (2011), Nanotech for Road Transport, September 2011, Nanodigest, 3, 4, 42-43

Invited Talks:

1. Invited talk on the topic 'Nanotechnology for Green Environment' Mini Symposium on International Women's Day organized by CSIR-CRRI at Acharya Narendra Dev College, Delhi University, 8th March 2019.
2. Keynote lecture for the paper entitled 'Hybridized Plasmon modes and Electric Field Enhancement around Plasmonic Nanostructures / Nanoshells: A Systematic Investigation for SERS sensing' International Conference in Small Science (ICSS), Spain, 9 to 13th May 2017.
3. Invited talk on the topic 'Emerging technologies: need of new skill in the field of nanotechnology in India' Indo-Global Skills Summit & Expo 2017 on Skills, Startups & Entrepreneurship and the Indo-Global Education Summit & Expo 2017 on Collaborations with Foreign Universities, for the session 'Skill Development Sessions'

Date: 11.11.2019

Dr. Rina Singh