

CURRICULUM VITAE



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PERSONAL INFORMATION

Date of Birth December 10, 1961
Residential Address A-2/246, Upper Ground Floor, Janakpuri,
New Delhi-110058, INDIA

EDUCATION

2002 **Ph.D.** Inhibition Effect of some Phosphonium Compounds on the corrosion of
Mild Steel in 1N Sulfuric Acid; **University of Delhi**, Delhi, INDIA
1985 **M.Phil.** Grand Canonical Monte Carlo Simulation Studies of Krypton Adsorbed on
Graphite; **University of Delhi**, Delhi, INDIA
1983 **M. Sc.** Major: Physical Chemistry; **University of Delhi**, Delhi, INDIA
1981 **B.Sc.** Major: Chemistry; Minor: Physics and Mathematics, **University of Delhi**,
Delhi, INDIA

PROFESSIONAL EXPERIANCE

- 2009-Present **Officer on Special Duty (Principal)**, Aditi Mahavidyalaya,
University of Delhi, Delhi-Auchandi Road, Bawana, Delhi-110039.
- 1990- 2009 **Reader**, Department of Chemistry, Kirorimal College,
University of Delhi, Delhi, INDIA
- 1999-2003 **Research Scholar**, c/o Prof. Gurmeet Singh, Department of Chemistry,
University of Delhi, Delhi, INDIA
- 1983-1985 **Research Scholar**, c/o Prof. H.C. Gaur, Department of Chemistry,
University of Delhi, Delhi, INDIA

AWARDS AND HONORS

- Recipient of “**National Scholarship**” by Govt. of NCT of Delhi in M.Sc.
- Recipient of **Junior Research Fellowship (JRF)** by CSIR
- Recipient of “**Dr. S. Radhakrishnan Award**”, 2012

LABORATORY AND ANALYTICAL SKILLS ACQUIRED

- Electrochemical Polarization
- Infra-red Spectroscopy
- Scanning Electron Microscopy
- Quantum Chemical Calculations

RESEARCH INTERESTS

- Surface Characterization Techniques
- Corrosion Testing Techniques.
- Synthesis and Characterization of nano- materials.
- Electro-deposition and thin film analysis.

ON GOING RESEARCH

- Developing newer formulations of inhibitors for the corrosion of mild steel in acidic media.
- Designing and engineering more efficient inhibitors.
- Studying structure-efficiency relationships of various inhibitors.

TEACHING ACTIVITIES (19Years)

Courses Taught at Undergraduate Colleges of Delhi University (1990-present)

- Electrochemical Cells
- Thermodynamics
- Quantum and Spectroscopy
- Phases and Phase Equilibria
- Chemical Kinetics
- Surface Chemistry
- Chemical Equilibrium and its applications to analytical techniques.

PROFESSIONAL ASSOCIATION

Society Membership

- Indian Society of Analytical Scientists (ISAS) LM1343.
- Society for Advancement of Electrochemical Science and Technology (SAEST) LF666.
- Association of Chemistry Teachers (ACT) LM No. 1347.
- American Association of Science and Technology (AASCIT)
- Indian Science Congress Association (ISCA) L23576

PUBLICATIONS

Refereed Publications (15)

1. Hemlata Vashisht, I. Bahadur, S. Kumar, **Kalpana Bhrara**, D. Ramjugernath and Gurmeet Singh, "Evaluation of Benzyl Triphenyl Phosphonium Chloride as Corrosion Inhibitor for Mild Steel in Phosphoric Acid", *International Journal Electrochemical Science*, 9, 2014, pp 2896 – 2911
ISSN 1452-3981; Impact Factor 3.729.
2. Meenakshi Gupta, **Kalpana Bhrara** and Gurmeet Singh, "N-Ethyl N-Hydroxyethyl Aniline (NENHEA) as Corrosion Inhibitor for Mild Steel in 0.5 M Sulfuric Acid, *Corrosão e Protecção de Materiais*, 31(1), 2012, pp 17-21.
ISSN 2182-6587.
3. **Kalpana Bhrara** and Gurmeet Singh, "Study of Corrosion of Mild Steel in Propyl Triphenyl Phosphonium Bromide/Sulfuric Acid Solution by Conventional Weight Loss and Electrochemical Methods, Available as preprint in *Journal of Corrosion Science and Engineering*, Vol. 11, preprint 2.
ISSN 1466-8858.
4. **Kalpana Bhrara**, Hansung Kim and Gurmeet Singh, "Inhibiting Effects of Butyl Triphenyl Phosphonium Bromide on corrosion of Mild Steel in 1N Sulfuric Acid Solution and its adsorption characteristics", *Corrosion Science*, 50(10), 2008, pp- 2747-2754.
ISSN 0010-938X; Impact Factor: 3.615.
5. Ramananda Singh, **Kalpana Bhrara** and Gurmeet Singh, "The Inhibitory Effect of Diethanolamine on Corrosion of Mild Steel in 0.5 M Sulphuric Acidic Medium", *Portugaliae Electrochimica Acta*, 26(6), 2008, pp-479-492.
ISSN 1647-1571.

6. Puja Singh, **Kalpna Bhrara** and Gurmeet Singh, “Adsorption and kinetic studies of L-leucine as an inhibitor on mild steel in acidic media”, *Applied Surface Science*, 254(18), 2008, pp 5927-5935.
ISSN: 0169-4332; Impact factor 2.112.
7. Namita Khandpur, Hansung Kim, **Kalpna Bhrara** and Gurmeet Singh, “Inhibition of mild Steel corrosion in sulfuric acid by Polyvinylpyrrolidone-iodine complex” *Indian Surface Finishing*, II(1), 2007, pp 118-126.
ISSN 0972-9364.
8. **Kalpna Bhrara** and Gurmeet Singh, “Effect of Ally Triphenyl Phosphonium Bromide on the electrochemical and corrosion behavior of Mild Steel in 1N Sulfuric Acid”, *Corrosion Engineering Science and Technology*, 42(2), 2007, pp 137-144.
Print ISSN 1478-422X; Online ISSN 1743-2782; Impact Factor 0.537.
9. **Kalpna Bhrara** and Gurmeet Singh, “The Inhibition of Corrosion of Mild Steel in 0.5M Sulfuric Acid Solution in the presence of Benzyl Triphenyl Phosphonium Bromide”, *Applied Surface Science*, 253(2), 2006, pp 846-853.
ISSN: 0169-4332; Impact factor 2.112.
10. **Kalpna Bhrara** and Gurmeet Singh, “Effect of Ally Triphenyl Phosphonium Bromide on the electrochemical and corrosion behavior of Mild Steel in 1N Sulfuric Acid”, *Surface Engineering: Proceedings of the 4th International Surface Engineering Congress (ISEC-2005), St. Paul, Minnesota, USA*, Editors: Mark J. Jackson and Waqar Ahmed, 2006, pp 223-230.
11. **Kalpna Bhrara** and Gurmeet Singh “Adsorption Kinetics of Benzyl Triphenyl Phosphonium Chloride on Mild Steel in 1N Sulfuric Acid”, *Surface Engineering*, 21(3), 2005, pp.165-171.
Print ISSN 0267-0844; Online ISSN 1743-2944; Impact Factor 1.545.

12. **Kalpana Bhrara** and Gurmeet Singh " Adsorption Kinetics of Benzyl Triphenyl Phosphonium Chloride on Mild Steel in 1N Sulfuric Acid", *Proceedings of International Convention on Surface Engineering (INCOSURF-2004), Bangalore, India*, Editors: A.K. Sharma and S. Venugopalan, 2004, pp.172-178.

13. C.K. Seth and **Kalpana Sharma** "Liquid-Liquid Equilibria: Effect of water on upper and lower consolute solution temperatures of glycerol and o-methoxy phenol", *Chemistry Education*, 9(3), 1993, pp 50-52.
ISSN: 0970-597X

14. C.K. Seth and **Kalpana Sharma** "A Digital Polarograph", *Chemistry Education*, 10(1), 1992, pp 49-51.
ISSN: 0970-597X

15. C.K. Seth and **Kalpana Sharma** " Use of Potentiometric Technique for the determination of equivalence point in micro-molar concentrations: A Theoretical Aspect", *Chemistry Education*, 9(2), 1992, pp 56-58.
ISSN: 0970-597X

Articles/Books Published (3)

1. **Kalpana Bhrara** and Gurmeet Singh, "End of Life Vehicles Directive", *Indian Surface Finishing*, IV(2), 2007, 127-132.
ISSN 0972-9364

2. **Kalpana Bhrara** and Gurmeet Singh, "Restriction on the use of Hazardous Substances Directive- International and National Scenario", *Indian Surface Finishing*, IV (2), 2007, 121-127.
ISSN 0972-9364

3. **Kalpana Bhrara** and Gurmeet Singh, “Effect of Allyl Triphenyl Phosphonium Bromide on Electrochemical and Corrosion Behaviour of Mild Steel in 0.5M Sulphuric Acid”, Available online from August 2, 2007.
http://www.redorbit.com/news/science/1020742/effect_of_allyl_triphenyl_phosphonium_bromide_on_electrochemical_and_corrosion/

Conference Presentations (II)

1. **Kalpana Bhrara** and Gurmeet Singh “Some Cost Effective and Green Inhibitors for Mild Steel in Sulphuric Acid Media”, **Second Indo-Italian Workshop on “Electrochemistry for Future Energy Solution”**, Department of Chemistry, University of Delhi, Delhi. Nov. 30- Dec. 3, 2011.
2. **Kalpana Bhrara** and Gurmeet Singh “Phosphonium Compounds as Environment Friendly Inhibitors for Mild Steel in Sulphuric Acid Media”, **First Indo-Italian Workshop on “Frontiers of Fundamental and Industrial Electrochemistry: A Challenge for a Better World”**, Department of Chemistry, University of Delhi and Embassy of Italy, August 30-31, 2010.
3. **Kalpana Bhrara** and Gurmeet Singh “Effect of Butyl Triphenyl Phosphonium Bromide on the Corrosion of Mild Steel in 0.5M Sulfuric Acid Solution”, **Professor Ram Chand Paul 5th Symposium on Recent Trends in Chemistry**, Department of Chemistry, Panjab University, Chandigarh, March 1-2, 2009.
4. **Kalpana Bhrara** and Gurmeet Singh “ Some Environment Friendly Inhibitors for Mild Steel in Sulphuric Acid Media”, Department of Materials Engineering systems, College of Engineering, Yonsei University, South Korea, May 7, 2008.
5. **Kalpana Bhrara** and Gurmeet Singh “Some Environment Friendly Inhibitors for Mild Steel in Sulphuric Acid Media”, **National Conference on Greener Aspects of Electrochemistry**, Jiwaji University, Gwalior, Dec. 7-9, 2007.

6. **Kalpana Bhrara** and Gurmeet Singh “Inhibiting Effects of Butyl Triphenyl Phosphonium Bromide on Corrosion of Mild Steel in 1N Sulfuric Acid Solution and Its Adsorption Characteristics”, **International Corrosion Engineering Conference 2007**, Seoul Education and Cultural Center, Seoul, Korea, May 20-24, 2007.
7. **Kalpana Bhrara** and Gurmeet Singh “The Inhibition of Corrosion of Mild Steel in 0.5M Sulfuric Acid Solution in the presence of Benzyl Triphenyl Phosphonium Bromide”, **National Symposium on New Challenges in Chemistry**, Guru Nanak Dev University, Amritsar, March 20-21, 2006.
8. **Kalpana Bhrara** and Gurmeet Singh "Effect of Allyl Triphenyl Phosphonium Bromide on electrochemical and corrosion behavior of mild Steel in 1N Sulfuric acid”, **International Exhibition and Conference on Surface Finishing(ISF-2006)**, Bombay Exhibition Center, Bombay, Feb. 2-4, 2006.
9. **Kalpana Bhrara** and Gurmeet Singh "Temperature kinetics and thermodynamic parameters of adsorption of Allyl Triphenyl Phosphonium Bromide on mild Steel in 1N Sulfuric acid” **National Conference on Thermodynamics of Chemical and Biological Systems (NCTCBS-2005)**, Guru Nanak Dev University, Amritsar, Punjab, INDIA, Dec. 28-30, 2005.
9. **Kalpana Bhrara** and Gurmeet Singh "Effect of Allyl Triphenyl Phosphonium Bromide on electrochemical and corrosion behavior of mild Steel in 1N Sulfuric acid” **4th International Surface Engineering Congress & Exposition and the 19th International Conference on Surface Modification Technologies(ISEC-SMT-2005)**, St. Paul, Minnesota, USA, Aug. 1-3, 2005.
10. **Kalpana Bhrara** and Gurmeet Singh “Adsorption Kinetics of Benzyl Triphenyl Phosphonium Chloride on Mild Steel in 1N Sulfuric Acid”, **International Conference on Surface Engineering (INCOSURF-2004)**, Bangalore, India, 2004.

OTHER EXPERIENCES

Educational(1991-1993)

Member/ Head – Chemistry group, Center of Science Education and Communication (CSEC), University of Delhi. The main focus of the group was to promote and upgrade Chemistry Education at undergraduate level. The emphasis was on:

1. Development and Fabrication of low cost electronic instruments.
2. Introduction of instrumentation and unconventional experiments in routine laboratory work.
3. Application of Personal Computer in Chemistry Education.

Research

1. **Principal Investigator** of the UGC funded major project entitled “Quantum Chemical calculations for rationalizing the selection of corrosion inhibitor”.
2. **Visiting Professor**, Department of Material Science at Yonsie University, Seoul, Korea from April 1, 2008 to May 31, 2008.
3. **Member Editorial Board** of Indian Surface Finishing, Technical Publication of Metal Finishers Association of India (MFAI)
4. **Reviewers Panel** for various International scientific journals.

Administrative

1. **OSD(Principal)** – Aditi Mahavidyalaya (University of Delhi), Bawana, August, 2009- Continuing.
2. **Member** – Apex Committee against sexual harassment of the University of Delhi, 2008-April, 2014
3. **Deputy Proctor**, University of Delhi, 2007-2010.
4. Convener/Member- **Standing Committee** for admission of the College.
5. Convener/Member- **Time-Table Committee** of the department/ College.
6. Member- **Purchase Committee** of the Department.

7. Member- **Courses of Committee** of the Department of Chemistry, University of Delhi.

Extra-Curricular

1. Staff Advisor – Drama Society of the College
2. Staff Advisor – Adventure club of the College
3. Member – Women Development Cell of the College

Conferences Attended/Organised (30)

1. Workshop on Foundation Course “***Science and Life***”, organized by Centre for Professional Development in Higher Education, University of Delhi, June 21-22, 2013.
2. The Academic Congress titled “***Enabling the Young: Redefining Education***”, organized by the University of Delhi, Sept. 6-7, 2012.
3. The UGC-ASC’s workshop on “***Academic Administration***”, organized by CPDHE, University of Delhi, August 23-25, 2012.
4. Second Indo-Italian Workshop on “***Electrochemistry for Future Energy Solutions***”, held at Conference Centre, University of Delhi and organized by Department of Chemistry, University of Delhi and Embassy of Italy, Nov 30-Dec 3, 2011.
5. First Indo-Italian Workshop on “***Frontiers of Fundamental and Industrial Electrochemistry: A Challenge for a Better World***”, held at Conference Centre, University of Delhi and organized by Department of Chemistry, University of Delhi and Embassy of Italy, August 30-31, 2010.
6. National Conference on “***Greener Aspects of Electrochemistry GAELEC-2007***”, held at Department of Chemistry, Jiwaji University, Gwalior, Dec. 7-9, 2007.

7. One day symposium on “***Application of Nuclear Magnetic Resonance to Materials and Medicine***” held at Department of Chemistry, Indian Institute of Technology, Delhi and organized by Indian Society for Analytical Scientists (ISAS), Nov. 21, 2006.
8. One day seminar on “***Second year Chemistry Course of the Restructured B.Sc. Programme***”, held at Department of Chemistry, University of Delhi, Delhi, Nov. 11, 2006.
9. National Conference on “***Women, Science and Society***”, held at WSDC, University of Delhi, Delhi, March 9-10, 2006.
10. International Symposium on “***Advances in Fingerprint Technology***”, held at Department of Chemistry, Khalsa College, University of Delhi, Delhi, Feb. 14-15, 2006.
11. One day seminar on “***Frontier Technology in Chemical, Biological and Horticulture Sciences***” held at Conference Centre, University of Delhi and organized by ISAS and Department of Chemistry, KM College, University of Delhi, Dec.20, 2005.
12. National Symposium on “***Emerging Areas of Forensic Science***”, held at Department of Chemistry, S.G.T.B. Khalsa College, University of Delhi, Delhi, Dec. 4-6, 2004.
13. National Seminar on “***Recent Trends in Chemistry***”, held at Department of Chemistry, Maitreyi College, University of Delhi, Delhi, Sept. 22-24, 2004.
14. National Conference on “***Chemistry in the Development of Newer Materials CDNM-2004***”, held at Department of Chemistry, Banaras Hindu University, Varanasi-221005, Feb. 23-24, 2004.

15. Seminar on “**Quality System, Mutual Recognition Arrangement and World Trade Organisation in Present Indian Scenario**”, held at National Physical Laboratory, New Delhi and organized by ISAC, Jan. 23, 2004.
16. Seminar on “**Latest Development and Application of X-ray Fluorescence Technique in Petrochemical Industry**”, held at Hotel Le-Meridian, New Delhi, and organized by ISAC, Jan. 23, 2004.
17. National Symposium on “**Biotechnology: Expanding Horizons**”, held at INSA Auditorium and organized by AND College, University of Delhi, Delhi, Oct. 17-18, 2003.
18. Conference on “**Women Scientist and Technologists: Role in National Development**”, held at Vigyan Bhawan and organized by DBT, Ministry of Science and Technology, March 8-9, 2003.
19. Seminar on “**Hyphenated Techniques for Chemical Analysis**” held at B.R. Ambedkar Centre for Biomedical Research, University of Delhi and organized by ISAC, April 25, 1998.
20. **Workshop on “**Experiments in Chemistry**” held at Centre for Science Education and Communication, University of Delhi, June 19-28, 1993.
21. **Workshop on “**Learning Chemistry via Experimentation**” held at Centre for Science Education and Communication (CSEC), University of Delhi, June 21-28, 1993.
22. **Workshop on “**Fabrication of Digital pH-meters and Conductivity Bridges**” held at S.G.T.B. Khalsa College, University of Delhi and organized by CSEC, Oct. 14-18, 1992.

23. **Workshop on “*Fabrication of Digital pH-meters and Conductivity Bridges*” held at Hansraj College, University of Delhi and organized by CSEC, Oct. 12-15, 1992.
24. **Workshop on “*Fabrication of Digital pH-meters and Thermostats*” held at Deshbandhu College, University of Delhi and organized by CSEC, Oct. 15-20, 1992.
25. **Workshop on “*Experiments of Chemistry Education*” held at Hansraj College, University of Delhi and organized by CSEC, April 6-10, 1992.
26. **Workshop on “*Fabrication of Digital Thermometer and Thermostats, Experiments and Use of PCs in simulating Experiments in Chemistry*” held at CSEC, University of Delhi, August 15-20, 1991.
27. **Workshop on “*Application of Personal Computers in Chemistry Education*” held at Department of Physics and Astrophysics, University of Delhi and organized by CSEC, Dec.30-1991-Jan3, 1992
28. . **Workshop on “*Evaluation of Self-Fabricated Instruments*” held at Maitreyi College, University of Delhi and organized by CSEC, Oct. 7-20, 1991.
29. **Workshop on “*Fabrication of Digital Thermometers and Thermostats, Experiments and Use of PCs in simulating experiments in Chemistry*” held at CSEC, University of Delhi, August 15-20, 1991.
30. **Workshop on “*Fabrication of Digital Thermometers and Thermostat*” held at S.G.T.B. Khalsa College, University of Delhi and organized by CSEC, April 11-16, 1991.

**** Acted as Resource Person**